PROJECT MANUAL

FOR:

Phase 1a Bond Improvements

At

Fox Lane High School
Fox Lane Middle School
Mount Kisco Elementary School
Bedford Village Elementary School
Bedford Hills Elementary School
West Patent Elementary School
Pound Ridge Elementary School

BEDFORD CENTRAL SCHOOL DISTRICT
TOWN OF BEDFORD, WESTCHESTER COUNTY

NEW YORK STATE EDUCATION DEPARTMENT NUMBER:

S.E.D. Nos.
66-01-02-06-0-003-021 (FLHS)
66-01-02-06-0-007-011 (FLMS)
66-01-02-06-0-006-015 (MKES)
66-01-02-06-0-002-016 (BVES)
66-01-02-06-0-004-020 (BHES)
66-01-02-06-0-009-014 (WPES)
66-01-02-06-0-001-016 (PRES)

B.B.S. PROJECT NUMBER:

22-225A (FLHS)
22-225B (FLMS)
22-225C (MKES)
22-225D (BVES)
22-225E (BHES)
22-225F (WPES)
22-225G (PRES)

DATE:

Bid Issue Date: February 2, 2023

BBS

ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS

244 EAST MAIN STREET
PATCHOGUE
NEW YORK 11772
T. 631.475.0349
F. 631.475.0361

(BRANCH CONTACT)
187 WOLF ROAD, SUITE 205
ALBANY
NEW YORK 12205
T. 518.621.7650
F. 518.621.7655

www.BBSARCHITECTURE.COM

ARCHITECTS CERTIFICATION

THE UNDERSIGNED CERTIFIES THAT TO THE BEST OF HIS KNOWLEDGE, INFORMATION, AND BELIEF, THE PLANS AND SPECIFICATIONS ARE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF THE NEW YORK STATE UNIFORM FIRE PREVENTION AND BUILDING CODE, THE NEW YORK STATE ENERGY CONSERVATION CONSTRUCTION CODE, THE CONSTRUCTION STANDARDS OF THE EDUCATION DEPARTMENT, NEW YORK STATE DEPARTMENT OF LABOR RULE 56, EPA AND AHERA REQUIREMENTS.

_____
Lawrence Salvesen, A.I.A. Lic. No. 020623

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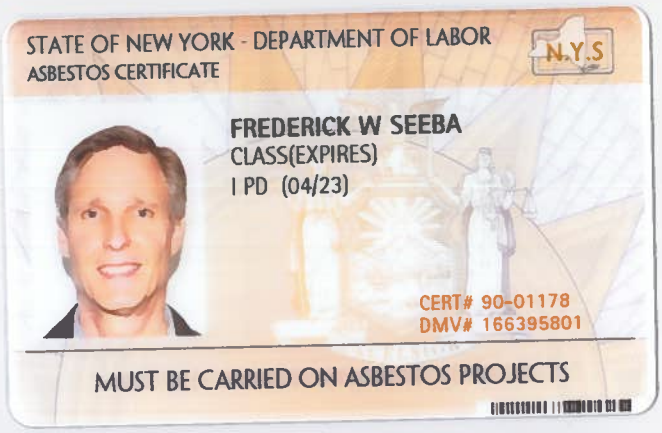
PROJECT DIRECTORY

Architects/Engineers:	BBS Architects, Landscape Architects and Engineers, P.C. 187 Wolf Road – suite 205 Albany, NY 12205 Telephone: (518) 621-7650
Superintendent of Schools:	Bedford Central School District Dr. Robert Glass rglass5100@bcsdny.org 632 South Bedford Road Bedford, New York 10506 Telephone (914)-241-6000
Business Official:	Bedford Central School District Thomas Cole tcole0206@bcsdny.org 632 South Bedford Road Bedford, New York 10506 Telephone: (914)-241-6018
Construction Manager:	Arris Contracting Company, Inc. John Patrick Jackson 189 Smith Street Poughkeepsie, NY 12601 Telephone: 845-473-3600


STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE
N.Y.S
FREDERICK W SEEBA
CLASS(EXPIRES)
I PD (04/23)
CERT# 90-01178
DMV# 166395801
MUST BE CARRIED ON ASBESTOS PROJECTS

New York State – Department of Labor
Division of Safety and Health
License and Certificate Unit
State Campus, Building 12
Albany, NY 12240

ASBESTOS HANDLING LICENSE

BBS Architects, Landscape Architects and Engineers P.C.

244 E Main Street

Patchogue, NY 11772

FILE NUMBER: 06-0559
LICENSE NUMBER: 28654
LICENSE CLASS: RESTRICTED
DATE OF ISSUE: 02/14/2022
EXPIRATION DATE: 02/28/2023

Duly Authorized Representative – Frederick Seeba:

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Amy Phillips, Director
For the Commissioner of Labor

SH 432 (8/12)

CONDITIONS OF THIS CONTRACT

A. Before attempting to deliver materials to the site, the Contractor shall inform the Owner's Representative so that arrangements can be made for places of entrance and inspection of materials being delivered.

B. The Contractor shall provide written guarantee of the complete installation to be free from defects in materials and workmanship in accordance with Section 01700. Any portion of the work judged inferior shall be replaced by the Contractor at no additional cost to the Owner.

C. The Contractor shall maintain operational exits, exit lights, danger signs, open trench markings, fire emergency equipment, night lights, and proper storage facilities for equipment and materials as directed through the length of the Contract.

D. The Contractor shall be totally responsible for general site clean up and removal of all materials and equipment related to this Contract at the end of the Contract.

E. The Contractor shall take over and maintain the site immediately after receiving the order to start work. Provide protection of property and utilities until work of the Contract is complete and accepted. The Contractor shall be responsible for the safety of any adjoining property, including paving, utility mains, pipes conduit, etc., and shall, at his own expense, protect and maintain same in at least as good a condition as that in which they were found.

F. All seeded areas, pavements, walks, curbs, and approaches shall be kept clear at all times and, if disturbed by this construction work, shall be repaired and restored with materials to match existing.

G. Before commencing any work, the Contractor shall verify all coverage, and conditions prevalent at the job sites. If no discrepancies are found, the contractor shall report all corrections in writing. If no corrections are brought to the attention of the School District and the Architect/Engineer before starting installation, the Contractor will be totally responsible for this installation providing complete coverage of the area designated.

H. Upon completion of the work, the Contractor shall furnish as-built drawings showing the exact locations of every new item.

I. It is assumed that Contractor's prices are based on scope of work complete and as confirmed by site(s) inspections prior to bidding.

J. Contractor shall be responsible for all incidental electric and plumbing work required to complete work under this Contract.

K. All repair and patching work shall be done in a professional manner. The Contractor shall take care to match new and existing surfaces and materials as closely as possible for a continuous finish where duplication is impossible.

L. Equivalents: Where, in these specifications, kinds, types, brands, or manufacturers of materials are named, they shall be regarded as the required standard of quality. Where two or more are named, these are presumed to be equal, and the Contractor may select one of those items.

If the Contractor desires to use any kind, type, brand, or manufacturer of material other than those named in the specifications as the basis of the bid, the Contractor shall indicate in writing with the bid, within 72 hours after the bid, or prior to award of contract, what kind, type, brand, or manufacturer is included in the base bid for the specified items, and submit information describing in specific detail wherein it differs from the quality and performance required by the base specifications and such other information as may be required by the Owner. The Contractor may, at any time, propose to use in the work an equivalent item in lieu of that specified with no change in the bid amount.

M. All prospective bidders shall be required to provide proof of demonstrated competence and experience in this type of work as outlined in these specifications, and each bidder must submit names and addresses of previous jobs completed by his firm, which involved the type of work outlined in the specifications. Bidders are required to complete the “Statement of Bidders Qualifications” form contained herein and submit it with their bids.

N. At least three letters of reference for this type of work completed in the last five years shall be provided upon request, with pertinent company names and addresses of the firms for which the work was done indicating type of work, scope of work, and complete work. The district has the right to verify these letters as well as examine other aspects of the bidder’s work record.

O. As is usual with capital project payments, the district will retain five percent of each payment issued on verified requisitions for payment submitted by the Contractor. This retainage total will be paid upon satisfactory completion of all the work.

P. The maximum gross weight of vehicles used shall not exceed 2,500 lbs. per wheel in the area of playgrounds and athletic fields. The equipment shall be equipped with flotation type tires. On the front lawns, the pounds per square inch exerted on the turf-grass shall not exceed 15 lbs. per square inch and on the back athletic area shall not exceed 32 lbs. per square inch.

Q. The Contractor shall be required to conform to all OSHA requirements regarding Lock-out/Tag-out procedures. This shall include, but not be limited to, disconnecting the power to any equipment to be serviced via a disconnect switch or breaker, locking out this power source, and tagging this lockout with appropriate wording as per OSHA requirements. This shall apply to any power source associated with this project.

R. Certificate of Occupancy: During construction, school district personnel shall monitor the occupied portion of any school building to assure that it complies with the minimum requirements necessary to maintain a Certificate of Occupancy.

S. Complaints: Boards of Education and BOCES shall follow procedures established under Section 155.4 (d) (7) for the investigation and disposition of complaints relating to health and safety received as a result of construction and maintenance activities.

T. Health and Safety Committee: Boards of Education and BOCES shall establish procedures for involvement of the health and safety committee to monitor safety during school construction projects.

U. Emergency Plan: The district emergency plan shall be updated to reflect any changes necessary to accommodate the construction process.

V. Fire Drills: Fire drills shall be held to familiarize students and staff with temporary exits and revised emergency procedures.

W. Notification: Boards of Education and BOCES shall establish procedures for notification of parents, staff, and the community in advance of a construction project of $10,000 or more.

X. Fire and Hazard Prevention: The following shall be strictly enforced:

1. During construction, daily inspection of district occupied areas shall be conducted by school district personnel to assure that construction materials, equipment, and debris do not block fire exist or emergency rescue windows.

2. Proper operation of fire extinguishers, fire alarm, and smoke/fire detection systems shall be maintained throughout the project.

Y. Radon: Districts shall take responsibility to be aware of the geological potential for high levels of radon and test and mitigate as appropriate.

Z. Post Construction Inspection: The school district or BOCES shall provide the opportunity for a walk-through inspection by the Health and Safety committee members to confirm that the area is ready for occupancy.

AA. Some of the proposed work may require various contractors to enter crawlspace or pipe tunnel areas, and/or access plenum spaces associated with the existing ceiling and wall systems (typical throughout). Please be advised that these spaces contain asbestos containing and/or asbestos contaminated materials. Any disturbance of said materials may result in the release of airborne asbestos fibers, therefore potentially creating a hazardous condition to the workers.

In accordance with 40 CFR Part 763, all contractors associated with this project are warned of the presence of the asbestos containing, and potentially asbestos contaminated materials within these spaces, and the potential hazard associated with the disturbance of these materials. Each contractor is required to have workers “certified and licensed to work in an asbestos hazard environment” to fulfill their contract requirements in these areas as part of their base bid. Per NYCRR 56, any person who may potentially disturb friable or non-friable asbestos during the course of any employment shall possess a valid restricted handler – allied trades certificate and shall have such certificate, or a copy thereof, in his or her possession at all times while working on the project. This person shall be aware of the health hazards of asbestos and take appropriate precautions to avoid any ACM, PACM or asbestos material disturbance throughout the course of their work. Abatement of any quantity of ACM, PACM or asbestos material is not allowed by this person under any circumstance.

The contractor shall notify the owners representative when work will be undertaken in these areas so that an independent monitoring firm can be available to monitor the activities within these spaces.

END OF SECTION

Invitation to Bidders

BOARD OF EDUCATION
Bedford Central School District

General Contractor (GC-1)
Mechanical Contractor Work (MC-2)
Electrical Contractor Work (EC-3)

PUBLIC NOTICE: is hereby given for separate contract sealed bids for: **Phase 1A Bond Improvements at, Fox Lane High School, Fox Lane Middle School, Mount Kisco Elementary School, Bedford Village Elementary School, Bedford Hills Elementary School, West Patent Elementary School, & Pound Ridge Elementary School.** Bids will be received by the School District, **February 28, 2023 at 3:30 p.m.** in the **Administration Building, 632 South Bedford Road, Bedford, NY 10506** and at said time and place publicly opened and read aloud.

The Contract Documents may be examined at the Office of the Architect, **BBS Architects, Landscape Architects and Engineers, P.C., 187 Wolf Road, Albany, New York, (518-621-7650);** however **t**he Contract Documents may only be obtained thru the Office of **REV, 330 Route 17A Suite #2, Goshen New York 10924 (877-272-0216)** beginning on **February 2, 2023.** Complete digital sets of Contract Documents shall be obtained online (with a free user account) as a download for a **non-refundable fee of Forty-Nine ($49.00) Dollars** at the following websites: www.bbsprojects.com or www.usinglesspaper.com under 'public projects'. Optionally, in lieu of digital copies, hard copies may be obtained directly from REV upon a **deposit of One Hundred ($100.00) Dollars** for each complete set. **Checks for deposits shall be made payable to the DISTRICT, BEDFORD CENTRAL SCHOOL DISTRICT** and may be uncertified. All bid addenda will be transmitted to registered plan holders via email and will be available at the above referenced websites. Any bidder requiring documents to be shipped shall make arrangements with the printer and pay for all packaging and shipping costs. Plan holders who have obtained hard copies of the bid documents will need to make the determination if hard copies of the addenda are required for their use, and coordinate directly with the printer for hard copies of addenda to be issued. There will be no charge for registered plan holders to obtain hard copies of the bid addenda. The bid deposit for hard copies will be returned upon receipt of plans and specifications, in good condition, within thirty days after bid date, except for the lowest responsible bidder, whose check will be forfeited upon the award of the contract.

The Contract will be awarded to the lowest responsible bidder or the proposals will be rejected within 45 days of the date of opening proposals. Bids shall be subject, however, to the discretionary right reserved by the School District to waive any informalities, accept or reject any alternatives, reject any proposals and to advertise for new proposals, if in its opinion the best interest of the School District will thereby be promoted.

Each bidder may not withdraw his bid within 45 days after the formal opening thereof. A bidder may withdraw his bid only in writing and prior to the bid opening date. A prebid walkthrough is scheduled for **February 14, 2023 at 3;30pm** at the High School North Entrance.

BY ORDER OF THE
BOARD OF EDUCATION
Bedford Central School District
Dated: January 30, 2023

DRAFT

AIA® Document A701™ – 2018

Instructions to Bidders

for the following Project:
(Name, location, and detailed description)

Bedford Central School District
632 South Bedford Rd
Bedford, NY 10506

THE OWNER:
(Name, legal status, address, and other information)

Bedford Central School District Phase 1A
632 South Bedford Rd
Bedford, NY 10506

THE ARCHITECT:
(Name, legal status, address, and other information)

BBS Architects, Landscape Architects & Engineers, P.C.
187 Wolf Rd Suite 205
Colonie, NY 12205

TABLE OF ARTICLES

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™–2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.

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ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents contained in the proposed project manual(s).

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents, apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents. Wherever the word "Bid" occurs in the Bidding Documents, it refers to the Bidder's proposal.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

.1 the Bidder has read and understands the Bidding Documents;

.2 the Bidder understands how the Bidding Documents relate to other portions of the Project being bid concurrently or presently under construction;

.3 the Bid complies with the Bidding Documents;

.4 The Bidder has visited the site, examined the site and all existing facilities where the Project work is to be done, conducted all tests required to verify Owner-provided information, made all reviews of publicly available documents concerning the Work, reviewed the study results finding asbestos and lead on the Project site, reviewed all available as-built drawings, become familiar with local conditions under which the Work is to be performed, reviewed the Bidding Documents, the proposed Contract Documents, and all Addenda, and has correlated the Bidder's personal observations with the requirements of the foregoing. The Bidder shall inspect accessible concealed areas of existing construction, provided no significant permanent damage is inflicted upon the Owner's property. Lack of knowledge about conditions in accessible concealed areas shall not be a basis for additional cost claims at a later time. By submitting a Bid, the Bidder verifies that all Owner-provided information in the Bidding Documents and proposed Contract Documents is accurate and the Bidder waives any claim based on inaccuracy in the Bidding Documents or proposed Contract Documents that should have been reasonably found in a thorough inspection and testing of the Project site and review of the proposed Contract Documents and publicly available information;

.5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and

.6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor and the General Conditions of the Contract for Construction.

§ 2.2 It is understood and agreed that the Bidder has, by careful examination, satisfied itself as to the nature and location of the Work, and confirmation of the ground, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the Work, the general and local conditions, and all other matters which can in any way affect the Work under the proposed Contract Documents.

§ 2.3 No official, officer or agent of the Owner is authorized to make any representations as to the materials or workmanship involved or the conditions to be encountered and the Bidder agrees that no such statement or the evidence of any documents or plans, not a part of the Bidding Documents, shall constitute any grounds for claim as to conditions encountered. No verbal agreement or conversation with any officer, agent or employee of the Owner either before or after the execution of this Contract shall affect or modify any of the terms or obligations herein contained.

§ 2.4 The Bidder acknowledges its understanding and agreement that it has informed itself fully as to the conditions relating to construction and labor under which the Work will be performed and agrees as far as possible to employ such methods and means in the performance of its work so as not to cause interruption or interference with any other contractor.

§ 2.5 The Bidder's attention has been directed to the fact that all applicable state laws, municipal ordinances, and rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Contract throughout, and they are deemed to be included in the Contract Documents the same as though herein written out in full. By submitting a Bid, the Bidder acknowledges that if awarded the Contract it shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the Work as drawn and specified in the Contract Documents. By submitting a Bid, the Bidder acknowledges that if awarded the Contract it shall be required to observe all laws and ordinances including, but not limited to, relating to the obstructing of streets, maintaining signals, keeping open passageways and protecting them where exposed to danger, and all general ordinances affecting it, its employees, or its work hereunder in its relations to the Owner or any person. By submitting a Bid, the Bidder acknowledges that if awarded the Contract it shall also obey all laws and ordinances controlling or limiting the Contractor while engaged in the prosecution of the Work under the Contract.

§ 2.6 The Bidder's attention has been directed to the fact that if the Contractor observes that the Drawings and Specifications are at variance with laws and regulations, it shall promptly notify the Architect in writing and any necessary changes shall be adjusted as provided in the Contract Documents for changes in the Work. By submitting a Bid, the Bidder acknowledges that if awarded the Contract and it performs any Work knowing it be contrary to such laws, ordinances, rules, regulations, or specifications, or local, state or federal authorities without such notice to the Architect, it shall bear all costs arising therefrom.

§ 2.7 The Bidder's attention is directed particularly to the Contract Documents provisions whereby the Contractor will be responsible for any loss or damage that may occur to the Work or any part thereof during its progress and whereby the Contractor must make good any defects or faults in the Work that may occur during the progress or within two (2) years after its acceptance. The Contractor shall provide for the continuation of the Performance Bond as a Maintenance Bond for two (2) full years after date of final payment request at the full Contract Sum. The Work is to be performed and completed to the satisfaction of the Owner & Architect and in accordance with the Specifications annexed hereto and the Drawings referred to therein.

§ 2.8 The Bidder's attention is directed to the fact that each Contractor shall pay not less than the minimum hourly wage rates on those contracts as established in accordance with Section 220 of the Labor Law as shown in the schedule included in the Bidding Documents. Article 8, Section 220 of the Labor Law, as amended by Chapter 750 of the Laws of 1956, provides (among other things) that it shall be the duty of the fiscal officer to make a determination of the schedule of wages to be paid to all laborers, workers and mechanics employed on public work projects, including supplements for welfare, pension, vacation and other benefits. These supplements include hospital, surgical or medical insurance, or benefits; life insurance or death benefits; accidental death or dismemberment insurance; and pension or retirement benefits. If the amount of supplements provided by the employer is less than the total supplements shown on the wage schedule, the difference shall be paid in cash to the employee. Article 8, Section 220 of the Labor Law, as amended by Chapter 750 of the Laws of 1956, also provides that the supplements to be provided to laborers, workers

and mechanics upon public work, "... shall be in accordance with the prevailing practices in the locality..." The amount for supplements listed on the enclosed schedule does not necessarily include all types of prevailing supplements in the locality, and a future determination of the Industrial Commissioner may require the Contractor to provide additional supplements. The original payrolls or transcripts shall be preserved for three (3) years from the completion of the Work on the awarded project by the Contractor. The Owner shall receive such payroll record upon completion of the Project.

§ 2.9 To be considered qualified, the Bidder must demonstrate to the Owner's satisfaction the following:

- **.1** The corporation, partnership, sole proprietorship of other business entity in whose name the Bid is submitted has been in business, continuously, for no less than the previous five (5) years performing or coordinating the work which it is bidding on;
- **.2** The Bidder has satisfactorily completed no less than five (5) projects of comparable size, complexity and type to this Project as a prime contractor to project owner;
- **.3** The bidder is not currently involved in bankruptcy proceedings;
- **.4** The Bidder is licensed to perform the work it is bidding on in the jurisdiction where the work will take place;
- **.5** The Bidder is capable of and intends to perform at least 25% of the Work with its own forces;
- **.6** The Bidder is able to perform the Work with the manpower available to it; and
- **.7** The Bidder and its subcontractors have a minimum of five (5) years' experience in the Work and applicable trades.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)

See Advertisement for Bids

§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

§ 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 It is the responsibility of the Bidder before submitting a Bid:

- **.1** To examine thoroughly the proposed Contract Documents and other related data identified in the Bidding Documents;
- **.2** To visit the site to become familiar with and satisfy Bidder as to the general, local and site conditions that may affect cost, progress, performance or furnishings of the Work;
- **.3** To consider federal, state and local laws and regulations that may affect cost, progress, performance or furnishing of the Work;
- **.4** To study and carefully correlate Bidder's knowledge and observations with the proposed Contract Documents and such other related data;
- **.5** To promptly notify the Architect, in writing, of all conflicts, errors, ambiguities or discrepancies that the Bidder has discovered in or between the proposed Contract Documents and such other related documents; and
- **.6** In the absence of an interpretation by the Architect, should the Drawings disagree in themselves or with

the Specifications, the better quality, the more costly or the greater quantity of work or materials shall be estimated upon, and unless otherwise determined, shall be furnished.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven (7) days prior to the date for receipt of Bids.
(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)

Gregory O'Connor-AIA Director, Architecture
Email: oconnor@bbsarch.com
BBS Architects, Landscape Architects & Engineers, P.C.
187 Wolf Rd Suite 205
Colonie, NY 12205

With a copy to:
Linda DiDonato
Email: ldidonato@arriscontracting.com
Arris Contracting Company, Inc.
189 Smith Street
Poughkeepsie, NY 12601

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. All Addenda so issued shall become part of the Contract Documents. If any Addenda may materially affect the bid, as solely determined by the Owner, the Owner may extend the Bid date. Interpretations, corrections and changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them. No oral interpretation will be made to any Bidder as to the meaning of the proposed Contract Documents or any part thereof. Every request for such an interpretation shall be made in writing to the Architect.

§ 3.3 Equivalents

§ 3.3.1 In the Specifications in the proposed Contract Documents, one or more kinds, types, brands, or manufacturers or materials are regarded as the required standard of quality and are presumed to be equal. The Bidder may select one of these items or, if the Bidder desires to use any kind type, brand, or manufacturer or material other than those named in the specifications, it shall indicate in writing when requested, and prior to the submittal of Bids, what kind, type, brand or manufacturer is included in the Base Bid for the specified item.

§ 3.3.2 Equivalents Process

§ 3.3.2.1 Written requests for equivalents shall be received by the Architect at least ten (10) days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit equivalents requests on a Request for Equivalent Review Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Request for Equivalent Review Form is not provided, requests shall include: (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed equivalent including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project certifications (such as LEED), that will result from incorporation of the proposed equivalent.

§ 3.3.3 The burden of proof of the merit of the proposed equivalent is upon the proposer. The Architect's decision of approval or disapproval of a proposed equivalent shall be final.

§ 3.3.4 If the Architect approves a proposed equivalent prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)

All Bid Addenda will be transmitted to registered plan holders via email and will be available at www.revplans.biddyhq.com.

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 – not used

§ 3.4.4 Prior to submitting a Bid, the Bidder shall ascertain that the it has received all Addenda issued, and the Bidder shall acknowledge receipt in the Bid. It shall be the Bidder's responsibility to make inquiry as to the existence of Addenda issued. All such Addenda shall become part of the Contract Documents and the Bidder shall be bound by such Addenda whether or not received by the Bidder.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents. Failure to use said forms or the inclusion of bids not requested shall result in rejection of the Bid. The Project Manual shall not be submitted or included in the Bidder's Bid package. No Bid will be considered which does not include bids for all items listed in the proposal sheets.

§ 4.1.2 All blanks on the Bid Form shall be legibly executed. Bid Forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on the Bid Form must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the Bid Form.

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the Bid Form nor qualify the Bid in any other manner.

§ 4.1.7 The Bidder must state in the Bid his/her full name and business address, and the full name of every person, firm or corporation interested therein and the address of every person or firm, or president and secretary of every corporation interested with it; if no other person, firm or corporation be so interested, it must affirmatively state such fact. The Bidder must also state that the Bid is made without any connection (directly or indirectly) with any other bidder for the work mentioned in its Bid and is (in all respects) without fraud or collusion; it has inspected the site of the Work and has examined the Bidding Documents; no person acting for or employed by the Owner is directly or indirectly interested therein, or in the supplies or Work to which it relates or in any portion of the prospective profits thereof; it proposes and agrees if its Bid is accepted, to execute a contract with the Owner to perform the work mentioned in the proposed Contract Documents attached; and the amount it will accept in full payment..

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.1.9 The Bidder shall execute, under the penalty of perjury, and submit with its Bid, an Iran Divestment Act of 2012 certification as required by General Municipal Law §103-g.

§ 4.1.10 As a condition of bidding, the Bidder certifies, warrants and represents that it is not disqualified to contract with municipal corporations or other public bodies as provided by the General Municipal Law of the State of New York, or as provided by any successor statute thereto. The Bidder further certifies that if it becomes a Contractor hereunder, any refusal by it, including the refusal of its officers, employees, servants or agents, when called before a grand jury, head of a state department, temporary state commission or other state agency, the organized crime task force in the department of law, head of a city department or other city agency, which is empowered to compel the attendance of witnesses and examine them under oath, to testify in an investigation concerning any transaction, or contract had with the state, any political subdivision thereof or of a public authority, to sign a waiver of immunity against subsequent criminal prosecution or to answer any relevant question concerning such transaction or contract, it or any firm, partnership or corporation of which it is a member, partner, director or officer shall be disqualified from selling to or submitting bids or proposals to or receiving awards from or entering into any contract with the Owner for a period of five years after such refusal; and any and all contracts made with the Owner on or after the first day of July, nineteen hundred and fifty nine by it and by any firm, partnership or corporation of which it is a member, partner, director or officer may be cancelled or terminated by the Owner without incurring any penalty or damages on account of such cancellation or termination, but any monies owing by the Owner for goods delivered or work done prior to the cancellation or termination shall be paid.

§ 4.1.11 The Bidder must verify its Bid in writing verifying that the several matters stated therein are in all respects true.

§ 4.1.12 The Owner may consider as informal any Bid on which there is an alteration of or departure from or additions to or qualification of the Bid Form or from the any of the other Contract Documents. The Owner may reject a Bid, which in the Owner's sole view, is not adequately filled out, or does not contain the requested information.

§ 4.1.13 It is the Bidder's responsibility to examine carefully the Drawings and Specifications, proposal and the site upon which the Work is to be performed. A proposal submitted shall be prima facie evidence that the Bidder has made such examination and that it is familiar with all of the conditions and requirements.

§ 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:
(Insert the form and amount of bid security.)

Either a certified check drawn on a solvent bank with an office in the State of New York, or a bid bond equal to five percent (5%) of the total amount of the Bid, and payable to the "Bedford Central School District." This amount shall be the measure of liquidated damages sustained by the Owner as a result of the failure, negligence or refusal of the Bidder to whom the Contract is awarded to execute and deliver the Contract. The Bid must also be accompanied by a certified statement that the bonding company meets or exceeds the requirements set forth in Article 11 of the General Conditions of the Contract for Construction in the proposed Contract Documents.

§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder; such bonds shall be in the amount of 100% of the Contract Sum. Should the Bidder refuse to enter into such Contract within 10 days after receipt of the Notice of Award or fail to timely furnish such bonds, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty.

§ 4.2.3 If a surety bond is provided as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or the Bidder has not been notified of the acceptance of its Bid, the Bidder may, beginning 45 days after the opening of Bids, withdraw its Bid and request the return of its bid security.

§ 4.3 Submission of Bids

§ 4.3.1 Each Bid submission shall be enclosed in a sealed opaque envelope. This envelope shall be clearly marked with the name of the Project, Bidder's name, the date of the Bid opening, and marked "**BID PROPOSAL**" in large lettering on the envelope and shall contain the following items:

- **.1** Certified check or Bid Bond in the amount totaling 5% of the Base Bid.
- **.2** Certified letter from its bonding company, indicating that they meet the criteria set forth in Article 11 of the General Conditions contained in the proposed Contract Documents.
- **.3** Certified letter that the company bidding this Project has been in business under the same name for a period of five years or longer, and is not currently disbarred from bidding or working on public works projects by the New York State Department of Labor.
- **.4** One (1) fully executed original and one (1) copy (marked "copy") of the following:
  - **.1** Proposal form.
  - **.2** Non-collusive form.
  - **.3** Hold Harmless Agreement.
  - **.4** Certification of Compliance with the Iran Divestment Act or Declaration of Bidder's Inability to Provide Certification of Compliance with the Iran Divestment Act.
  - **.5** Insurance Certification - each Bid must be accompanied by the Insurance Certification Form located in the Specifications. Failure to provide may result in the Owner finding the Bidder "nonresponsive" to the Bidding Documents.
  - **.6** Sexual Harassment Prevention Certification form.
- **.5** Bidder Qualifications
  - **.1** A description of its experience with at least five similar projects of comparative size, complexity and cost together with documentary evidence showing that said projects were completed to the owner's satisfaction and were completed in a timely fashion.
  - **.2** Documentation from five projects completed within the past five years, listing type and scope of work, names and addresses of owners and dates of contract completion, as well as the following information:
    - timeliness of performance of the work of the project.
    - evidence that the project was completed to the Owner's satisfaction.
    - whether any extensions of time were requested and if such requests were granted.
    - whether litigation and/or arbitration was commenced by either the Owner or the Bidder as a result of the work of the project completed by the Bidder.
    - whether any liens were filed on the project by subcontractors or material suppliers of the Bidder.
    - whether the Bidder was defaulted on the project by the owner.
    - whether the Bidder made any claims for extra work on the project, including whether said claim resulted in a change order.
  - **.3** Documentation evidencing the Bidder's financial responsibility and capability to produce and execute the Work of the Project within the time periods specified, including a certified financial statement.
  - **.4** Fully completed Statement of Bidder's Qualifications.
  - **.5** Fully completed list of subcontractors.

§ 4.3.2 Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

§ 4.3.3 Oral, telephonic, telegraphic, facsimile or other electronically transmitted bids will not be considered. Bids not exhibiting original signatures or seals will not be accepted as a responsive Bid.

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The

receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 A Bid may not be modified, withdrawn or canceled by the Bidder during the forty-five (45) day time period following the time and date designated for the receipt of bids and each Bidder so agrees in submitting a Bid. Beginning 45 days after the day of the opening of Bids, a Bidder may withdraw its Bid and request return of its bid security.

§ 4.4.4 Negligence on the part of the Bidder in preparing its Bid confers no right for the withdrawal of the Bid after it has been opened. If the Bidder claims to have made a material and substantial mistake in the preparation of its Bid, the Bidder shall deliver to the Owner a written notice describing in detail the nature of the mistake or error with documentary proof (including, but not limited to, bid worksheets, summary sheets and other bid related data requested of it) within twenty-four (24) hours after the opening of the Bids. Failure to deliver said notice and documentary evidence or proof within the specified time shall constitute a waiver of the Bidder's right to claim an error or mistake. Upon receipt of said notice and documentary evidence within the specified time period, the Owner shall determine if an excusable error or mistake has been made; and, if so, the Owner may permit the Bid to be withdrawn. The Owner's determination of whether a Bidder made an excusable error or mistake shall be conclusive on the Bidder, its Surety, and all those claiming rights under the Bidder.

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 Opening of Bids

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders. The Owner reserves the right to postpone the date and time of the opening of Bids at any time prior to the date and time listed in the Advertisement or Notice to Bidders.

§ 5.2 Rejection of Bids

§ 5.2.1 The Owner reserves the right to reject any or all Bids and to accept the proposal it deems in the best interest of the Owner. A Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete, nonresponsive or irregular is subject to rejection by the Owner.

§ 5.2.2 In order to qualify as a Contractor satisfactory to the Owner, the Bidder shall document to the satisfaction of the Owner that he has the skill and experience as well as the necessary facilities, ample financial resources, experienced staff and technical organization for the Work, and adequate laborers and equipment to do the Work in a satisfactory manner and within the time specified. The Bidder may be judged qualified only for the type of work in which it demonstrates competence. The Bidder must prove to the satisfaction of the Owner that it is reputable, reliable and responsible. The Owner may make any investigation it deems necessary to assure itself of the ability of the Bidder to perform the Work, and the Bidder shall furnish the Owner with all such additional information and data for this purpose as may be requested. In addition to the general reservation of rights to reject any and all bids, the Owner specifically reserves the right to reject any Bid of any Bidder if the evidence submitted by, or investigation of such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Contract Documents and to complete the Work contemplated therein.

§ 5.2.3 The Owner reserves unto itself the sole right to determine the lowest qualified and responsible Bidder. The Owner may make any investigation necessary to determine the ability of the Bidder to fulfill the Contract and the Bidder shall furnish the Owner with all such information for this purpose as the Owner may request. Without limiting the general rights which the Owner has to reject Bids, as herein before set forth, in determining the lowest responsible bidder, the following considerations in addition to those above mentioned shall be taken into account. In determining the responsibility of a Bidder for a public works contract, the Owner shall consider whether the Bidder:

.1 Maintains a permanent place of business;
.2 Has adequate plant and equipment to do the Work properly and expeditiously;
.3 Has the suitable financial ability to meet obligations required by the Work;
.4 Has appropriate technical ability and experience in institutional and commercial construction including

experience in municipal construction in New York State;

.5 Has performed Work of the same general type and the same scale called for under this Contract;

.6 Has previously failed to perform contracts properly or complete them on time;

.7 Is in a position to perform this Contract;

.8 Has habitually and without just cause neglected the payment of bills or otherwise disregarded its obligations to subcontractors, suppliers, or employees;

.9 Is eligible for full bonding capacity of its Contract;

.10 Has been in business as the corporation, partnership, sole proprietorship or other business entity, in whose name the bid is submitted, continuously, for no less than the previous five (5) years performing or coordinating the Work which it is bidding on;

.11 Is not currently involved in bankruptcy proceedings;

.12 Is licensed to perform the Work it is bidding on in the jurisdiction the work will take place;

.13 Is able to perform the work with manpower available to it;

.14 Will employ a field superintendent with at least five (5) years' experience as a working field superintendent and capable of communicating in fluent English;

.15 Has committed a willful violation of the New York State Prevailing Wage Laws within the last five years;

.16 Has committed violations of safety and/or training standards as evidenced by a pattern of OSHA violations or the existence of willful OSHA violations;

.17 Has committed any significant violation of the Worker's Compensation Law, including, but not limited to, the failure of the Bidder to provide proof of worker's compensation or disability benefits coverage;

.18 Has committed any criminal conduct involving violations of the Environmental Conservation Law or other federal or state environmental statutes of regulations;

.19 Has committed any criminal conduct concerning formation of, or any business association with, an allegedly false or fraudulent Women's or Minority Business Enterprise (W/MBE), or any denial, decertification, revocation or forfeiture of W/MBE status by New York State;

.20 Has been debarred by any agency of the U.S. Government; and

.21 Has engaged in other conduct of so serious or compelling a nature that it raises questions about the responsibility of the Bidder, including, but not limited to submission to the Owner of a false or misleading Statement of Bidder's Qualifications, or in some other form, in connection with a bid for or award of a contract.

§ 5.2.4 No bids will be accepted, and no Contract will be awarded to any employer, contractor, sub-contractor, or its successors, which have been debarred and deemed ineligible to submit a bid on or be awarded any public work contract or subcontract by the New York State Department of Labor – Bureau of Public Work, or the New York City Comptroller's Office.

§ 5.3 Acceptance of Bid (Award)

§ 5.3.1 It is the intent of the Owner to enter into separate Prime Contracts with the lowest responsive and responsible bidder, as those criteria are defined and interpreted under the laws of the State of New York regarding competitive bidding for public improvement projects, provided the Bids are submitted in accordance with the requirements of the Bidding Documents and do not exceed the funds available. The Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's own best interests.

§ 5.3.1.1 The Owner may consider informal any Bid not prepared and submitted in accordance with all provisions of the Bidding Documents.

§ 5.3.2 Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

§ 5.3.3 The acceptance of a Bid will be a notice in writing signed by a duly authorized representative of the Owner by either registered or certified mail sent within forty-five (45) after the Bids have been opened and no other act of the Owner shall constitute the acceptance of a Bid. The acceptance of a Bid shall bind the successful Bidder to execute the Contract as provided hereinafter. The rights and obligations provided for in the Contract shall become effective and binding upon the parties only with its formal execution by the successful Bidder and the Owner.

§ 5.3.4 Each Bidder to whom a contract is awarded, shall, at the office of the Fire District within ten (10) business days after the date of notification by either registered or certified mail of acceptance of its Bid furnish the required payment and performance bonds in an amount of 100% of the Contract Sum, and the required insurance as set forth in Article 11 of the General Conditions of the Contract for Construction, and sign the Contract for the Work for its performance and maintenance.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 Contractor's Qualification Statement

§ 6.1.1 The Owner shall have the right to take such steps as it deems necessary to determine the ability of the Bidder to perform its obligations under the Contract, and the Bidder shall furnish the Owner all such information and data for this purpose as the Owner may request. The right is reserved to reject any Bid where an investigation of the available evidence or information does not satisfy the Owner that the Bidder is qualified and capable to carry out properly the terms of the Contract. The issuing of Bid Documents and acceptance of the Bidder's payment by the Owner shall not be construed as pre-qualification of that Bidder. If the Bidder is later discovered to have misrepresented or provided false or incorrect information with regard to any material party of the information submitted to the Owner, including but not limited to information regarding experience, debarment, claims, lawsuits, arbitrations, mediations, finances, license, contract termination, the Owner reserves the right to reject the Bid of such Bidder and, if a construction contract has been awarded, it will become automatically voidable at the sole discretion and election of the Owner.

§ 6.1.2 Within forty-eight (48) hours after the Bids are opened, the three (3) apparent low Bidders for each Prime Contract must submit the required pre-award submittal package described below to the Construction Manager:

- **.1** Workforce and Work Plan – Provide a detailed written Work Plan which shall demonstrate the Contractor's understanding of overall Project scope and shall include, but not be limited, to the following:
  - **.1** Sequential listing of specific Project activities required to successfully complete the Work of the Contract Documents.
    - **.1** Include Schedule and list Critical Milestones;
    - **.2** Include phasing of the Work, if required.
    - **.3** Include listing of long lead items.
    - **.4** Statement that the Project can be completed in the established time.
  - **.2** Resumes for the Bidder's proposed supervisory staff, including qualifications for specialized expertise or any certification(s) required to perform the Work.
  - **.3** Any special coordination requirements with other trades.
  - **.4** Any special storage and staging requirements for construction materials.
  - **.5** Any other special requirements.
- **.2** Detailed Cost Estimate: A copy of a Detailed Cost Estimate outlined in CSI format.
- **.3** Copy of most recent financial statements from CPA.
- **.4** AIA A305 – Qualification Form.

§ 6.2 Owner's Financial Capability – Intentionally omitted

§ 6.3 Submittals

§ 6.3.1 After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

- **.1** a designation of the Work to be performed with the Bidder's own forces;
- **.2** names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
- **.3** names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder in writing if the Owner, Construction Manager or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option,

(1) withdraw the Bid or (2) submit an acceptable substitute person or entity. The Owner may accept the substituted person or entity in its sole discretion or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security shall not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 Bond Requirements

§ 7.1.1 The Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Refer to Article 11 of the AIA A232-2019 General Conditions of the Contract for Construction for requirements associated with such bonds.

§ 7.1.2 The cost of the performance and payment bonds shall be included in the Bid.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the penal sum of the payment and performance bonds shall be the amount of the Contract Sum.

§ 7.2 Time of Delivery and Form of Bonds

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than ten (10) days following the date of notice of award of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312-2010, Performance Bond and Payment Bond. Both bonds shall be written in the amount of the Contract Sum. The Bidder shall provide for the continuation of the Performance Bond for two (2) full years after date of final payment request at the full Contract Sum.

§ 7.2.2.1 The performance and payment bonds shall have as surety thereunder such surety company or companies as are acceptable to Treasury Department of the United States on Bonds given to the United States Government, are authorized to do business in the State of New York, and meet or exceed the requirements established in Article 11 of the General Conditions of the Contract for Construction. The premiums on such bonds shall be included in the Bid price.

§ 7.2.3 The bonds shall be dated as of the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A132-2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition, as modified.

FINAL REPORT OF ENVIRONMENTAL SERVICES

Performed at:

FOX LANE HIGH SCHOOL
SED SURVEY PROJECT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

Prepared for:

BEDFORD CENTRAL SCHOOL DISTRICT
Inspiring and Challenging Our Students

632 South Bedford Road
Bedford, NY 10506

Prepared by:

WSP USA Solutions, Inc.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
Tel. (914) 747-1120

Project No. 31405320.011
Final Submission Date: September 16, 2022

September 16, 2022

Mr. Dennis Rankin
Director of Facilities
Bedford Central School District
632 South Bedford Road
Bedford, NY 10506

Subject: **Final Report of Environmental Services**
SED Survey Project
Fox Lane High School
632 South Bedford Road
Bedford, NY 10506

Dear Mr. Rankin:

WSP USA Solutions, Inc. has completed a material inspection at Fox Lane High School located at 632 South Bedford Road, Bedford, NY 10506. The inspection included visual observation, material sampling, and laboratory sample analysis of suspect Asbestos-Containing Materials (ACM), Lead Based Paints (LBP) and Polychlorinated Biphenyls (PCBs) as part of the SED Survey project at the Fox lane High School.

The attached report presents descriptions and results of the material sampling procedures and visual analysis. Relevant general project information is provided, followed by our findings, assessments and recommendations. Laboratory analysis data and certifications are provided in the Appendices.

If you have any questions concerning this report or if we may be of further assistance to you, please contact us.

Sincerely,

WSP USA SOLUTIONS, INC.

Steven Eget, PE
Vice President, Earth & Environment Downstate NY Business Line Leader

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Appendices

1.0 EXECUTIVE SUMMARY

WSP USA Solutions, Inc. has performed a material inspection for the presence or absence of Asbestos-Containing Materials (ACM), Lead Based Paints (LBP) and Polychlorinated Biphenyls (PCBs) at the Fox Lane High School located at 632 South Bedford Road, Bedford, NY 10506. The intent of this inspection was to screen for ACM, LBP and PCBs that may be impacted during the SED Survey project at the school noted above.

Alex Smolyar, Dmitri Kirnossenko and Josue Garcia of WSP performed this inspection on August 24, 2022. Mr. Smolyar is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert#12-07624) and a licensed New York State EPA as a Lead Risk Assessor (Cert# LBP-R-129050-2). Mr. Kirnossenko is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert#07-01720) and a licensed New York State EPA as a Lead Inspector (Cert# LBP-I-16279-2). Mr. Garcia is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert#01-04292) and a licensed New York State EPA as a Lead Risk Assessor (Cert# LBP-R-6928-2).

The results of the visual inspection and bulk sample analysis determined that the following suspect ACM, LBP and PCB materials may be impacted by the proposed SED Survey project at the school noted above:

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 08/24/2022 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **None**

The following materials **Contain Asbestos as per AHERA Report:**

- **Floor Tiles & Mastic - Not Affected by Current SOW**

Analytical results of the bulk samples collected on 08/24/2022 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- 12”x12” Floor Tile (White w/Brown Specs) - (Interior)
- Mastic to 12”x12” Floor Tile White w/Brown Specs - (Interior)
- Exterior Stucco (Gray) - (Exterior)
- Wall Plaster (Brown) - (Interior)
- Wall Plaster (White) - (Interior)
- 6” Cove Base (Gray) - (Interior)
- Glue to 6” Cove Base (Yellow) - (Interior)
- Glazed Block Mortar (Tan) - (Interior)
- Exterior Brick Mortar (Gray) - (Exterior)
- Interior Brick Mortar (Gray) - (Interior)
- Carpet Glue (Yellow/Gray) - (Interior)

- Mortar under Door Saddle (Gray) - (Interior)
- Ceramic Baseboard Backing/Glue (Gray) - (Interior)
- Ceramic Floor Tile Mortar - (Interior)
- 12”x12” Floor Tile (Pink) - (Interior)
- Mastic to 12”x12” Floor Pink Tile (Black) - (Interior)
- Exterior Brick Mortar (Red) - (Exterior)
- 2’x2’ Pinhole Ceiling Tile (Gray) - (Interior)
- 2’x4’ Ceiling Tile (Gray) - (Interior)
- Glazed Block Mortar (Gray) - (Interior)
- Gypsum Board (Gray) - (Interior)
- Joint Compound (White) - (Interior)
- Leveling/Mastic at Door (Black/Gray) - (Interior)
- 24”x24” Floor Tile (Gray) - (Interior)
- Mastic to 24”x24” Floor Tile (Black) - (Interior)
- 12”x12” Floor Tile (Gray, Green Specs) - (Interior)
- Mastic 12”x12” Floor Tile (Black) - (Interior)
- Cinderblock Mortar (Gray) - (Interior)
- Baseboard (Light Brown) - (Interior)
- Glue to Baseboard (Yellow) - (Interior)
- Asphalt (Black) - (Tennis Court)
- Green Coating - (Tennis Court)
- White Coating - (Tennis Court)
- Red Coating - (Tennis Court)
- Exterior Expansion Joint Caulking Sidewalk/Saddle (Gray) - (Exterior)
- Interior Door Frame Caulking (Gray) - (Interior)
- Interior Door Frame Caulking (White) - (Interior)
- Exterior Door Frame Caulking (Gray) - (Exterior)
- Exterior Door Frame Caulking (Red) - (Exterior)

B. LEAD-BASED PAINT

Based upon XRF readings, lead has been confirmed to exist in the following tested combinations:

- **Green Paint on Metal Door Lintel (Cold Storage 21E)**

Lead was **not detected** in the following tested combinations via XRF readings:

- Beige Paint on Gypsum Wall (Corridor 1DA)
- Gray Paint on Metal Door Frame (Corridor 1DA)
- Gray/Beige Paint on Cinderblock Wall (Corridor 1DA)
- Beige Paint on Metal Exterior Door Frame (Corridor 1DA)
- Beige Paint on Metal Exterior Door (Corridor 1DA)
- Beige Paint on Gypsum Wall (Room A101)

- Beige Paint on Vinyl Baseboard (Room A101)
- Beige Paint on Metal Door (Corridor 1F)
- Purple Paint on Metal Door Frame (Corridor 1F)
- Beige Paint on Metal Exterior Lintel (Band 85)
- Purple Paint on Metal Door (Band 85)
- Beige Paint on Plaster Wall (Corridor 1E)
- Green Paint on Metal Door (Cold Storage 21E)
- Green Paint on Cinderblock Wall (Cold Storage 21E)
- Brown/ Beige Paint on Gypsum Wall (Corridor X1B)
- Gray Paint on Metal Door (Corridor 1K)
- Gray Paint on Metal Door Frame (Corridor 1K)
- Gray Paint on Metal Door Lintel (Corridor 1K)
- Red Paint on Metal Door (Library)
- Red Paint on Wall (Fitness Room)
- White Paint on Wall (Room 202)
- Varnish Paint on Wood Door (Room 202)
- Gray Paint on Metal Door Frame (Room 202)
- Brown Paint on Ceramic Tile Wall (Room 202)
- Gray Paint on Metal Door Frame (Room 202)
- Varnish Paint on Wood Door (Room 202)
- Green Paint on Gypsum Wall (Hallway 2A)
- Beige/ Brown Paint on Gypsum Wall (Hallway 2A)
- Tan Paint on Cinderblock Wall (Girls Bath)

C. PCB-CONTAINING MATERIAL

Analytical results of the bulk samples collected indicate that the following materials **contain PCB** (greater than 50 PPM):

- **None**

Analytical results of the bulk samples collected indicate that the following materials **did not contain PCB** (less than 50 PPM):

- Exterior Floor Expansion Joint Caulking Sidewalk/Saddle (Gray)
- Interior Door Frame Caulking (Gray)
- Interior Door Frame Caulking (White)
- Exterior Door Frame Caulking (Gray)
- Exterior Door Frame Caulking (Red)
- Exterior Door Silicone (White/Clear)

2.0 FIELD INSPECTION PROCEDURES AND SAMPLE ANALYSIS METHODS

A. ASBESTOS-CONTAINING MATERIAL

Guidelines used for the inspection were established by the Environmental Protection Agency (EPA) in the Guidance for Controlling Asbestos Containing Materials in Buildings, Office of Pesticides and Toxic Substances, Doc 560/5-85-024, and 40 CFR Part 763, Asbestos Hazard Emergency Response Act (AHERA).

Field information was organized in accordance with the AHERA methodology of homogenous area (HA). During the Inspection, reasonable effort was made to identify all locations and types of ACM materials associated with the scope of work. Sampling has included multiple samples of the same materials chosen at random. However, due to inconsistencies of a manufacturer's processes and the contractor's installation methods, materials of similar construction may contain various amounts of asbestos. Furthermore, some materials that were not originally specified to contain asbestos may in fact contain this mineral. For example, cementitious pipe insulation and plaster were frequently mixed with asbestos at the construction site for ease of application. Locating all asbestos materials can only be definitively achieved by conducting exploratory demolition and sampling every section of pipe insulation, fitting or valve covering, fireproofing, and other suspect ACM.

Bulk samples of suspect ACM are analyzed using polarized light microscopy (PLM) coupled with dispersion staining, as described in 40 CFR Part 763 and the National Emissions Standard for Hazardous Air Pollutants (NESHAPS). NESHAPS is the standard industry protocol for the determination of asbestos in building materials. A suspect material is immersed in a solution of known refractive index and subjected to illumination by polarized light. The color displays that result are compared to a standardized atlas whereby the specific variety of asbestos is determined. It should also be recognized that PLM is primarily a qualitative identification method whereby asbestos percentage, if any, is estimated. While EPA, New York State, and New York City regulations governing ACM consider materials containing greater then 1-percent as asbestos, accurately quantifying asbestos content below 5-percent has been shown to be unreliable.

The New York State Department of Health has recently revised the PLM Stratified Point Counting Method. The March 25th, 2011 method, "Polarized Light Microscopy Methods for Identifying and Quantifying Asbestos in Bulk Samples" can be found as Item 198.1 in the Environmental Laboratory Approval program (ELAP) Certification manual. Whereas the procedure of analysis for bulk samples that fall into the category of "Non-friable Organically Bound" (NOB) can be found in the March 25th 2011 method "Polarized-Light Microscope Method for Identifying and Quantifying Asbestos in Non-Friable Organically Bound Bulk Samples", Item 198.6 in the ELAP Certification Manual. This category includes any sample in a flexible to rigid asphalt or vinyl matrix (floor tiles, mastic, roofing shingles, roofing felt, etc.). These samples must be "ashed" in a muffle furnace at 480-degrees Celsius (to remove organic matrix), treated with acid (to remove any mineral carbonate), and filtered through a 0.4-micron polycarbonate filter before being analyzed by PLM. The sample must be weighted between each of these steps to track the percent loss of organic matrix.

ELAP has determined that analysis of NOB materials is not reliably performed by PLM. Therefore, if PLM analysis yields results of 1-percent asbestos or less, the result must be confirmed by TEM. For bulk samples that undergo TEM analysis, the March 25th, 2011 method "Transmission Electron Microscope Method for Identifying and Quantitating Asbestos in Non-Friable organically Bound Bulk Samples" must be used and can be found as Item 198.4 in the ELAP Certification Manual. ELAP certified laboratories must include the following statement with their PLM analysis results for each "negative" (1-percent or less asbestos) NOB sample: "Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Before this material can be considered or treated as non-ACM, confirmation must be made by quantitative transmission electron microscopy".

All samples are initially analyzed by Polarized Light Microscopy in accordance with Item 198.1 and 198.6 of the ELAP Certification Manual. Samples which yield a negative PLM result and which are classified as a "non-friable" material, are then re-analyzed utilizing TEM methodology in accordance with Item 198.4 of the ELAP Certification Manual. The laboratory performing both these analysis procedures Atlas Environmental Lab, Corp. located at 255 West 36th Street, New York, NY 10018. The laboratory has received accreditation from the following agencies:

- National Voluntary Laboratory Accreditation Program (Lab Code 500092-0)
- New York State Environmental Laboratory Approval Program (Lab No. 11999)
- American Industrial Hygiene Association Accredited Laboratory (Lab No. 208306)

B. LEAD-BASED PAINT

Painted surfaces within the space equivalents in the scope of work were identified and grouped together by component type, substrate and visible color. In similar fashion, the inspection continued in each space equivalent with the identification of unique combinations of component, substrate and visible color. A random representative area of each unique combination was sampled and tested. For each of these designated components, an area on the component was chosen which represents the paint on that building component. During the inspection, components that are accessible surfaces, friction surfaces, impact surfaces, or have deteriorated paint was identified.

The readings of paint surfaces were taken using Heuresis Pb200i and RMD LPA-1 XRF Lead Paint Spectrum Analyzers. The Heuresis and LPA-1 method of measurement is based on the spectrometric analysis of lead K-shell X-ray fluorescence within a controlled depth of interrogation. The Heuresis and LPA-1 Analyzers uses a Co-57 radioactive source and an advanced, solid-state, room temperature, radiation detector to generate and detect the x-ray fluorescence spectrum of a painted surface. The spectrum is then analyzed by a microprocessor to eliminate the effects of substrate and other factors such as scattering to allow an accurate determination of the amount of lead on a surface. The Heuresis and LPA-1 automatically analyzes spectrometric data in real time and differentiates the lead signal from the spectrum. The x-ray fluorescence properties are determined through calibration process and are used for automatic substrate correction and calculation of the lead content of a painted surface.

For quality control, the XRF instrument was calibrated using a U.S. Department of Commerce National Institute of Standards and Technology (NIST) Level III 1.0 mg/cm2 lead based paint film. For each calibration, three (3) XRF readings were taken on the paint film. The average of these three (3) readings was then subtracted from the known lead content in the paint film. The difference was compared with an Environmental Protection Agency (EPA)-approved tolerance range. Such calibration procedures were conducted at the start and at the end of the workday

C. POLYCHLORINATED BIPHENYLS (PCBs)

PCBs belong to a broad family of man-made organic chemicals known as chlorinated hydrocarbons. PCBs were domestically manufactured from 1929 until their manufacture was banned in 1979. They have a range of toxicity and vary in consistency from thin, light-colored liquids to yellow or black waxy solids. Due to their non-flammability, chemical stability, high boiling point, and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics, and rubber products; in pigments, dyes, and carbonless copy paper; and many other industrial applications.

Although no longer commercially produced in the United States, PCBs may be present in products and materials produced before the 1979 PCB ban. Products that may contain PCBs include: Transformers and capacitors, Oil used in motors and hydraulic systems, Fluorescent light ballasts, Adhesives and tapes, Caulking, Plastics, etc.

The PCBs used in these products were chemical mixtures made up of a variety of individual chlorinated biphenyl components, known as congeners. Most commercial PCB mixtures are known in the United States by their industrial trade names. The most common trade name is aroclor.

Polychlorinated biphenyls (PCBs) are regulated pursuant to the United States Environmental Protection Agency Code of Federal Regulations (40 CFR Part 761) and the Toxic Substances Control Act (TSCA – 15 U.S.C. 2605). These regulations require certain testing and reporting requirements to determine management, recycling and disposal options for PCBs.

3.0 INSPECTION SCOPE AND MATERIAL ASSESSMENT

The areas inspected for ACM materials that may be impacted by the proposed SED Survey project at the Fox Lane High School. Locations surveyed include:

- Throughout Building

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 08/24/2022 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **None**

The following materials **Contain Asbestos as per AHERA Report:**

- **Floor Tiles & Mastic - Not Affected by Current SOW**

Analytical results of the bulk samples collected on 08/24/2022 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- 12”x12” Floor Tile (White w/Brown Specs) - (Interior)
- Mastic to 12”x12” Floor Tile White w/Brown Specs - (Interior)
- Exterior Stucco (Gray) - (Exterior)
- Wall Plaster (Brown) - (Interior)
- Wall Plaster (White) - (Interior)
- 6” Cove Base (Gray) - (Interior)
- Glue to 6” Cove Base (Yellow) - (Interior)
- Glazed Block Mortar (Tan) - (Interior)
- Exterior Brick Mortar (Gray) - (Exterior)
- Interior Brick Mortar (Gray) - (Interior)
- Carpet Glue (Yellow/Gray) - (Interior)
- Mortar under Door Saddle (Gray) - (Interior)
- Ceramic Baseboard Backing/Glue (Gray) - (Interior)
- Ceramic Floor Tile Mortar - (Interior)
- 12”x12” Floor Tile (Pink) - (Interior)
- Mastic to 12”x12” Floor Pink Tile (Black) - (Interior)
- Exterior Brick Mortar (Red) - (Exterior)
- 2’x2’ Pinhole Ceiling Tile (Gray) - (Interior)
- 2’x4’ Ceiling Tile (Gray) - (Interior)
- Glazed Block Mortar (Gray) - (Interior)
- Gypsum Board (Gray) - (Interior)
- Joint Compound (White) - (Interior)
- Leveling/Mastic at Door (Black/Gray) - (Interior)
- 24”x24” Floor Tile (Gray) - (Interior)
- Mastic to 24”x24” Floor Tile (Black) - (Interior)
- 12”x12” Floor Tile (Gray, Green Specs) - (Interior)
- Mastic 12”x12” Floor Tile (Black) - (Interior)
- Cinderblock Mortar (Gray) - (Interior)
- Baseboard (Light Brown) - (Interior)
- Glue to Baseboard (Yellow) - (Interior)
- Asphalt (Black) - (Tennis Court)
- Green Coating - (Tennis Court)
- White Coating - (Tennis Court)
- Red Coating - (Tennis Court)
- Exterior Expansion Joint Caulking Sidewalk/Saddle (Gray) - (Exterior)
- Interior Door Frame Caulking (Gray) - (Interior)
- Interior Door Frame Caulking (White) - (Interior)

- Exterior Door Frame Caulking (Gray) - (Exterior)
- Exterior Door Frame Caulking (Red) - (Exterior)

D. LEAD-BASED PAINT

Based upon XRF readings, lead has been confirmed to exist in the following tested combinations:

- **Green Paint on Metal Door Lintel (Cold Storage 21E)**

Lead was **not detected** in the following tested combinations via XRF readings:

- Beige Paint on Gypsum Wall (Corridor 1DA)
- Gray Paint on Metal Door Frame (Corridor 1DA)
- Gray/Beige Paint on Cinderblock Wall (Corridor 1DA)
- Beige Paint on Metal Exterior Door Frame (Corridor 1DA)
- Beige Paint on Metal Exterior Door (Corridor 1DA)
- Beige Paint on Gypsum Wall (Room A101)
- Beige Paint on Vinyl Baseboard (Room A101)
- Beige Paint on Metal Door (Corridor 1F)
- Purple Paint on Metal Door Frame (Corridor 1F)
- Beige Paint on Metal Exterior Lintel (Band 85)
- Purple Paint on Metal Door (Band 85)
- Beige Paint on Plaster Wall (Corridor 1E)
- Green Paint on Metal Door (Cold Storage 21E)
- Green Paint on Cinderblock Wall (Cold Storage 21E)
- Brown/ Beige Paint on Gypsum Wall (Corridor X1B)
- Gray Paint on Metal Door (Corridor 1K)
- Gray Paint on Metal Door Frame (Corridor 1K)
- Gray Paint on Metal Door Lintel (Corridor 1K)
- Red Paint on Metal Door (Library)
- Red Paint on Wall (Fitness Room)
- White Paint on Wall (Room 202)
- Varnish Paint on Wood Door (Room 202)
- Gray Paint on Metal Door Frame (Room 202)
- Brown Paint on Ceramic Tile Wall (Room 202)
- Gray Paint on Metal Door Frame (Room 202)
- Varnish Paint on Wood Door (Room 202)
- Green Paint on Gypsum Wall (Hallway 2A)
- Beige/ Brown Paint on Gypsum Wall (Hallway 2A)
- Tan Paint on Cinderblock Wall (Girls Bath)

E. PCB-CONTAINING MATERIAL

Analytical results of the bulk samples collected indicate that the following materials **contain PCB** (greater than 50 PPM):

- **None**

Analytical results of the bulk samples collected indicate that the following materials **did not contain PCB** (less than 50 PPM):

- Exterior Floor Expansion Joint Caulking Sidewalk/Saddle (Gray)
- Interior Door Frame Caulking (Gray)
- Interior Door Frame Caulking (White)
- Exterior Door Frame Caulking (Gray)
- Exterior Door Frame Caulking (Red)
- Exterior Door Silicone (White/Clear)

4.0 INSPECTION RESULTS

A. ASBESTOS-CONTAINING MATERIAL

The asbestos inspection involved a thorough visual examination of all areas that may be impacted by the proposed SED Survey project at the Fox Lane High School. The following suspect materials were sampled and analyzed for asbestos content by WSP:

4.1 Table 4.1 – Suspect Materials Inspected

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
WSP Sampled on 08/24/22			
A	Interior	12”x12” Floor Tile (White w/Brown Specs)	NAD
B	Interior	Mastic to 12”x12” Floor Tile White w/Brown Specs	NAD
C	Exterior	Exterior Stucco (Gray)	NAD
D	Interior	Wall Plaster (Brown)	NAD
E	Interior	Wall Plaster (White)	NAD
F	Interior	6” Cove Base (Gray)	NAD
G	Interior	Glue to 6” Cove Base (Yellow)	NAD
H	Interior	Glazed Block Mortar (Tan)	NAD
I	Exterior	Exterior Brick Mortar (Gray)	NAD
J	Interior	Interior Brick Mortar (Gray)	NAD
K	Interior	Carpet Glue (Yellow/Gray)	NAD

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
L	Interior	Mortar under Door Saddle (Gray)	NAD
M	Interior	Ceramic Baseboard Backing/Glue (Gray)	NAD
N	Interior	Ceramic Floor Tile Mortar	NAD
O	Interior	12”x12” Floor Tile (Pink)	NAD
P	Interior	Mastic to 12”x12” Floor Pink Tile (Black)	NAD
Q	Exterior	Exterior Brick Mortar (Red)	NAD
R	Interior	2’x2’ Pinhole Ceiling Tile (Gray)	NAD
S	Interior	2’x4’ Ceiling Tile (Gray)	NAD
T	Interior	Glazed Block Mortar (Gray)	NAD
U	Interior	Gypsum Board (Gray)	NAD
V	Interior	Joint Compound (White)	NAD
W	Interior	Leveling/Mastic at Door (Black/Gray)	NAD
X	Interior	24”x24” Floor Tile (Gray)	NAD
Y	Interior	Mastic to 24”x24” Floor Tile (Black)	NAD
Z	Interior	12”x12” Floor Tile (Gray, Green Specs)	NAD
A1	Interior	Mastic 12”x12” Floor Tile (Black)	NAD
B1	Interior	Cinderblock Mortar (Gray)	NAD
C1	Interior	Baseboard (Light Brown)	NAD
D1	Interior	Glue to Baseboard (Yellow)	NAD
E1	Tennis Court	Asphalt (Black)	NAD
F1	Tennis Court	Green Coating	NAD
G1	Tennis Court	White Coating	NAD
H1	Tennis Court	Red Coating	NAD
I1	Exterior	Exterior Expansion Joint Caulking Sidewalk/Saddle (Gray)	NAD
J1	Interior	Interior Door Frame Caulking (Gray)	NAD
K1	Interior	Interior Door Frame Caulking (White)	NAD
L1	Exterior	Exterior Door Frame Caulking (Gray)	NAD
M1	Exterior	Exterior Door Frame Caulking (Red)	NAD
AHERA Report			
-	**Throughout**	**Floor Tiles & Mastic - Not Affected by Current SOW**	**ACM**

Bold = Positive for ACM NAD = No Asbestos Detected NA/PS = Not analyzed/ positive sample

4.2 CONDITION AND FRIABLITY ASSESSMENT TABLE

For each inspection conducted, the inspector classifies ACM or Assumed ACM materials by friability and condition. This helps to determine the extent of damage in certain areas as well as the potential for further damage and Asbestos release due to disturbance of the material.

Table 4.2 – Condition and Friability Assessment

Location	Material	Quantity	Friability	Condition
None				

Condition Definitions:
Good: None/Minimal apparent damage to ACM
Fair: Up to 10% localized damage or up to 25% of the entire ACM is damaged
Poor: Over 10% localized damage or over 25% of the entire ACM is damaged

4.3 SAMPLE ANALYSIS TABLE

Laboratory analysis results, in tabular form, are included in Appendix A.

B. LEAD-BASED PAINT

The lead Inspection involved a thorough visual examination of all accessible areas impacted by the proposed SED Survey project at the Fox Lane High School. The following suspect surfaces were tested for lead content:

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
Previous WSP Report dated 08/24/22						
1	Calibration Check @ 1.0	---	---	---	---	1.1
2	Calibration Check @ 1.0	---	---	---	---	0.7
3	Calibration Check @ 1.0	---	---	---	---	0.6
4	Calibration Check @ 0.0	---	---	---	---	0.0
5	Calibration Check @ 0.0	---	---	---	---	0.0
6	Calibration Check @ 0.0	---	---	---	---	0.1
7	Corridor 1DA	Wall	Beige	Gypsum	Intact	0.3
8	Corridor 1DA	Door Frame	Gray	Metal	Intact	0.4
9	Corridor 1DA	Wall	Gray/Beige	Cinderblock	Intact	0.0

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
10	Corridor 1DA	Exterior Door Frame	Beige	Metal	Intact	0.1
11	Corridor 1DA	Exterior Door	Beige	Metal	Intact	0.1
12	Room A101	Wall	Beige	Gypsum	Intact	0.2
13	Room A101	Baseboard	Beige	Vinyl	Intact	0.1
14	Corridor 1F	Door	Beige	Metal	Intact	0.0
15	Corridor 1F	Door Frame	Purple	Metal	Intact	0.3
16	Band 85	Exterior Lintel	Beige	Metal	Intact	0.0
17	Band 85	Door	Purple	Metal	Intact	0.0
18	Corridor 1E	Wall	Beige	Plaster	Intact	0.3
19	Cold Storage 21E	Door	Green	Metal	Intact	0.2
20	Cold Storage 21E	Wall	Green	Cinderblock	Intact	0.3
21	**Cold Storage 21E**	**Door Lintel**	**Green**	**Metal**	**Intact**	**3.2**
22	Corridor X1B	Wall	Brown/ Beige	Gypsum	Intact	0.3
23	Corridor 1K	Door	Gray	Metal	Intact	-0.1
24	Corridor 1K	Door Frame	Gray	Metal	Intact	0.0
25	Corridor 1K	Door Lintel	Gray	Metal	Intact	0.3
26	Library	Door	Red	Metal	Intact	0.2
27	Fitness Room	Wall	Red	Cinderblock	Intact	0.2
28	Room 202	Wall	White	Cinderblock	Intact	0.1
29	Room 202	Door	Red	Metal	Intact	-0.1
30	Room 202	Door Frame	Red	Metal	Intact	0.0
31	Room 202	Wall	Brown	Ceramic Tile	Intact	0.4
32	Room 202	Door Frame	Gray	Metal	Intact	0.0
33	Room 202	Door	Varnish	Wood	Intact	0.1
34	Hallway 2A	Wall	Green	Gypsum	Intact	0.2
35	Hallway 2A	Wall	Beige/ Brown	Gypsum	Intact	0.1
36	Girls Bath	Wall	Tan	Cinderblock	Intact	0.1
37	Calibration Check @ 1.0	---	---	---	---	1.1
38	Calibration Check @ 1.0	---	---	---	---	1.0
39	Calibration Check @ 1.0	---	---	---	---	1.0
40	Calibration Check @ 0.0	---	---	---	---	0.0
41	Calibration Check @ 0.0	---	---	---	---	0.0
42	Calibration Check @ 0.0	---	---	---	---	0.1

C. PCB-CONTAINING MATERIAL

The PCB Inspection involved a thorough visual examination of all areas that may be impacted by the proposed SED Survey project at the Fox Lane High School. The following suspect materials were tested for PCB content:

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	PCB CONTENT (PPM)
A	Corridor 1F	Exterior Floor Expansion Joint Caulking Sidewalk/Saddle (Gray)	ND
B	Room 21E	Interior Door Frame Caulking (Gray)	0.495
C	Fitness Room	Interior Door Frame Caulking (White)	0.490
D	Room 21E	Exterior Door Frame Caulking (Gray)	ND
E	Room A101 Corridor 1D Exit A	Exterior Door Frame Caulking (Red)	ND
F	Corridor 1J	Exterior Door Silicone (White/Clear)	ND

5.0 AREAS NOT ACCESSIBLE

During the inspection the following areas were not accessible:

Spaces within Walls/Floors/Ceilings: No destructive sampling was performed on concealed spaces in walls to access plenum, chases etc. It should be assumed that asbestos containing materials may exist in these spaces. Any suspect materials encountered during work should be sampled for analysis before work continues.

Building Envelope: No destructive sampling was performed on the building envelope. It should be assumed that asbestos, lead and PCB containing materials may exist in these spaces. Any suspect materials encountered during work should be sampled for analysis before work continues.

6.0 CONCLUSIONS AND RECOMMENDATIONS

LBP was identified in this inspection that may be impacted as part of the proposed SED Survey project at the Fox Lane High School.

No ACM or PCB have been identified in this inspection that may be impacted as part of the proposed SED Survey project at the Fox Lane High School.

The ACM, LBP & PCB inspection was conducted at the request of Bedford Centra School District for the proposed SED Survey project at the Fox Lane High School. Any change in the scope of work will require further investigation to accurately classify any additional ACM, LBP or PCBs resulting from the modified or updated scope of work.

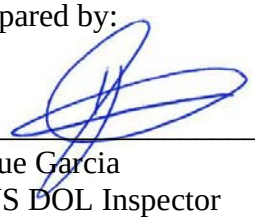
7.0 REPORT CERTIFICATIONS

This report, and the supporting data, findings, conclusions, opinions, and recommendations it contains represent the result of WSP's efforts for the environmental inspection work for the Fox Lane High School, SED Survey project.

Opinions and recommendations presented in this report apply to site conditions and features as they existed at the time of WSP's site visits, and those reasonably foreseeable. They cannot necessarily apply to conditions and features of which WSP is unaware and has not had the opportunity to evaluate.

The conclusions presented in this report are professional opinions solely upon WSP's visual observations of accessible areas, laboratory test data, and current regulatory requirements. These conclusions are intended exclusively for the purpose stated herein and the site indicated for the project indicated.

Prepared by:



Josue Garcia
NYS DOL Inspector

Reviewed by:

Steven Eget, PE
Vice President

APPENDIX A:
ASBESTOS SAMPLE ANALYSIS RESULTS IN TABULAR FORM

APPENDIX A
SAMPLE ANALYSIS RESULTS IN TABULAR FORM
FOX LANE HIGH SCHOOL
SED SURVEY PROJECT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
WSP Sampled on 08/24/2022					
A	01	Band Room 85	12”x12” Floor Tile (White w/Brown Specs)	NAD	NAD
	02	Band Room 85		NAD	NAD
B	03	Band Room 85	Mastic to 12”x12” Floor Tile White w/Brown Specs	NAD	NAD
	04	Band Room 85		NAD	NAD
C	05	Exterior by Corridor X1B	Exterior Stucco (Gray)	NAD	N/A
	06	Exterior by Corridor X1B		NAD	N/A
	07	Exterior by Corridor 1B		NAD	N/A
D	08	Corridor X1B	Wall Plaster (Brown)	NAD	N/A
	09	Corridor 1B		NAD	N/A
	10	Corridor 1E		NAD	N/A
E	11	Corridor X1B	Wall Plaster (White)	NAD	N/A
	12	Corridor 1B		NAD	N/A
	13	Corridor 1E		NAD	N/A
F	14	Band Room 85	6” Cove Base (Gray)	NAD	NAD
	15	Band Room 85		NAD	NAD
G	16	Band Room 85	Glue to 6” Cove Base (Yellow)	NAD	NAD
	17	Band Room 85		NAD	NAD
H	18	Corridor 1D	Glazed Block Mortar (Tan)	NAD	N/A
	19	Corridor X1B		NAD	N/A
I	20	Exterior	Exterior Brick Mortar (Gray)	NAD	N/A
	21	Exterior		NAD	N/A

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
J	22	Library	Interior Brick Mortar (Gray)	NAD	N/A
	23	Library		NAD	N/A
K	24	Library	Carpet Glue (Yellow/Gray)	NAD	NAD
	25	Library		NAD	NAD
L	26	Corridor F1	Mortar under Door Saddle (Gray)	NAD	N/A
	27	Room A101		NAD	N/A
M	28	Room 21E	Ceramic Baseboard Backing/Glue (Gray)	NAD	NAD
	29	Room 21E		NAD	NAD
N	30	Room 21E	Ceramic Floor Tile Mortar	NAD	N/A
	31	Room 21E		NAD	N/A
O	32	Lower-Level Stair A	12”x12” Floor Tile (Pink)	NAD	NAD
	33	Lower-Level Stair A		NAD	NAD
P	34	Lower-Level Stair A	Mastic to 12”x12” Floor Pink Tile (Black)	NAD	NAD
	35	Lower-Level Stair A		NAD	NAD
Q	36	Corridor 1D east A	Exterior Brick Mortar (Red)	NAD	N/A
	37	Lower-Level Stair A		NAD	N/A
R	38	Corridor 3A	2’x2’ Pinhole Ceiling Tile (Gray)	NAD	NAD
	39	Corridor 1F		NAD	NAD
S	40	Library	2’x4’ Ceiling Tile (Gray)	NAD	NAD
	41	Library		NAD	NAD
T	42	Corridor 3A	Glazed Block Mortar (Gray)	NAD	N/A
	43	Corridor 2A		NAD	N/A
U	44	Corridor 1D	Gypsum Board (Gray)	NAD	N/A
	45	Corridor 2A by Stair S		NAD	N/A
V	46	Corridor 1D	Joint Compound (White)	NAD	N/A
	47	Corridor 2A by Stair S		NAD	N/A
W	48	Fitness Center	Leveling/Mastic at Door (Black/Gray)	NAD	N/A
	49	Fitness Center		NAD	N/A
X	50	Room 201	24”x24” Floor Tile (Gray)	NAD	NAD
	51	Room A101		NAD	NAD
Y	52	Room 201	Mastic to 24”x24” Floor Tile (Black)	NAD	NAD
	53	Room A101		NAD	NAD

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Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
Z	54	Corridor 1D	12”x12” Floor Tile (Gray, Green Specs)	NAD	NAD
	55	2nd Floor Corridor 2A		NAD	NAD
A1	56	Corridor 1D	Mastic 12”x12” Floor Tile (Black)	NAD	NAD
	57	2nd Floor Corridor 2A		NAD	NAD
B1	58	Room 21E	Cinderblock Mortar (Gray)	NAD	N/A
	59	Room 301		NAD	N/A
C1	60	Room A101	Baseboard (Light Brown)	NAD	NAD
	61	Room 201		NAD	NAD
D1	62	Room A101	Glue to Baseboard (Yellow)	NAD	NAD
	63	Room 201		NAD	NAD
E1	64	Tennis Court	Asphalt (Black)	NAD	NAD
	65	Tennis Court		NAD	NAD
F1	66	Tennis Court	Green Coating	NAD	NAD
	67	Tennis Court		NAD	NAD
G1	68	Tennis Court	White Coating	NAD	NAD
	69	Tennis Court		NAD	NAD
H1	70	Tennis Court	Red Coating	NAD	NAD
	71	Tennis Court		NAD	NAD
I1	72	Corridor 1F	Exterior Expansion Joint Caulking Sidewalk/Saddle (Gray)	NAD	NAD
	73	Corridor 1F		NAD	NAD
J1	74	Room 21E	Interior Door Frame Caulking (Gray)	NAD	NAD
	75	Room 21E		NAD	NAD
K1	76	Fitness Room	Interior Door Frame Caulking (White)	NAD	NAD
	77	Fitness Room		NAD	NAD
L1	78	Room 21E	Exterior Door Frame Caulking (Gray)	NAD	NAD
	79	Room 21E		NAD	NAD
M1	80	Outside Room A101	Exterior Door Frame Caulking (Red)	NAD	NAD
	81	Corridor 1D Exit A		NAD	NAD

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APPENDIX B:
ASBESTOS BULK SAMPLE FIELD DATA SHEETS WITH CHAIN OF CUSODY & LABORATORY RESULTS

Atlas Environmental Lab, Corp.
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Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford School District / 31405320.012
Project Address: Fox Lane HS
Collected By: Client
Work Area: Throughout Interior / Exterior

AEL ID# BK0822417
Date Received: 8/26/2022
PLM Date Analyzed: 8/27/2022
TEM Date Analyzed: 8/29/2022
Report Date: 8/29/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
A-1	BK0822417-1	Band Rm 85 - 12x12 Floor Tile (White w/ Brown Specs)	Grey, Homogeneous, Non-Fibrous	14.5	19.1	66.4	0%	100%	**NAD** Inconclusive	**NAD**		X	X
A-2	BK0822417-2	Band Rm 85 - 12x12 Floor Tile (White w/ Brown Specs)	Grey, Homogeneous, Non-Fibrous	15.1	48.6	36.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X
B-3	BK0822417-3	Band Rm 85 - Mastic to 12x12 Floor Tile (White w/ Brown Specs)	Black, Homogeneous, Non-Fibrous	24.2	11.4	64.4	0%	100%	**NAD** Inconclusive	**NAD**		X	X
B-4	BK0822417-4	Band Rm 85 - Mastic to 12x12 Floor Tile (White w/ Brown Specs)	Black, Homogeneous, Non-Fibrous	30.6	31.2	38.2	0%	100%	**NAD** Inconclusive	**NAD**		X	X
C-5	BK0822417-5	Exit by Corr X1B - Ext Stucco (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
C-6	BK0822417-6	Exit by Corr X1B - Ext Stucco (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
C-7	BK0822417-7	Exit by Corr 1B - Ext Stucco (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
D-8	BK0822417-8	Corr X1B - Wall Plaster (Brown)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
D-9	BK0822417-9	Corr 1B - Wall Plaster (Brown)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
D-10	BK0822417-10	Corr 1E - Wall Plaster (Brown)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		

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							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
E-11	BK0822417-11	Corr X1B - Wall Plaster (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
E-12	BK0822417-12	Corr 1B - Wall Plaster (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
E-13	BK0822417-13	Corr 1E - Wall Plaster (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
F-14	BK0822417-14	Band Room 85 - 6" Cove Base (Grey)	Green, Homogeneous, Non-Fibrous	79.1	1.8	19.1	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
F-15	BK0822417-15	Band Room 85 - 6" Cove Base (Grey)	Green, Homogeneous, Non-Fibrous	55.0	3.8	41.1	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
G-16	BK0822417-16	Band Room 85 - Glue to 6" Cove Base (Yellow)	Yellow, Homogeneous, Non-Fibrous	60.6	30.3	9.1	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
G-17	BK0822417-17	Band Room 85 - Glue to 6" Cove Base (Yellow)	Yellow, Homogeneous, Non-Fibrous	57.2	29.7	13.1	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
H-18	BK0822417-18	Coord 1D - Glazed Block Mortar (Tan)	Yellow, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
H-19	BK0822417-19	Coord X1B - Glazed Block Mortar (Tan)	Yellow, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
I-20	BK0822417-20	Exterior - Exterior Brick Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		

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							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
I-21	BK0822417-21	Exterior - Exterior Brick Mortar (Grey)	Brown, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
J-22	BK0822417-22	Library - Int Brick Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
J-23	BK0822417-23	Library - Int Brick Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
K-24	BK0822417-24	Library - Carpet Glue (Yellow/Grey)	Grey, Homogeneous, Non-Fibrous	27.2	33.6	39.2	0%	100%	NAD Inconclusive	NAD		X	X
K-25	BK0822417-25	Library - Carpet Glue (Yellow/Grey)	Grey, Homogeneous, Non-Fibrous	23.4	13.5	63.0	0%	100%	NAD Inconclusive	NAD		X	X
L-26	BK0822417-26	Corr FL - Mortar Under Door Saddle (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
L-27	BK0822417-27	Rm A101 - Mortar Under Door Saddle (Grey)	Brown, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
M-28	BK0822417-28	Rm 21E - Ceramic Baseboard Backing / Glue (Grey)	White/Grey, Homogeneous, Non-Fibrous	30.7	4.7	64.6	0%	100%	NAD Inconclusive	NAD		X	X
M-29	BK0822417-29	Rm 21E - Ceramic Baseboard Backing / Glue (Grey)	White/Grey, Homogeneous, Non-Fibrous	32.2	9.3	58.4	0%	100%	NAD Inconclusive	NAD		X	X
N-30	BK0822417-30	Rm 21E - Ceramic FT (Mortar)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		

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							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
N-31	BK0822417-31	Rm 21E - Ceramic FT (Mortar)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
O-32	BK0822417-32	Stair A LL - 12x12 Floor Tile (Pink)	Red/Black, Homogeneous, Non-Fibrous	17.9	25.3	56.8	0%	100%	NAD Inconclusive	NAD		X	X
O-33	BK0822417-33	Stair A LL - 12x12 Floor Tile (Pink)	Red/Black, Homogeneous, Non-Fibrous	18.8	42.4	38.8	0%	100%	NAD Inconclusive	NAD		X	X
P-34	BK0822417-34	Stair A LL - Mastic to 12x12 Floor Pink Tile (Black)	Black, Homogeneous, Non-Fibrous	29.3	32.7	38.0	0%	100%	NAD Inconclusive	NAD		X	X
P-35	BK0822417-35	Stair A LL - Mastic to 12x12 Floor Pink Tile (Black)	Black, Homogeneous, Non-Fibrous	30.6	19.7	49.7	0%	100%	NAD Inconclusive	NAD		X	X
Q-36	BK0822417-36	Coor 1D East A - Ext Brick Mortar (Red)	Brown, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
Q-37	BK0822417-37	Lower Level Stair A - Ext Brick Mortar (Red)	Brown, Homogeneous, Friable	Not Applicable			5%Synthetic	95%	NAD		X		
R-38	BK0822417-38	Coor 3A - 2'x2' Pinhole CT (Grey)	White/Grey, Homogeneous, Non-Fibrous	15.6	83.5	0.9	0%	100%	NAD Inconclusive	NAD		X	X
R-39	BK0822417-39	Coor 1F - 2'x2' Pinhole CT (Grey)	White/Grey, Homogeneous, Non-Fibrous	16.0	48.5	35.5	0%	100%	NAD Inconclusive	NAD		X	X
S-40	BK0822417-40	Library - 2'x4' Ceiling Tile (Grey)	White/Grey, Homogeneous, Non-Fibrous	31.8	46.0	22.2	0%	100%	NAD Inconclusive	NAD		X	X

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							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
S-31	BK0822417-41	Library - 2'x4' Ceiling Tile (Grey)	White/Grey, Homogeneous, Non-Fibrous	31.1	42.5	26.4	0%	100%	**NAD** Inconclusive	**NAD**		X	X
T-42	BK0822417-42	Coor 3A - Glazed Block Mortar (Grey)	Yellow, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
T-43	BK0822417-43	Coor 2A - Glazed Block Mortar (Grey)	Yellow, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
U-44	BK0822417-44	Coor 1D - Gypsum Board (Grey)	Grey, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	**NAD**		X		
U-45	BK0822417-45	Coor 2A by Stair S - Gypsum Board (Grey)	Grey, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	**NAD**		X		
V-46	BK0822417-46	Coor 1D - Joint Compound (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
V-47	BK0822417-47	Coor 2A by Stair S - Joint Compound (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
W-48	BK0822417-48	Fitness Center - Leveling / Mastic at Door (Black / Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
W-49	BK0822417-49	Fitness Center - Leveling / Mastic at Door (Black / Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
X-50	BK0822417-50	Room 201 - 24"x24" Floor Tile (Grey)	Black/Yellow, Homogeneous, Non-Fibrous	57.8	4.8	37.5	0%	100%	**NAD** Inconclusive	**NAD**		X	X

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							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
X-51	BK0822417-51	Room A101 - 24"x24" Floor Tile (Grey)	Black/Beige, Homogeneous, Non-Fibrous	57.2	3.8	39.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
Y-52	BK0822417-52	Room 201 - Mastic to 24"x24" FT (Black)	Yellow, Homogeneous, Non-Fibrous	57.0	5.0	38.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
Y-53	BK0822417-53	Room A101 - Mastic to 24"x24" FT (Black)	Grey, Homogeneous, Non-Fibrous	57.4	14.2	28.4	0%	100%	**NAD** Inconclusive	**NAD**		X	X
Z-54	BK0822417-54	Coor 1D - 12x12 Floor Tile (Grey/Green Specs)	Multicolor, Homogeneous, Non-Fibrous	14.9	54.5	30.6	0%	100%	**NAD** Inconclusive	**NAD**		X	X
Z-55	BK0822417-55	2nd FL Coor 2A - 12x12 Floor Tile (Grey/Green Specs)	Multicolor, Homogeneous, Non-Fibrous	15.1	43.1	41.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X
A1-56	BK0822417-56	Coor 1D - Mastic to 12x12 Floor Tile (Black)	Black, Homogeneous, Non-Fibrous	45.4	23.0	31.6	0%	100%	**NAD** Inconclusive	**NAD**		X	X
A1-57	BK0822417-57	2nd FL Coor 2A - Mastic to 12x12 Floor Tile (Black)	Black, Homogeneous, Non-Fibrous	62.2	24.2	13.6	0%	100%	**NAD** Inconclusive	**NAD**		X	X
B1-58	BK0822417-58	Rm 21E - Cinder Block Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
B1-59	BK0822417-59	Rm 301 - Cinder Block Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
C1-60	BK0822417-60	Rm A101 - Baseboard (Light Brown)	Beige, Homogeneous, Non-Fibrous	50.0	9.8	40.2	0%	100%	**NAD** Inconclusive	**NAD**		X	X

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							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
C1-61	BK0822417-61	Rm 201 - Baseboard (Light Brown)	Beige, Homogeneous, Non-Fibrous	53.7	20.4	25.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X
D1-62	BK0822417-62	Rm A101 - Glue to Baseboard (Yellow)	Yellow, Homogeneous, Non-Fibrous	44.4	25.0	30.6	0%	100%	**NAD** Inconclusive	**NAD**		X	X
D2-63	BK0822417-63	Rm 201 - Glue to Baseboard (Yellow)	Yellow, Homogeneous, Non-Fibrous	52.4	29.7	18.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
E1-64	BK0822417-64	Tennis Court - Asphalt (Black)	Black, Homogeneous, Non-Fibrous	6.9	68.4	24.7	0%	100%	**NAD** Inconclusive	**NAD**		X	X
E1-65	BK0822417-65	Tennis Court - Asphalt (Black)	Black, Homogeneous, Non-Fibrous	6.7	70.2	23.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
F1-66	BK0822417-66	Tennis Court - Green Coating	Green/Black, Homogeneous, Non-Fibrous	18.8	18.3	62.9	0%	100%	**NAD** Inconclusive	**NAD**		X	X
F1-67	BK0822417-67	Tennis Court - Green Coating	Green/Black, Homogeneous, Non-Fibrous	10.3	72.6	17.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
G1-68	BK0822417-68	Tennis Court - White Coating	White/Black, Homogeneous, Non-Fibrous	22.9	70.3	6.9	0%	100%	**NAD** Inconclusive	**NAD**		X	X
G1-69	BK0822417-69	Tennis Court - White Coating	White/Black, Homogeneous, Non-Fibrous	25.2	60.9	13.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X
H1-70	BK0822417-70	Tennis Court - Red Coating	Red/Black, Homogeneous, Non-Fibrous	22.3	71.3	6.5	0%	100%	**NAD** Inconclusive	**NAD**		X	X

Atlas Environmental Lab, Corp.
255 West 36th Street, Suite# 1503
New York, NY 10018
Phone:(212) 563-0400 Fax:(212) 563-0401
www.atlasenvironmentallab.com

Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford School District / 31405320.012
Project Address: Fox Lane HS
Collected By: Client
Work Area: Throughout Interior / Exterior

AEL ID# BK0822417
Date Received: 8/26/2022
PLM Date Analyzed: 8/27/2022
TEM Date Analyzed: 8/29/2022
Report Date: 8/29/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
H1-71	BK0822417-71	Tennis Court - Red Coating	Red/Black, Homogeneous, Non-Fibrous	18.3	66.7	15.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
I1-72	BK0822417-72	Corr 1F - Ext Floor Expansion Joint CaulkingSidewalk / Saddle (Grey)	Grey, Homogeneous, Non-Fibrous	77.4	12.4	10.2	0%	100%	**NAD** Inconclusive	**NAD**		X	X
I1-73	BK0822417-73	Corr 1F - Ext Floor Expansion Joint CaulkingSidewalk / Saddle (Grey)	Grey, Homogeneous, Non-Fibrous	78.3	11.4	10.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X
J1-74	BK0822417-74	Rm 21E - Interior Door Frame Caulking (Grey)	Grey, Homogeneous, Non-Fibrous	47.2	4.8	48.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
J1-75	BK0822417-75	Rm 21E - Interior Door Frame Caulking (Grey)	Grey, Homogeneous, Non-Fibrous	45.6	7.0	47.4	0%	100%	**NAD** Inconclusive	**NAD**		X	X
K1-76	BK0822417-76	Fitness Room - Interior door Frame Caulking (White)	White/Beige, Homogeneous, Non-Fibrous	51.4	20.7	27.9	0%	100%	**NAD** Inconclusive	**NAD**		X	X
K1-77	BK0822417-77	Fitness Room - Interior door Frame Caulking (White)	White/Beige, Homogeneous, Non-Fibrous	51.2	24.7	24.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
L1-78	BK0822417-78	Rm 21E - Exterior Door frame Caulking Frame (Grey)	Black/Grey, Homogeneous, Non-Fibrous	38.1	5.8	56.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
L1-79	BK0822417-79	Rm 21E - Exterior Door frame Caulking Frame (Grey)	Black/Grey, Homogeneous, Non-Fibrous	37.1	7.6	55.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X
M1-80	BK0822417-80	Outside room A101 Coord. 1D Exit A - Exterior Door Frame Caulking (Red)	Red, Homogeneous, Non-Fibrous	75.9	6.0	18.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X

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Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford School District / 31405320.012
Project Address: Fox Lane HS
Collected By: Client
Work Area: Throughout Interior / Exterior

AEL ID# BK0822417
Date Received: 8/26/2022
PLM Date Analyzed: 8/27/2022
TEM Date Analyzed: 8/29/2022
Report Date: 8/29/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	AII %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
M1-81	BK0822417-81	Outside room A101 Coord. 1D Exit A - Exterior Door Frame Caulking (Red)	Red, Homogeneous, Non-Fibrous	82.0	5.0	13.1	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**

AL

Quantitative Analysis (Semi/Full):Bulk Asbestos Analysis-PLM by EPA 600/M4-82-020 per 40 CFR or ELAP198.1 (friable) and 198.6 (NOB) samples for New York.

NAD=no asbestos detected, NA/PS=Not Analyzed/Positive Stop, Trace=<1%,FBGL=Fiberglass, CELL=Cellulose,CHRY=Chrysotile,Amo=Amosite,CRO=Crocidolite,ANTH=Anthophylite, TRE=Tremolite, ACT=Actinolite, NA=not applicable.

PLM is not consistently reliable in detecting Asbestos in floor coverings and similar non friable organically bound materials. NAD or Trace results by PLM are inconclusive.

TEM is currently the only method that can be used to determine if this material can be considered or treated as non asbestos containing in NY State.

All samples were prepared and analyzed in accordance with the EPA "TEM Method for Identifying and Quantifying Asbestos in Non-Fibrous Organically Bound Bulk Samples" ELAP 198.4".

ORG%=Ashed Organic%, AII= Acid Insoluble Inorganic%, ASI= Acid Soluble Inorganic%

This "Summary of Analytical Results "shall not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, ELAP or any agency of the U.S Government. The results relate only to the items tested. This report may not be reproduced, except in full, without the written approval of AEL .Atlas Environmental lab did not collect the analyzed samples and thus accepts no liability with regard to their collection and/or maintenance . AEL relies on client's data. The liability of Atlas Environmental Lab corp with respect to the services charged, shall in no event exceed the amount of the invoice.

NYS-ELAP#11999, NVLAP Lab Code: 500092-0, NJ ID: NY034 "ELCP on NJ won't apply to TEM", CT ID:PH-0154

PLM Analyst: DK TEM Analyst: VR Approved by:

BLC0822417

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.012
CLIENT: Bedford School District
PROJECT SITE: Fox Lane HS
Project Manager: A.Smolyar

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/24/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

WSP
TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: Penn One, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. ☑ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
A	1	Band Rm 85	12x12 Floor tile (white w/		
↓	2	↓	Brown specs)		
B	3		Mastic to 12x12 floor		
↓	4	↓	tile Brown/white specs		
C	5	Ext by Corr. X1B	Ext. Stucco (gray)		
↓	6	↓ X1B	↓		
↓	7	↓ 1B	↓		
d	8	Coor. X1B	Wall Plaster (Brown)		
↓	9	1B	↓		
↓	10	1E	↓		
E	11	X1B	(white)		
↓	12	1B	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
A. Smolyar		8/26/22									
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
						8/26/22	17:10				

Relinquished by 8/29/22

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

PLM Analyst D. Kirnossenko 08/27/22 17:00

BLC0822417

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.012
CLIENT: Bedford School District
PROJECT SITE: Fox Lane HS
Project Manager: A.Smolyar

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/24/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

WSP
TELEPHONE NO. : (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: Penn One, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. ☑ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
E	13	Corr 1B	Wall Plaster (white)		
F	14	Band Room 85	6" Cove base (gray)		
↓	15	↓	↓		
G	16		glue to 6" Cove base		
↓	17	↓	(yellow)		
H	18	Coord. ID	Glazed block mortar		
↓	19	X1B	(tan)		
I	20	Exterior	Exterior Brick Mortar		
↓	21	↓	(gray)		
J	22	Library	Int. Brick Mortar		
↓	23	↓	(gray)		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
D. Smolyar		8/26/22									
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
						8/26/22	17:45				

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

PLM Analyst [illegible] 08/27/22 17:50

BLC0822417

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.012
CLIENT: Bedford School District
PROJECT SITE: Fox Lane HS
Project Manager: A.Smolyar

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/24/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

WSP
TELEPHONE NO. : (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: Penn One, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐12 HR. ☐24 HR. ☐ 48 HR. ☑ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
K	24	Library	Carpet glue (yellow/gray)		
↓	25	↓	↓		
L	26	Corr. F1	Mortar under door		
↓	27	Rm A101	Saddle (gray)		
M	28	Rm 21E	Ceramic baseboard		
↓	29	↓	backing/glue (gray)		
N	30	Rm 21E	Ceramic F.T. (mortar)		
↓	31	↓	↓		
O	32	Stair A LL	12 x 12 Floor tile		
↓	33		(Pink)		
P	34		Mastic to 12 x 12 Floor Pink		
↓	35	↓	tile (black)		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
D Smolyar		8.26.22				/ /				/ /	
Received by: (print)	(Sign)	/ /	AM/PM	Received by: (print) Jordan Parker	(Sign)	8/26/22 12:15	AM/PM	Received by: (print)	(Sign)	/ /	AM/PM

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

DLM Analyst JParker D.Kirnossenko 08/27/22 17:52

BK0822417

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.012
CLIENT: Bedford School District
PROJECT SITE: Fox Lane HS
Project Manager: A.Smolyar

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/24/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

WSP
TELEPHONE NO. : (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: Penn One, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐12 HR. ☐24 HR. ☐48 HR. ☑72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
Q	36	Corr. ID East A	Ext Brick Mortar		
↓	37	Lower Level Stair A	(red)		
R	38	Corr 3A	2'x2' Pinhole CT		
↓	39	↓ 1F	(gray)		
S	40	Library	2'x4' Ceiling Tile		
↓	41	↓	(gray)		
T	42	Corr 3A	Glued Block Mortar		
↓	43	↓ 2A	(gray)		
U	44	Corr 1D	Gypsum board (gray)		
↓	45	2A by Stair S	↓		
V	46	1D	Joint Compound (wht)		
↓	47	2A by Stair S	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
A. Smolyar		8/26/22				/ /				/ /	
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)	8/26/22	AM/PM	Received by: (print)	(Sign)		AM/PM
		/ /								/ /	

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

DLM Analyst /D. Kirnossenko/ 08/27/22 XS 17:50

BK08 22417

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.012
CLIENT: Bedford School District
PROJECT SITE: Fox Lane HS
Project Manager: A.Smolyar

WSP
TELEPHONE NO. : (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: Penn One, 4th Floor, New York, NY 10119

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/24/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐12 HR. ☐24 HR. ☐48 HR. ☑72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
W	48	Fitness Center	leveling / mastic at		
b	49	"	door (black/grey)		
X	50	Room 201	24"x24" Floor tile (grey)		
b	51	A101	↓		
Y	52	201	Mastic to 24"x24" FT		
b	53	A101	(black)		
Z	54	Coor. 1D	12x12 Floor tile		
b	~~55~~	2nd Fl Corr. 2A	(grey/green specs)		
A1	~~56~~	Coor. 1D	Mastic to 12x12 Floor tile		
b	~~57~~	2nd Fl Corr. 2A	(black)		
B1	58	Rm 21E	Cinder Block Mortar		
b	59	Rm 301	(grey)		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
D. Smolyar		8/26/22									
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
						8/26/22 1740					

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

PLM Analyst RShop D.Kogan 08/27/22 1752

B1C022417

WSP ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.012
CLIENT: Bedford School District
PROJECT SITE: Fox Lane HS
Project Manager: A.Smolyar

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/24/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

WSP
TELEPHONE NO. : (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: Penn One, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. ☑ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
C1	60	Rm A101	Baseboard (Light Brown)		
↓	61	201	↓		
D1	62	A101	glue to baseboard (yellow)		
↓	63	201	↓		
E1	64	Tennis Court	Asphalt (black)		
↓	65	↓	↓		
F1	66		green coating		
↓	67		↓		
G1	68		white coating		
↓	69		↓		
H1	70		red coating		
↓	71	↓	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
D. Smolyar		8/26/22									
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)	8/26/22	17:15 AM/PM	Received by: (print)	(Sign)		AM/PM

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

PLM Analyst - Perkins / D Kirnossenko 08/27/22 17:15

BLC0822417

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.012
CLIENT: Bedford School District
PROJECT SITE: Fox Lane HS
Project Manager: A.Smolyar

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/24/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

WSP
TELEPHONE NO. : (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: Penn One, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. ☑ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
I1	72	Corr. 1F	Ext. floor expansion joint		
↓	73	↓	caulking sidewalk/saddle (gray)		
T1	74	Rm 21E	Interior Door Frame		
↓	75	↓	Caulking (gray)		
K1	76	Fitness Room	Interior Door frame caulking		
↓	77	↓	(white)		
L1	78	Rm 21E	Exterior Door Frame		
↓	79	↓	caulking (gray)		
M1	80	Outside Room A101	Exterior Door Frame		
↓	81	Coord. ID EXT-A	Caulking (red)		

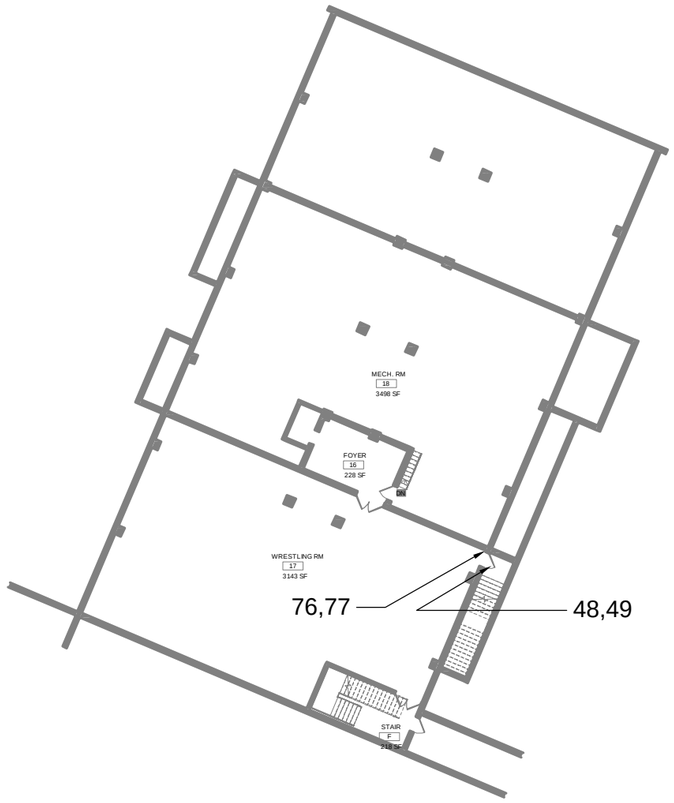
CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
A. Smolyar		8/26/22									
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
						8/26/22 17:45					

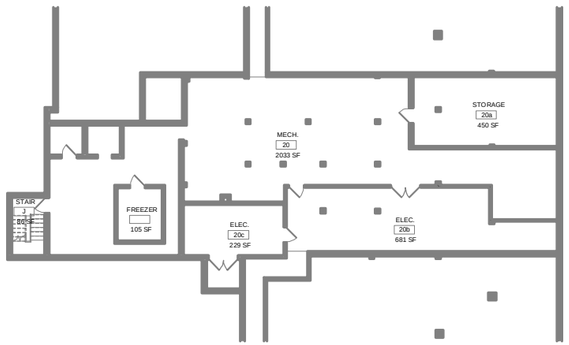
NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

PLM Analyst [signature] 08/27/22 17:50

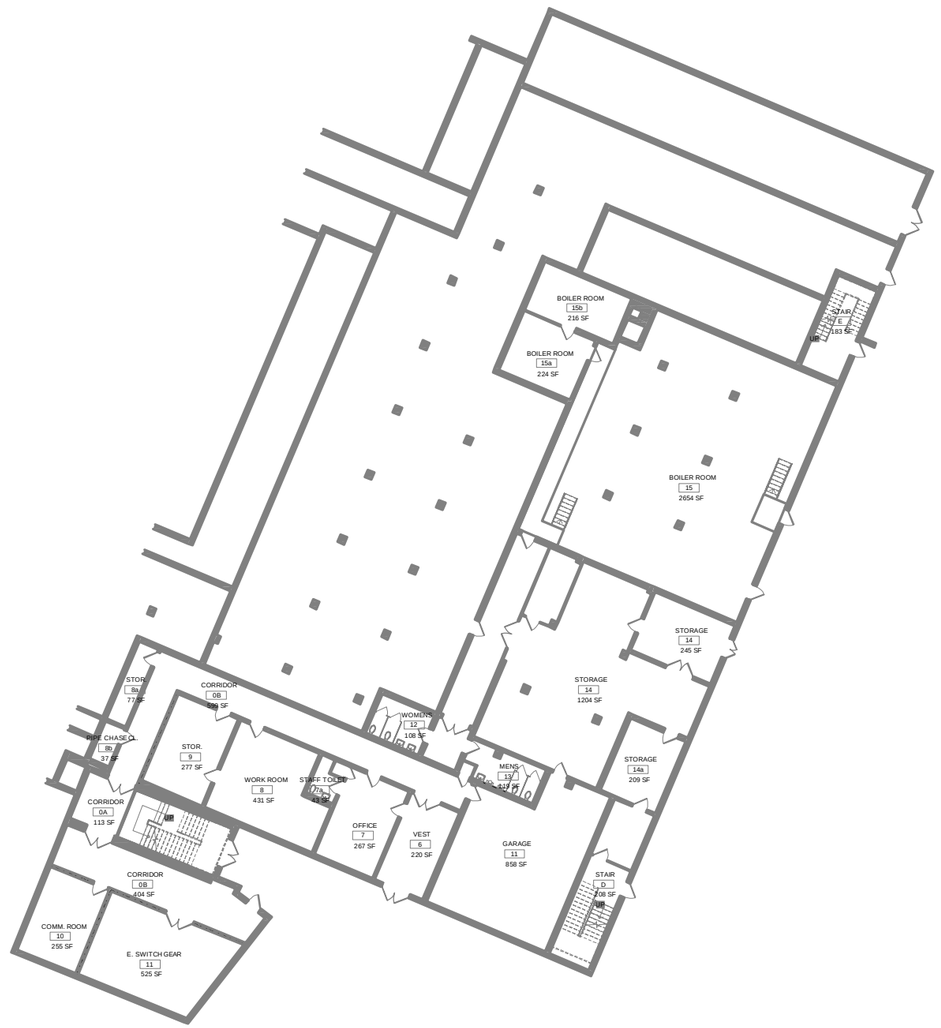
APPENDIX C:
ASBESTOS BULK SAMPLE LOCATION DRAWINGS



1 BASEMENT FLOOR PLAN - AREA C
SCALE: 3/32" = 1'-0"



3 BASEMENT FLOOR PLAN - AREA D
SCALE: 3/32" = 1'-0"



2 BASEMENT FLOOR PLAN - AREA B
SCALE: 3/32" = 1'-0"

BEDFORD CENTRAL SCHOOL DISTRICT
Every Single Student, Every Single Day

BEDFORD
CENTRAL SCHOOL
DISTRICT

632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL: 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

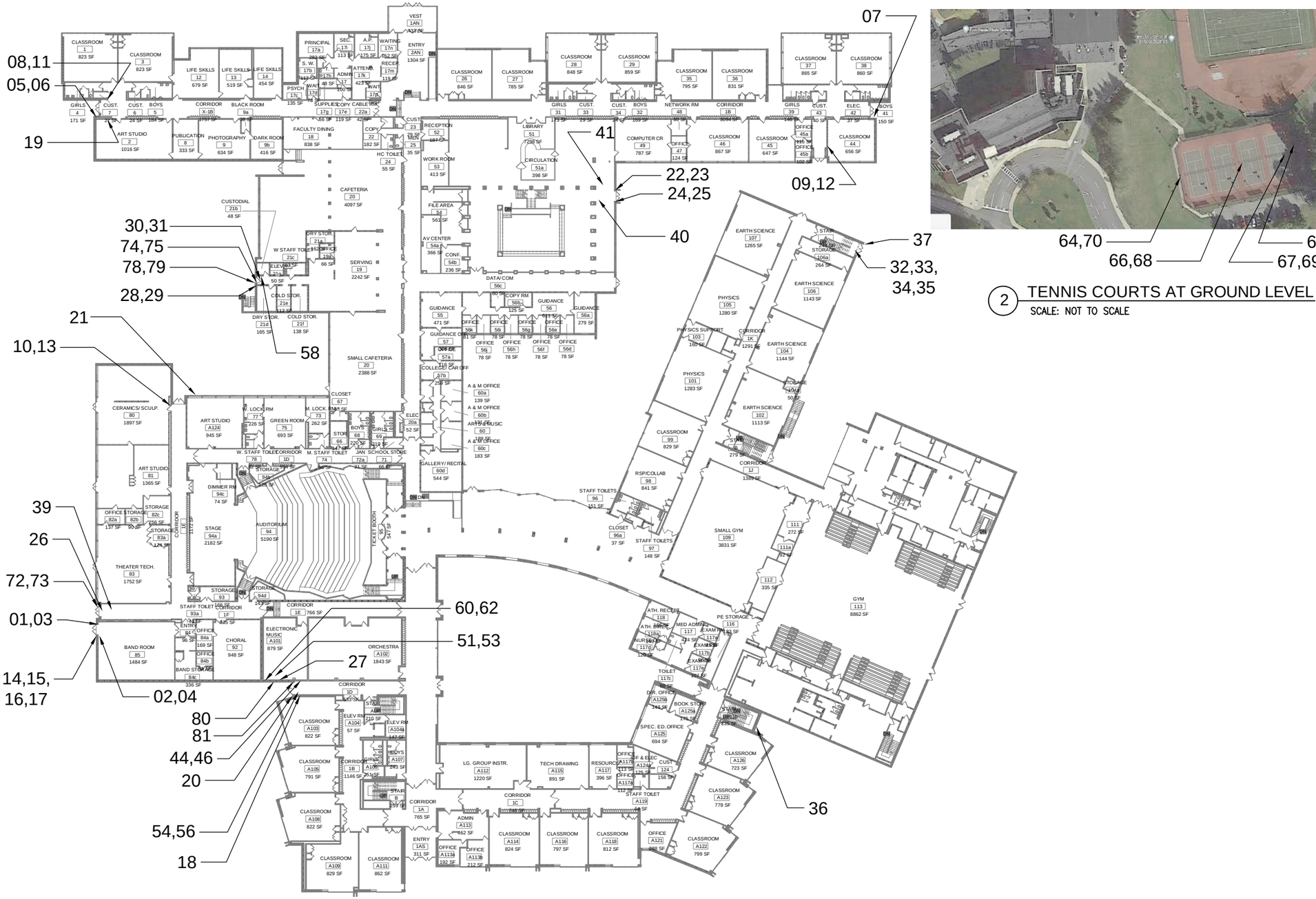
FOX LANE HIGH SCHOOL
SED SURVEY PROJECT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

DRAWING TITLE

BULK SAMPLE LOCATIONS
BASEMENT FLOOR PLAN

DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV.: J. GARCIA	DATE: 09/09/2022
CERTIFICATE NO. 03-04292	DRAWING NUMBER:
CHECKED BY: A.SMOLYAR	BSL001
	DRAWING NUMBER: 1 OF 4

CONSULTANTS PROJECT 31405320.010



2 TENNIS COURTS AT GROUND LEVEL
SCALE: NOT TO SCALE

1 FIRST FLOOR PLAN
SCALE: 1" = 20'-0"

BEDFORD CENTRAL SCHOOL DISTRICT
Every Single Student, Every Single Day

BEDFORD CENTRAL SCHOOL DISTRICT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

ENVIRONMENTAL CONSULTANT
WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 400
Valhalla, NY 10595
TEL: 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

FOX LANE HIGH SCHOOL
SED SURVEY PROJECT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

DRAWING TITLE
BULK SAMPLE LOCATIONS
FIRST FLOOR PLAN
& TENNIS COURTS AT
GROUND LEVEL

DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV.: J.GARCIA	DATE: 09/09/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A.SMOLYAR	BSL002
	DRAWING NUMBER 2 OF 4

CONSULTANTS PROJECT 31405320.011

1 SECOND FLOOR PLAN - AREA A
SCALE: 3/32" = 1'-0"

2 SECOND FLOOR PLAN - AREA C
SCALE: 3/32" = 1'-0"

BEDFORD CENTRAL SCHOOL DISTRICT
Every Single Student, Every Single Day

BEDFORD
CENTRAL SCHOOL
DISTRICT

632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL: 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

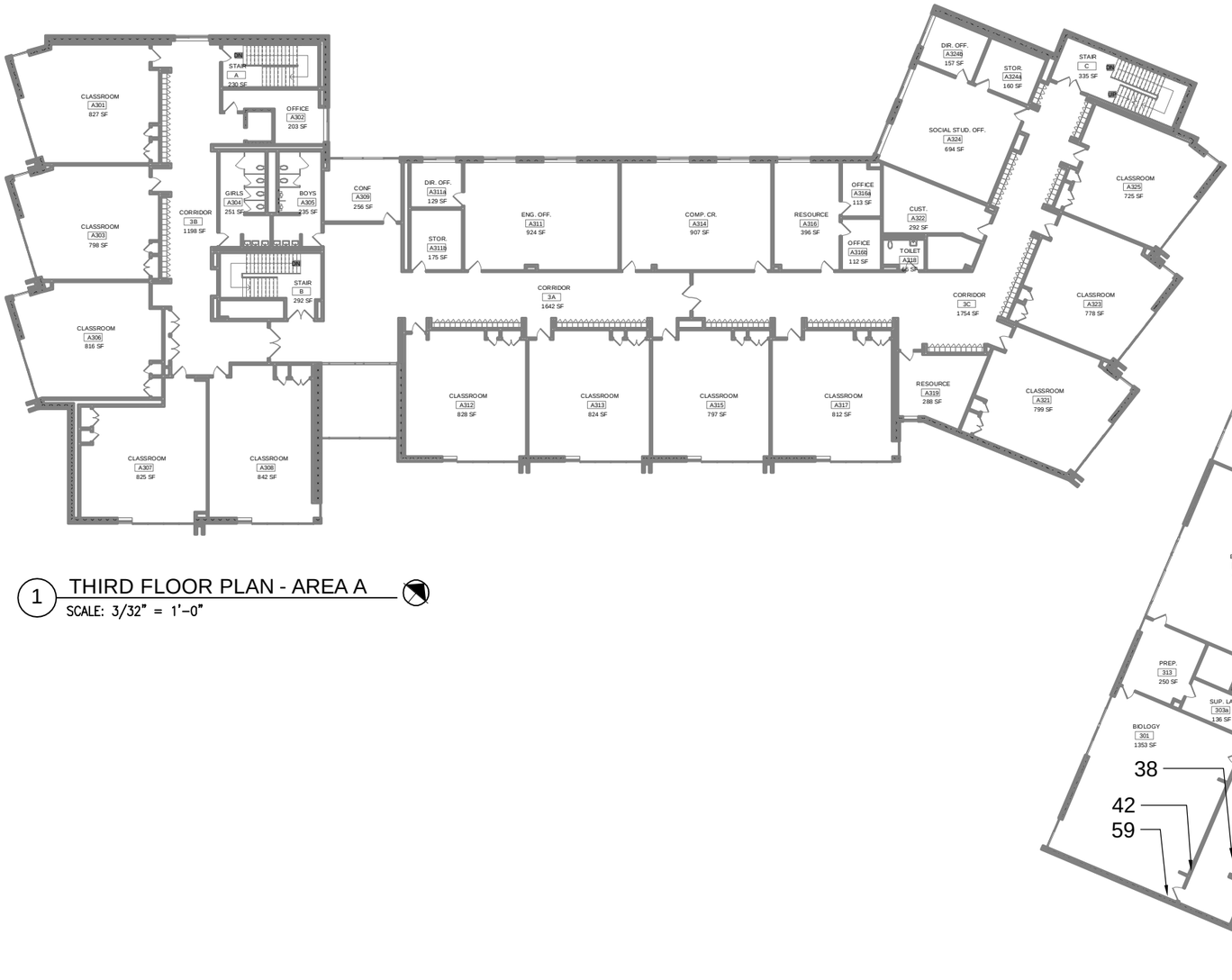
FOX LANE HIGH SCHOOL
SED SURVEY PROJECT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

DRAWING TITLE

BULK SAMPLE LOCATIONS
SECOND FLOOR PLAN

DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV.: J.GARCIA	DATE: 09/09/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A.SMOLYAR	BSL003
	DRAWING NUMBER: 3 OF 4

CONSULTANTS PROJECT 31405320.011



1 THIRD FLOOR PLAN - AREA A

SCALE: 3/32" = 1'-0"

2 THIRD FLOOR PLAN - AREA C

SCALE: 3/32" = 1'-0"

BEDFORD CENTRAL SCHOOL DISTRICT
Every Single Student, Every Single Day

BEDFORD CENTRAL SCHOOL DISTRICT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL. 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

FOX LANE HIGH SCHOOL
SED SURVEY PROJECT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

DRAWING TITLE

BULK SAMPLE LOCATIONS
SECOND FLOOR PLAN

DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV. J.GARCIA	DATE: 09/09/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A.SMOLYAR	BSL004
	DRAWING NUMBER 4 OF 4

CONSULTANTS PROJECT 31405320.011

APPENDIX D:
ASBESTOS CONTAINING MATERIALS LOCATION DRAWINGS
[NOT APPLICABLE]

APPENDIX E:
LEAD XRF SHOT RESULTS

XRF CALIBRATION CHECK FORM

PAGE 1 OF 1

PROJ. NO.:		DATE:	8/24/22
PROJECT NAME:		INSPECTOR NAME:	A. Smolyar
CLIENT:	Bedford CSD	INSPECTOR SIGNATURE:	
SITE:	Fox Lane HS	PROJ. MANAGER:	

LOUIS BERGER a WSP USA Company
TELEPHONE # : (212) 612-7900
FAX #: (212) 425-1618
ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014

XRF MAKE/MODEL: RMD LPA-1 (Serial#3675) Heuresis Pb200i (Serial#2150)

LLW#:

JOB#:

NOTES:

CALIBRATION CHECK – PRIOR TO LEAVING OFFICE

1.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 8:30	TEST #	1	2	3	
	XRF READING	1.1	0.7	0.6	

CALIBRATION CHECK – PRIOR TO LEAVING OFFICE

0.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 8:35	TEST #	4	5	6	
	XRF READING	0.0	0.0	0.1	

CALIBRATION CHECK – FIELD-START

____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME:	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

1.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 11:20	TEST #	37	38	39	
	XRF READING	1.1	1.0	1.0	

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

0.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 11:25	TEST #	40	41	42	
	XRF READING	0.0	0.0	0.1	

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME:	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME:	TEST #				
	XRF READING				

XRF LEAD-BASED PAINT TESTING DATA SHEET/CHAIN OF CUSTODY

PROJECT NO.:
CLIENT: Bedford CSD
INSPECTOR(S): A. Smolyar
PROJ. MANAGER:

PROJECT NAME:
PROJECT LOCATION: Fox Lane H.S
INSPECTION DATE: 8/24/22

SPACE CHARACTERISTICS:
FLOOR #: _____ ROOM #: _____ ROOM NAME: _____

NOTES:

SAMPLE #	SUBSTRATE	COMPONENT DISCRIPTION: COLOR	CONDITION [I / F / P]	COMPONENT	WALL/SIDE DESIGN.	SIDE [L/C/R]	HEIGHT [L/M/U]	COMPONENT REPLICANT	QUANTITY (IF POSITIVE) [SF]	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	XRF READING [mg/cm²]
7	M PL S C CB PG CR B W V CT (G) FG OTHER:	beige	G	WALL	A B C D RM CTR FL CL						Cor. 1D-A	0.3
8	(M) PL S C CB PG CR B W V CT G FG OTHER:	gray	G	DF	A B C D RM CTR FL CL							0.4
9	M PL S C (CB) PG CR B W V CT G FG OTHER:	gray/beige	G	WALL	A B C D RM CTR FL CL				glazed block			0.0
10	(M) PL S C CB PG CR B W V CT G FG OTHER:	beige	G	EDF	A B C D RM CTR FL CL							-0.1
11	(M) PL S C CB PG CR B W V CT G FG OTHER:	beige	G	EDoor	A B C D RM CTR FL CL							0.1
12	M PL S C CB PG CR B W V CT (G) FG OTHER:	beige	G	WALL	A B C D RM CTR FL CL						A101	0.2
13	M PL S C CB PG CR B W (V) CT G FG OTHER:	beige		BB	A B C D RM CTR FL CL						A101	0.1
14	(M) PL S C CB PG CR B W V CT G FG OTHER:	beige		DOOR	A B C D RM CTR FL CL						Cor 1F	0.0
15	(M) PL S C CB PG CR B W V CT G FG OTHER:	purple		DF	A B C D RM CTR FL CL						↓	0.3
16	M PL S C CB PG CR B W V CT G FG OTHER:	beige		E. Inlet	A B C D RM CTR FL CL						BANDOS	0.0
17	(M) PL S C CB PG CR B W V CT G FG OTHER:	purple		Door	A B C D RM CTR FL CL						↓	0.0
18	M (PL) S C CB PG CR B W V CT G FG OTHER:	beige		WALL	A B C D RM CTR FL CL						Corr 1E	0.3
19	(M) PL S C CB PG CR B W V CT G FG OTHER:	green		Door	A B C D RM CTR FL CL						Cold St. 2IE	0.2
20	M PL S C (CB) PG CR B W V CT G FG OTHER:	green		WALL	A B C D RM CTR FL CL						|	0.3
21	M PL S (C) CB PG CR B W V CT G FG OTHER:	green		Door Inlet	A B C D RM CTR FL CL						Int | ↓	3.2
22	M PL S C CB PG CR B W V CT G FG OTHER: g.b.	brown/beige		WALL	A B C D RM CTR FL CL						Cor 4B	0.3
23	(M) PL S C CB PG CR B W V CT G FG OTHER:	gray		Door	A B C D RM CTR FL CL						Cor 1K	-0.1
24	(M) PL S C CB PG CR B W V CT G FG OTHER:	↓		DF	A B C D RM CTR FL CL						|	0.0
25	(M) PL S C CB PG CR B W V CT G FG OTHER:	↓		DL	A B C D RM CTR FL CL						↓	0.3
26	(M) PL S C CB PG CR B W V CT G FG OTHER:	red		DR, DF	A B C D RM CTR FL CL						library	0.2

Side: Left/Center/Right; Height: Lower/Middle/Upper; Substrate: M: Metal; PL: Plaster; S: Sheetrock; C: Concrete; CB: Cinder Block; CR: Sinks, Water Closets, etc.; CT: Ceramic Tile; PG: Porcelain-glazed Block; B: Brick; W: Wood; V: Vinyl; FG: Fiberglass; G: Glass ; Condition: I = Intact; F = Fair; P = Poor; Initial Result: P = Positive; N = Negative;

XRF LEAD-BASED PAINT TESTING DATA SHEET/CHAIN OF CUSTODY

wsp

PROJECT NO.:
CLIENT: Bedford CSD
INSPECTOR(S): A. Smolyar
PROJ. MANAGER:

PROJECT NAME:
PROJECT LOCATION: Fox Lane HS.
INSPECTION DATE: 8/24/22

SPACE CHARACTERISTICS:

FLOOR #: ______ ROOM #: ______ ROOM NAME: ______

NOTES:

SAMPLE #	SUBSTRATE	COLOR	CONDITION [I / F / P]	COMPONENT	WALL/SIDE DESIGN.	SIDE [L/C/R]	HEIGHT [L/M/U]	COMPONENT REPLICANT	QUANTITY (IF POSITIVE) [SF]	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	XRF READING [mg/cm²]
27	M PL S C CB PG CR B W V CT G FG OTHER:	Red	G	WALL	A B C D RM CTR FL CL						Fitness Room	0.7
28	M PL S C CB PG CR B W V CT G FG OTHER:	white	↓	WALL	A B C D RM CTR FL CL						Fitness Room	0.1
29	M PL S C CB PG CR B W V CT G FG OTHER:	[illegible]	↓	DR	A B C D RM CTR FL CL						↓	-0.1
30	M PL S C CB PG CR B W V CT G FG OTHER:	↓	↓	DF	A B C D RM CTR FL CL						↓	0.0
31	M PL S C CB PG CR B W V (CT) G FG OTHER:	Brown	G	WALL	A B C D RM CTR FL CL						Rm 202	0.4
32	(M) PL S C CB PG CR B W V CT G FG OTHER:	gray	↓	DF	A B C D RM CTR FL CL						↓	0.0
33	(M) PL S C CB PG CR B (W) V CT G FG OTHER:	Varnish	↓	Door	A B C D RM CTR FL CL						↓	0.1
34	M PL S C CB PG CR B W V CT (G) FG OTHER:	green	G	WALL	A B C D RM CTR FL CL						Hallway 2A	0.2
35	M PL S C CB PG CR B W V CT G FG OTHER: Cb	Beige/Brown	G	↓	A B C D RM CTR FL CL						↓	0.1
36	M PL S C (CB) PG CR B W V CT G FG OTHER:	tan	G	WALL	A B C D RM CTR FL CL						Girls Bath	-0.1
~~37~~	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							

Side: Left/Center/Right; **Height**: Lower/Middle/Upper; **Substrate**: M: Metal; PL: Plaster; S: Sheetrock; C: Concrete; CB: Cinder Block; CR: Sinks, Water Closets, etc.; CT: Ceramic Tile; PG: Porcelain-glazed Block; B: Brick; W: Wood; V: Vinyl; FG: Fiberglass; G: Glass; **Condition**: I = Intact; F = Fair; P = Poor; Initial Result: P = Positive; N = Negative;

APPENDIX F:
PCB BULK SAMPLE FIELD DATA SHEETS WITH CHAIN OF CUSTODY & LABORATORY RESULTS

Technical Report

prepared for:

WSP USA (New York, NY)
One Penn Plaza, 2nd Floor
New York NY, 10119
Attention: Alexander Smolyar

Report Date: 09/06/2022
Client Project ID: 31405320.012 Fox Lane H.S
York Project (SDG) No.: 22H1647

Report Date: 09/06/2022
Client Project ID: 31405320.012 Fox Lane H.S
York Project (SDG) No.: 22H1647

WSP USA (New York, NY)
One Penn Plaza, 2nd Floor
New York NY, 10119
Attention: Alexander Smolyar

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on August 29, 2022 and listed below. The project was identified as your project: **31405320.012 Fox Lane H.S**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Sample and Analysis Qualifiers section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the Sample and Data Qualifiers Relating to This Work Order section of this report and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
22H1647-01	A-1/2/3	Caulk	08/24/2022	08/29/2022
22H1647-02	B-4/5/6	Caulk	08/24/2022	08/29/2022
22H1647-03	C-7/8/9	Caulk	08/24/2022	08/29/2022
22H1647-04	D-10/11/12	Caulk	08/24/2022	08/29/2022
22H1647-05	E-13/14/15	Caulk	08/24/2022	08/29/2022
22H1647-06	F-16/17/18	Caulk	08/24/2022	08/29/2022

General Notes for York Project (SDG) No.: 22H1647

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All analyses conducted met method or Laboratory SOP requirements. See the Sample and Data Qualifiers Section for further information.
6. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
7. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.
8. Analyses conducted at York Analytical Laboratories, Inc. Stratford, CT are indicated by NY Cert. No. 10854; those conducted at York Analytical Laboratories, Inc., Richmond Hill, NY are indicated by NY Cert. No. 12058.

Approved By: 

Date: 09/06/2022

Cassie L. Mosher
Laboratory Manager

Sample Information

Client Sample ID: A-1/2/3 **York Sample ID:** 22H1647-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB) **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:42	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:42	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:42	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:42	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:42	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:42	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:42	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,NJDEP	09/05/2022 17:42	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,NJDEP	09/05/2022 17:42	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 17:42	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*97.0 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*104 %*	*30-140*

Sample Information

Client Sample ID: B-4/5/6 **York Sample ID:** 22H1647-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB) **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:55	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:55	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:55	BJ

Sample Information

Client Sample ID: B-4/5/6 **York Sample ID:** 22H1647-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
53469-21-9	Aroclor 1242	ND		mg/kg	0.403	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 17:55	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.403	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 17:55	BJ
11097-69-1	**Aroclor 1254**	**0.495**		mg/kg	0.403	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 17:55	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.403	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 17:55	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.403	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 17:55	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.403	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 17:55	BJ
1336-36-3	*** Total PCBs**	**0.495**		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 17:55	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*102 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*112 %*	*30-140*

Sample Information

Client Sample ID: C-7/8/9 **York Sample ID:** 22H1647-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
11097-69-1	**Aroclor 1254**	**0.490**		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ

Sample Information

Client Sample ID: C-7/8/9 **York Sample ID:** 22H1647-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
37324-23-5	Aroclor 1262	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
1336-36-3	*** Total PCBs**	**0.490**		mg/kg	0.327	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 18:09	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*98.0 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*118 %*	*30-140*

Sample Information

Client Sample ID: D-10/11/12 **York Sample ID:** 22H1647-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.350	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 18:22	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*90.5 %*	*30-140*

Sample Information

Client Sample ID: D-10/11/12 **York Sample ID:** 22H1647-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
2051-24-3	*Surrogate: Decachlorobiphenyl*	*98.0 %*			*30-140*					

Sample Information

Client Sample ID: E-13/14/15 **York Sample ID:** 22H1647-05

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.273	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 18:36	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*99.0 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*112 %*	*30-140*

Sample Information

Client Sample ID: F-16/17/18 **York Sample ID:** 22H1647-06

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.413	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 18:49	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*51.0 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*69.0 %*	*30-140*

Analytical Batch Summary

Batch ID: BI20099 **Preparation Method:** EPA 3550C **Prepared By:** KEO

YORK Sample ID	Client Sample ID	Preparation Date
22H1647-01	A-1/2/3	09/02/22
22H1647-02	B-4/5/6	09/02/22
22H1647-03	C-7/8/9	09/02/22
22H1647-04	D-10/11/12	09/02/22
22H1647-05	E-13/14/15	09/02/22
22H1647-06	F-16/17/18	09/02/22
BI20099-BLK1	Blank	09/02/22
BI20099-BS1	LCS	09/02/22
BI20099-BSD1	LCS Dup	09/02/22

Polychlorinated Biphenyls by GC/ECD - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BI20099 - EPA 3550C											
Blank (BI20099-BLK1)								Prepared: 09/02/2022 Analyzed: 09/05/2022			
Aroclor 1016	ND	0.455	mg/kg								
Aroclor 1221	ND	0.455	"								
Aroclor 1232	ND	0.455	"								
Aroclor 1242	ND	0.455	"								
Aroclor 1248	ND	0.455	"								
Aroclor 1254	ND	0.455	"								
Aroclor 1260	ND	0.455	"								
Aroclor 1262	ND	0.455	"								
Aroclor 1268	ND	0.455	"								
Total PCBs	ND	0.455	"								
Surrogate: Tetrachloro-m-xylene	*1.65*		*"*	*1.82*		*90.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*1.69*		*"*	*1.82*		*93.0*	*30-140*				
LCS (BI20099-BS1)								Prepared: 09/02/2022 Analyzed: 09/05/2022			
Aroclor 1016	7.97	0.455	mg/kg	9.09		87.6	40-130				
Aroclor 1260	8.40	0.455	"	9.09		92.4	40-130				
Surrogate: Tetrachloro-m-xylene	*1.75*		*"*	*1.82*		*96.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*1.93*		*"*	*1.82*		*106*	*30-140*				
LCS Dup (BI20099-BSD1)								Prepared: 09/02/2022 Analyzed: 09/05/2022			
Aroclor 1016	7.12	0.455	mg/kg	9.09		78.3	40-130		11.2	25	
Aroclor 1260	7.37	0.455	"	9.09		81.1	40-130		13.1	25	
Surrogate: Tetrachloro-m-xylene	*1.54*		*"*	*1.82*		*84.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*1.58*		*"*	*1.82*		*87.0*	*30-140*				
Batch Y2I0605 - BI20097											
Aroclor Reference (Y2I0605-ARC1)								Prepared & Analyzed: 09/05/2022			
Surrogate: Tetrachloro-m-xylene	*0.211*		*ug/mL*	*0.200*		*106*					
Surrogate: Decachlorobiphenyl	*0.210*		*"*	*0.200*		*105*					

Sample and Data Qualifiers Relating to This Work Order

Definitions and Other Explanations

*	Analyte is not certified or the state of the samples origination does not offer certification for the Analyte.
ND	NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
LOQ	LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence. This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon NELAC 2009 Standards and applies to all analyses.
LOD	LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.
MDL	METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.
Reported to	This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two. For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the LOD/MDL, with values between the LOD/MDL and the LOQ being "J" flagged as estimated results.

For analyses by EPA SW-846-8270D, the Limit of Quantitation (LOQ) reported for benzidine is based upon the lowest standard used for calibration and is not a verified LOQ due to this compound's propensity for oxidative losses during extraction/concentration procedures and non-reproducible chromatographic performance.

22647647

PCB SURVEY DATA SHEET/ CHAIN OF CUSTODY

WSP PROJ #: 31405320.012
CLIENT: Bedford School District
Project Site: Fox Lane H.S.
Project Manager: A. Smolyar

LOCATION(S) SURVEYED Int / Ext.
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/24/22
Inspector(s) J Garcia, D Klimossenko, A. Smolyar

WSP
TELEPHONE N0. : (212) 612-7900 **FAX N0.: (212) 363-4341**
ADDRESS: 96 Morton Street, 8 Floor, New York, NY 10014

RESULTS TO: Alexander.smolyar@wsp.

TURNAROUND TIME:
☐48 HR ☐72 H R ☐96 HR ☑120 HR

LAB SAMPLE NO.	HA	SAMPLE NO.	MATERIAL DESCRIPTION	SAMPLE LOCATION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
	A	1	Ext. floor expansion joint caulking	Corridor 1F		
	↓	2	sidewalk / saddle (gray)	↓		
	↓	3	↓	↓		
	B	4	Interior door frame	Rm 21E		
	↓	5	caulking (gray)	↓		
	↓	6	↓	↓		
	C	7	Interior Door frame	Fitness Room		
	↓	8	caulking (white)	Fitness Room		
	↓	9	↓	↓		
	d	10	Exterior Door frame	Room 21E		
	↓	11	caulking (gray)	↓		
	↓	12	↓	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
A. Smolyar		8/26/22			~~Ivan B~~	8/29/22	1531	I. B	~~Ivan B~~	8/29/22	1845
Received by: (print)	(Sign)	8/29/22	735	Received by: (print)	(Sign)	/ /	AM/PM	Received by: (print)	(Sign)	8/29/22	1845
		AM/PM		I. B						AM/PM	

LAB INSTRUCTIONS: create one (1) composite sample of each homogeneous material from equal mass portions (± 5%) of the three (3) sub-samples for extraction and analysis via EPA Method 8082 and report the Arochlors listed (Arochlor 1016, Arochlor 1221, Arochlor 1232, Arochlor 1242, Arochlor 1248, Arochlor 1254, Arochlor 1260). The laboratory shall target a PCB detection limit of 1 ppm

22H1647

PCB SURVEY DATA SHEET/ CHAIN OF CUSTODY

WSP PROJ #: 31405320.012
CLIENT: Bedford CSD
Project Site: Fox Lane HS
Project Manager: A. Smolyar

LOCATION(S) SURVEYED Int & Ext
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/24/22
Inspector(s) J. Garcia, D. Rinnosseanu, A. Smolyar

WSP
TELEPHONE N0. : (212) 612-7900 **FAX N0.: (212) 363-4341**
ADDRESS: 96 Morton Street, 8 Floor, New York, NY 10014

RESULTS TO:

TURNAROUND TIME:
☐48 HR ☐72 H R ☐96 HR ☑120 HR

LAB SAMPLE NO.	HA	SAMPLE NO.	MATERIAL DESCRIPTION	SAMPLE LOCATION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
	e	13	Exterior Door frame Caulking	Outside Rm A101		
	↓	14	Cmu	Corr. 1D Exit A		
	↓	15	↓	↓		
	f	16	Ext Door Silicone	Corr. 1J		
	↓	17	(white/clear)	↓		
	↓	18	↓	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
A. Smolyar		8/26/22					
		8/29/22		I. B		8/29/22 1531	
I. B		8/29/22				8/29/22 1545	

LAB INSTRUCTIONS: create one (1) composite sample of each homogeneous material from equal mass portions (± 5%) of the three (3) sub-samples for extraction and analysis via EPA Method 8082 and report the Arochlors listed (Arochlor 1016, Arochlor 1221, Arochlor 1232, Arochlor 1242, Arochlor 1248, Arochlor 1254, Arochlor 1260). The laboratory shall target a PCB detection limit of 1 ppm

APPENDIX G:
COMPANY LICENSE, PERSONAL CERTIFICATIONS AND LABORATORY ACCREDITATIONS

New York State – Department of Labor
Division of Safety and Health
License and Certificate Unit
State Campus, Building 12
Albany, NY 12240

ASBESTOS HANDLING LICENSE

WSP USA Solutions Inc.
4th Floor
One Penn Plaza

New York, NY 10119

FILE NUMBER: 19-132876
LICENSE NUMBER: 132876
LICENSE CLASS: RESTRICTED
DATE OF ISSUE: 03/31/2022
EXPIRATION DATE: 03/31/2023

Duly Authorized Representative – Craig Napolitano:

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Amy Phillips, Director
For the Commissioner of Labor

SH 432 (8/12)

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2023
Issued April 01, 2022

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MS. JACKIE DARVISH
ATLAS ENVIRONMENTAL LABS CORP
255 W 36TH STREET SUITE 1503
NEW YORK, NY 10018

NY Lab Id No: 11999

is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:

Miscellaneous

Asbestos in Friable Material	Item 198.1 of Manual
	EPA 600/M4/82/020
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)
Asbestos in Non-Friable Material-TEM	Item 198.4 of Manual
Asbestos-Vermiculite-Containing Material	Item 198.8 of Manual
Lead in Dust Wipes	EPA 7000B
Lead in Paint	EPA 7000B

Sample Preparation Methods

EPA 3050B

Serial No.: 64911

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Atlas Environmental Lab (Asbestos in Bulk)
255 W 36th Street Suite #1503
New York, NY 10018
Ms. Jackie Darvish
Phone: 212-563-0400 Fax: 212-563-0401
Email: jdarvish@atlasenvironmentallab.com
http://www.atlasenvironmentallab.com

ASBESTOS FIBER ANALYSIS — NVLAP LAB CODE 500092-0

Bulk Asbestos Analysis

Code	*Description*
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

Code	*Description*
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

For the National Voluntary Laboratory Accreditation Program

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 500092-0

Atlas Environmental Lab (Asbestos in Bulk)

New York, NY

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2021-10-01 through 2022-09-30

Effective Dates

For the National Voluntary Laboratory Accreditation Program

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

Atlas Environmental Lab

255 W 36th Street, Suite 1503, New York, NY 10018

Laboratory ID: LAP-208306

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA LAP), LLC accreditation to the ISO/IEC 17025:2017 international standard, General Requirements for the Competence of Testing and Calibration Laboratories in the following:

LABORATORY ACCREDITATION PROGRAMS

☑	**INDUSTRIAL HYGIENE**	Accreditation Expires: August 01, 2023
☑	**ENVIRONMENTAL LEAD**	Accreditation Expires: August 01, 2023
☑	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires: August 01, 2023
☐	**FOOD**	Accreditation Expires:
☐	**UNIQUE SCOPES**	Accreditation Expires:

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached Scope of Accreditation. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2017 and AIHA LAP, LLC requirements. This certificate is not valid without the attached Scope of Accreditation. Please review the AIHA LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

Cheryl O. Morton

Cheryl O Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision19.1: 07/28/2021

Date Issued: 07/28/2021

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2023
Issued April 01, 2022

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. ROBERT Q. BRADLEY
YORK ANALYTICAL LABORATORIES INC
120 RESEARCH DRIVE
STRATFORD, CT 06615

NY Lab Id No: 10854

is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards (2016) for the category ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved analytes are listed below:

Polychlorinated Biphenyls

Aroclor 1016 (PCB-1016)	EPA 8082A
Aroclor 1016 (PCB-1016) in Oil	EPA 8082A
Aroclor 1221 (PCB-1221)	EPA 8082A
Aroclor 1221 (PCB-1221) in Oil	EPA 8082A
Aroclor 1232 (PCB-1232)	EPA 8082A
Aroclor 1232 (PCB-1232) in Oil	EPA 8082A
Aroclor 1242 (PCB-1242)	EPA 8082A
Aroclor 1242 (PCB-1242) in Oil	EPA 8082A
Aroclor 1248 (PCB-1248)	EPA 8082A
Aroclor 1248 (PCB-1248) in Oil	EPA 8082A
Aroclor 1254 (PCB-1254)	EPA 8082A
Aroclor 1254 (PCB-1254) in Oil	EPA 8082A
Aroclor 1260 (PCB-1260)	EPA 8082A
Aroclor 1260 (PCB-1260) in Oil	EPA 8082A
Aroclor 1262 (PCB-1262)	EPA 8082A
Aroclor 1262 (PCB-1262) in Oil	EPA 8082A
Aroclor 1268 (PCB-1268)	EPA 8082A
Aroclor 1268 (PCB-1268) in Oil	EPA 8082A

Polynuclear Aromatic Hydrocarbons

Acenaphthene	EPA 8270D
	EPA 8270E
Acenaphthylene	EPA 8270D

Serial No.: 65074

01213 006064102 47

NEW YORK STATE OF OPPORTUNITY. Department of Labor

ALEXANDER SMOLYAR

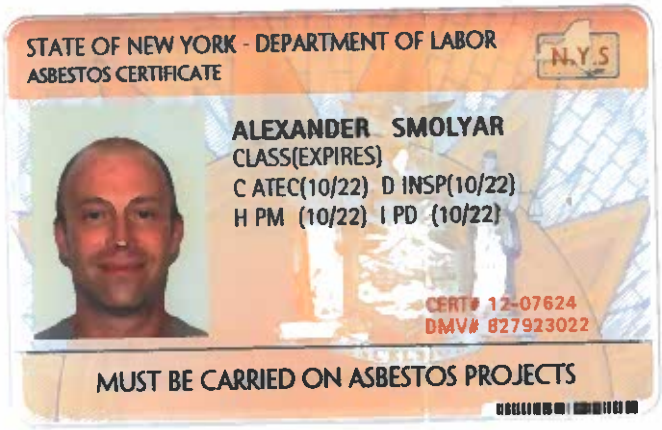
C/O LOUIS BERGER 96 MORTON ST, 8TH FL
NEW YORK NY 10014

Enclosed is your new card.

NYS Department of Labor

The Department of Labor is happy to provide this improved card. We welcome your comments: nysdol@labor.ny.gov or call (518) 457-2735

YOUR NEW CARD



United States Environmental Protection Agency

This is to certify that

Alexander Smolyar

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Risk Assessor

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires March 13, 2025

LBP-R-129050-2

Certification #

November 23, 2021

Issued On

Ben Conetta, Chief

Chemicals and Multimedia Programs Branch

01213 005960614 55

NEW YORK STATE OF OPPORTUNITY. Department of Labor

DMITRI KIRNOSSENKO

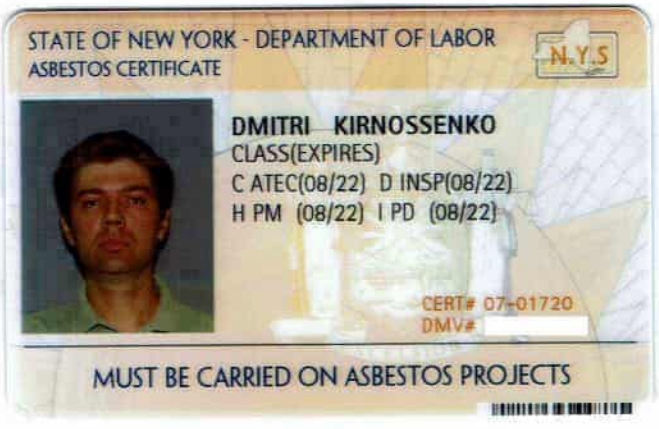
C/O LOUIS BERGER 96 MORTON ST 8TH FL
NEW YORK NY 10014

Enclosed is your new card.

NYS Department of Labor

The Department of Labor is happy to provide this improved card. We welcome your comments: nysdol@labor.ny.gov or call (518) 457-2735

YOUR NEW CARD



United States Environmental Protection Agency

This is to certify that

Dmitri Kirnossenko

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Inspector

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires October 01, 2023

LBP-I-16279-2

Certification #

June 19, 2020

Issued On

Ben Conetta, Chief

Chemicals and Multimedia Programs Branch

STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE

N.Y.S.

JOSUE GARCIA
CLASS(EXPIRES)
C ATEC(08/22) D INSP(08/22)
H PM (08/22) I PD (08/22)

CERT# 01-04282
DMV# 815004194

MUST BE CARRIED ON ASBESTOS PROJECTS

United States Environmental Protection Agency

This is to certify that

Josue Garcia

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Risk Assessor

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

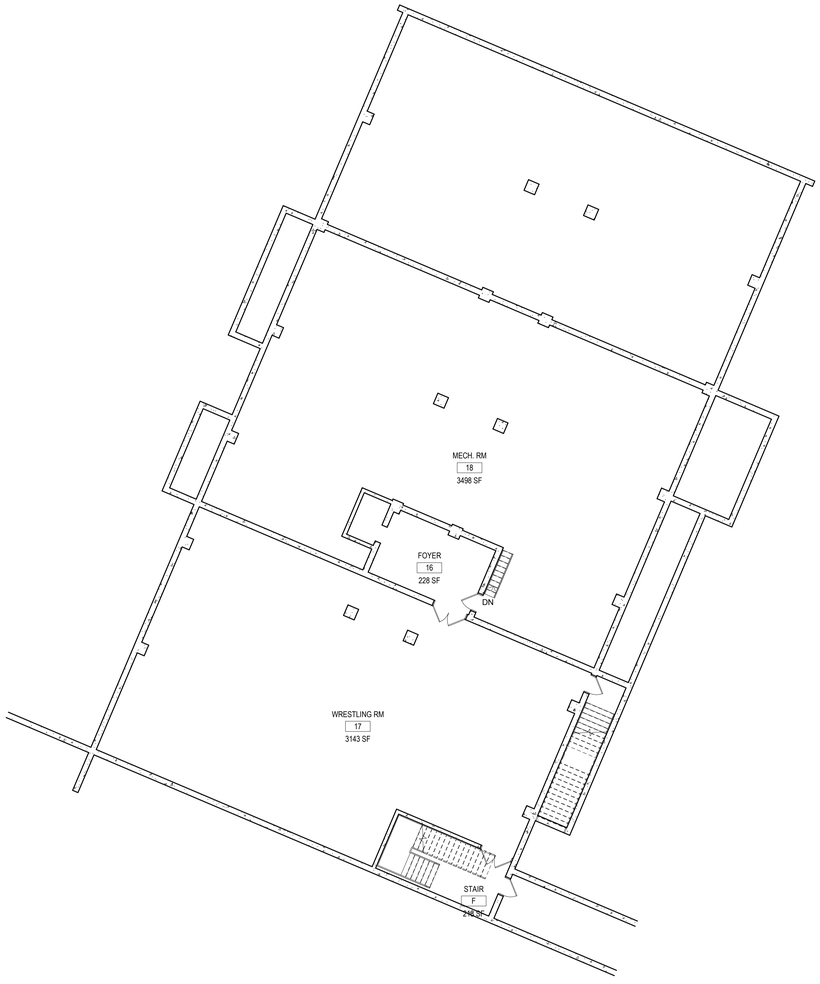
This certification is valid from the date of issuance and expires April 09, 2023

LBP-R-6928-2
Certification #

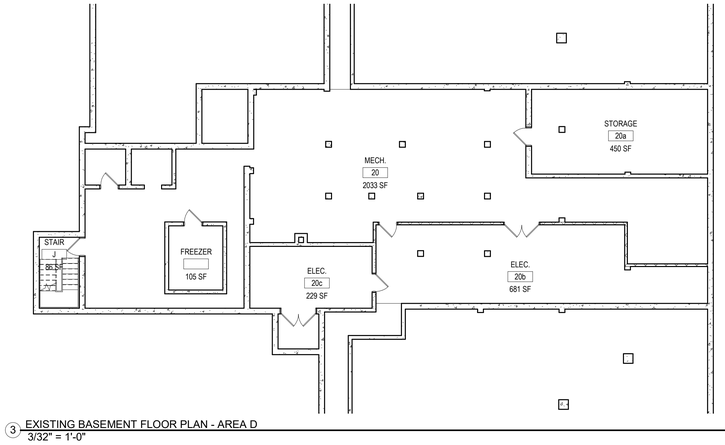
January 28, 2020
Issued On

Susan Schulz, Acting Chief
Chemicals and Multimedia Programs Branch

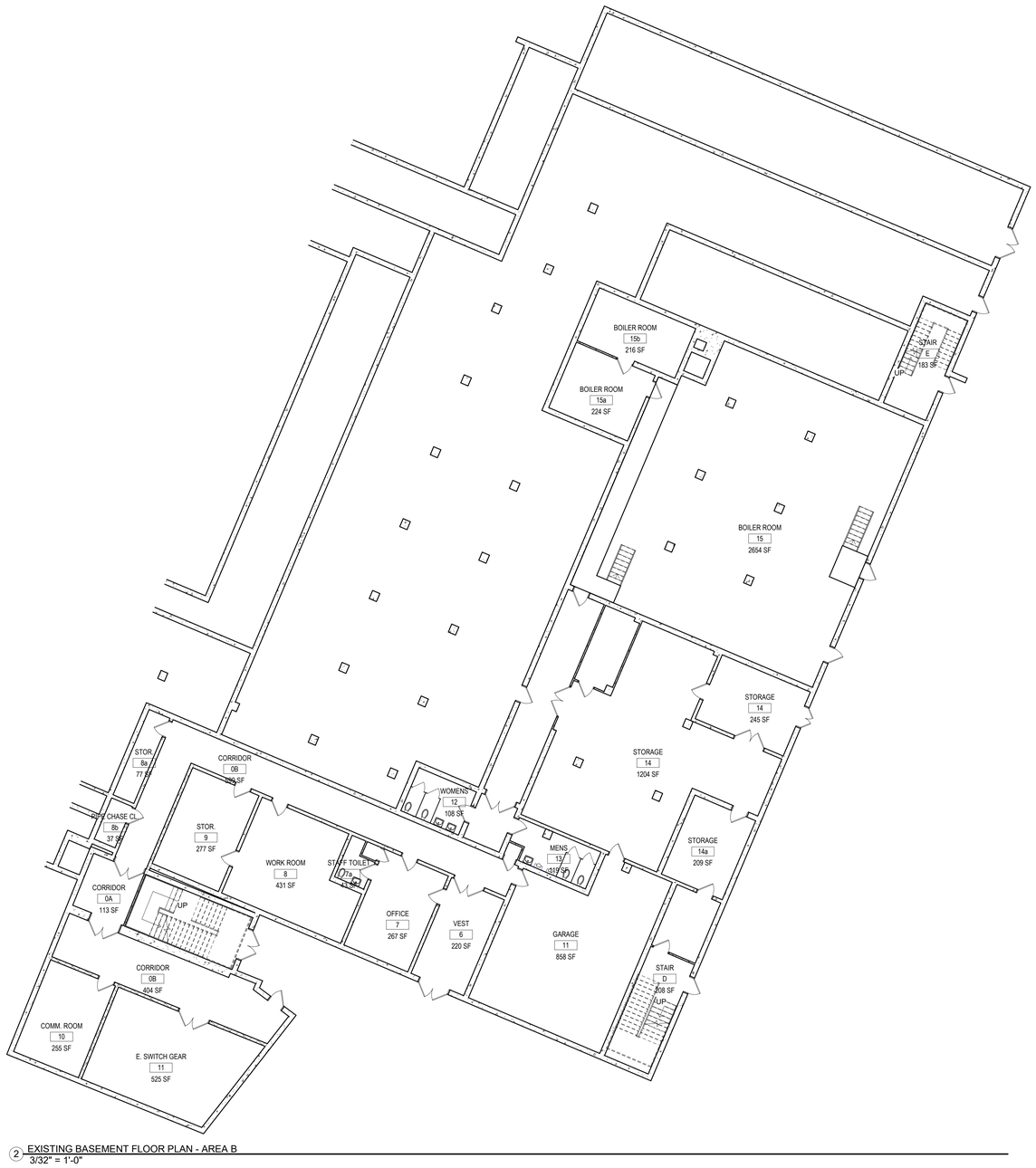
APPENDIX H:
SCOPE OF WORK DRAWINGS



1 EXISTING BASEMENT FLOOR PLAN - AREA C
3/32" = 1'-0"



3 EXISTING BASEMENT FLOOR PLAN - AREA D
3/32" = 1'-0"



2 EXISTING BASEMENT FLOOR PLAN - AREA B
3/32" = 1'-0"

EXISTING BASEMENT PLANS
FOX LANE HIGH SCHOOL
BEDFORD CSD

02/10/21

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS

= item 1.3 door and frame replacement, test exterior materials and interior ceiling/wall flooring materials

Fox Lane HS Phase 1 Projects - Scope of Work

1.1	Fox Lane High School	Athletics 1	Multi-Purpose Synthetic Turf Field & Baseball including bullpens, shelttered dugouts, field fencing, high netting, batting tunnel, accessible pathways, spectator seating, etc.
1.2	Fox Lane High School	FLHS A-1	Windows located on the south façade of the 2003 addition have had some water infiltration throughout the years since installation, looking at the lintel condition and brick above the lintel we suspect that the thru-wall flashing has been compromised allowing water infiltration Repair and more investigations are needed.3 floors
1.3	Fox Lane High School	FLHS A-7	Outdated rusted exterior metal Doors - Substitute with FRP Doors and Aluminum Frames
1.4	Fox Lane High School	FLHS A-9	Add walls/windows around security desk at north entry
1.5	Fox Lane High School	Athletics 4	HS Tennis Court Improvements
1.6	Fox Lane High School	FLHS M-2	Improve chemical storage room ventilation at second floor science classrooms
1.7	Fox Lane High School	FLHS M-3	Replace or modify induced draft fans at chimney to prevent products of combustion from being drawn into the school
1.8	Fox Lane High School	FLHS M-13	Provide air conditioning to 2nd and 3rd floor 'A Wing'
1.9	Fox Lane High School	FLHS M-14	Provide air conditioning to 2nd and 3rd floor 'C Wing'

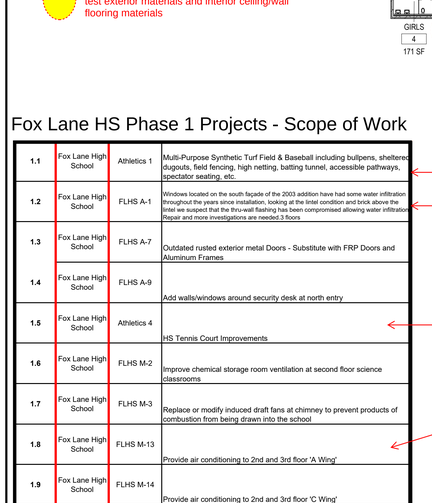
Item 1.1
No pre-con testing Required

Item 1.1
No pre-con testing Required
2003 addition

Item 1.5
Test surfacing material at tennis courts

Item 1.8
No pre-con testing Required
2003 addition

Item 1.4
Test suspected materials for new security room



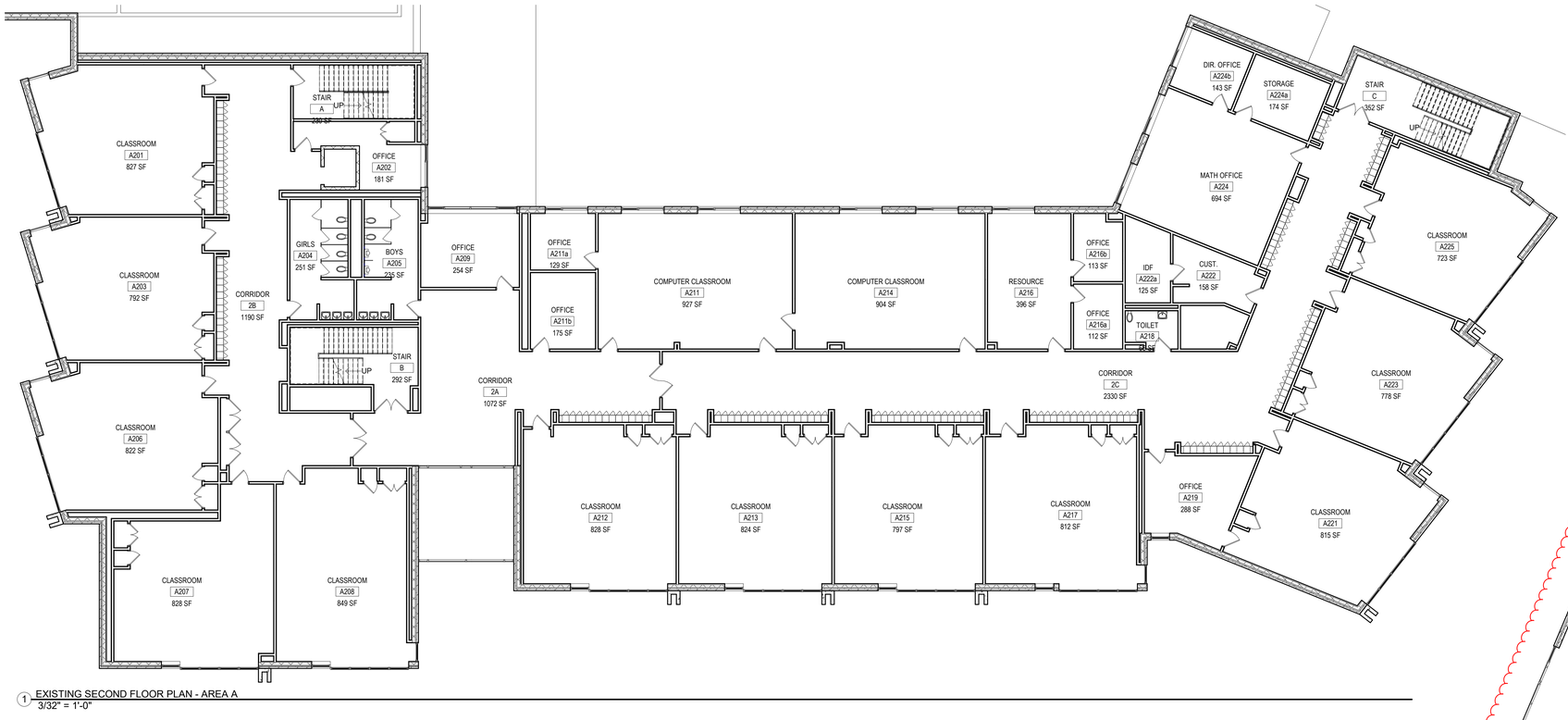
Vintage Plan

1 EXISTING FIRST FLOOR PLAN
3/64" = 1'-0"

EXISTING FIRST FLOOR PLAN
FOX LANE HIGH SCHOOL
BEDFORD CSD

11/24/20

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS



1 EXISTING SECOND FLOOR PLAN - AREA A
3/32" = 1'-0"

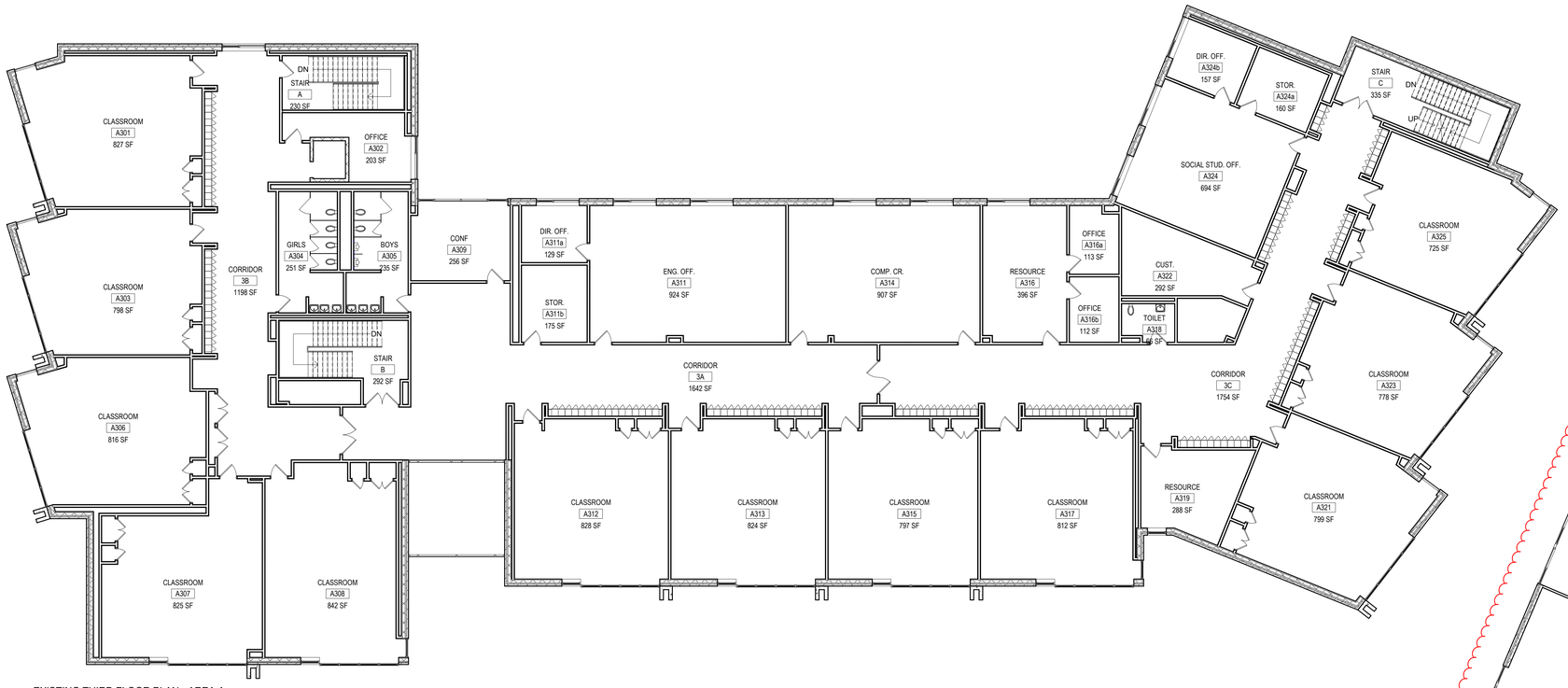
Item 1.9
test flooring, ceiling, walls.
new air conditioning will distiburb each.
test suspected materials in basement level housing equipment.

2 EXISTING SECOND FLOOR PLAN - AREA C
3/32" = 1'-0"

EXISTING SECOND FLOOR PLANS
FOX LANE HIGH SCHOOL
BEDFORD CSD

02/08/21

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS



1 EXISTING THIRD FLOOR PLAN - AREA A
3/32" = 1'-0"

Item 1.9
test flooring, ceiling, walls.
new air conditioning will distiburb each.
test suspected materials in basement level
housing equipment.

2 EXISTING THIRD FLOOR PLAN - AREA C
3/32" = 1'-0"

EXISTING THIRD FLOOR PLANS
FOX LANE HIGH SCHOOL
BEDFORD CSD

02/08/21

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS

APPENDIX I:
FILE SEARCH

ASBESTOS TRIENNIAL INSPECTION REPORT

for

FOX LANE HIGH SCHOOL

BEDFORD CENTRAL SCHOOL DISTRICT
Fox Lane Campus
Mount Kisco, New York 10528

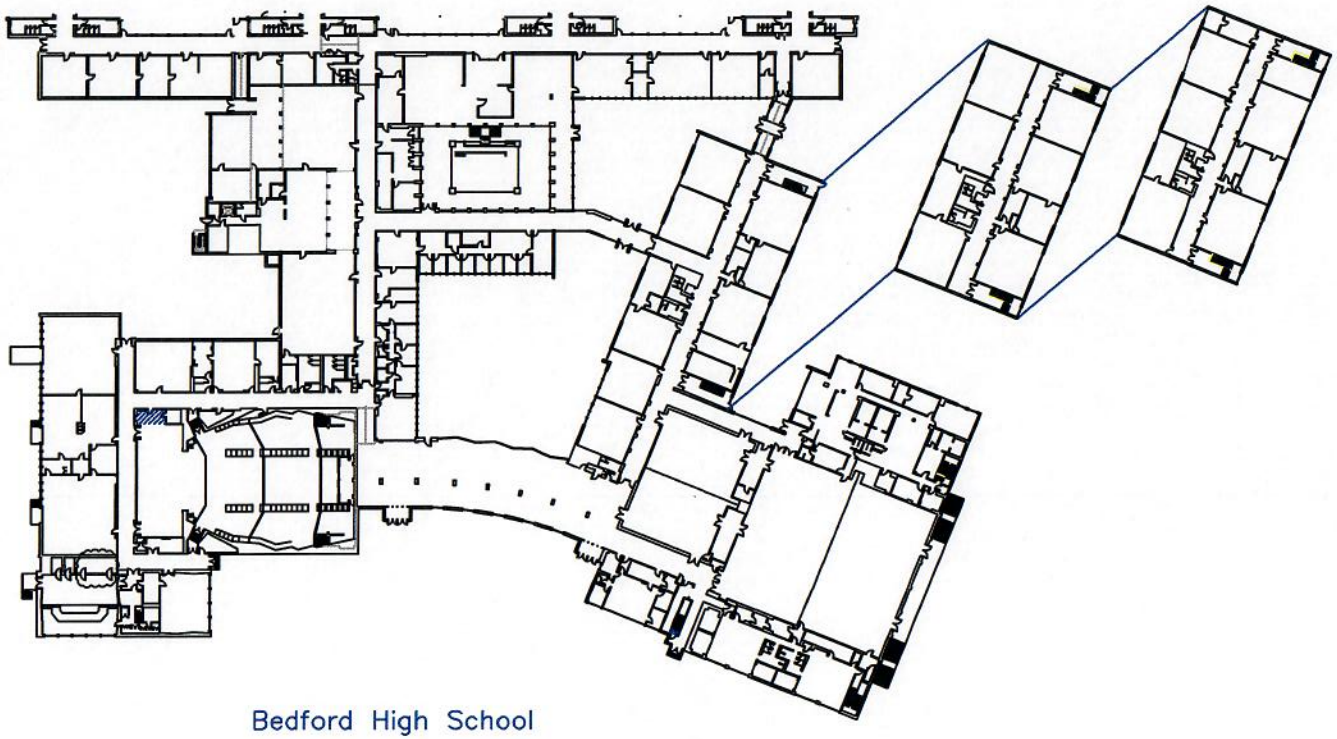
by

S & B ENVIRONMENTAL, LLC
7 Fairchild Road
Newtown CT. 06470

12 May 2019

Location of asbestos containing floor tiles & mastic

Asbestos containing floor tile is also located in the maintenance office, weight room, and carpentry shop located in the lower level of the building



Bedford High School

FINAL REPORT OF ENVIRONMENTAL SERVICES

Performed at:

FOX LANE MIDDLE SCHOOL
SED SURVEY PROJECT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

Prepared for:

BEDFORD CENTRAL SCHOOL DISTRICT
Inspiring and Challenging Our Students

632 South Bedford Road
Bedford, NY 10506

Prepared by:

WSP USA Solutions, Inc.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
Tel. (914) 747-1120

Project No. 31405320.012
Final Submission Date: September 23, 2022

September 23, 2022

Mr. Dennis Rankin
Director of Facilities
Bedford Central School District
632 South Bedford Road
Bedford, NY 10506

Subject: **Final Report of Environmental Services**
SED Survey Project
Fox Lane Middle School
632 South Bedford Road
Bedford, NY 10506

Dear Mr. Rankin:

WSP USA Solutions, Inc. has completed a material inspection at Fox Lane Middle School located at 632 South Bedford Road, Bedford, NY 10506. The inspection included visual observation, material sampling, and laboratory sample analysis of suspect Asbestos-Containing Materials (ACM), Lead Based Paints (LBP) and Polychlorinated Biphenyls (PCBs) as part of the SED Survey project at the Fox lane Middle School.

The attached report presents descriptions and results of the material sampling procedures and visual analysis. Relevant general project information is provided, followed by our findings, assessments and recommendations. Laboratory analysis data and certifications are provided in the Appendices.

If you have any questions concerning this report or if we may be of further assistance to you, please contact us.

Sincerely,

WSP USA SOLUTIONS, INC.

Steven Eget, PE
Vice President, Earth & Environment Downstate NY Business Line Leader

TABLE OF CONTENTS

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Appendices

1.0 EXECUTIVE SUMMARY

WSP USA Solutions, Inc. has performed a material inspection for the presence or absence of Asbestos-Containing Materials (ACM), Lead Based Paints (LBP) and Polychlorinated Biphenyls (PCBs) at the Fox Lane Middle School located at 632 South Bedford Road, Bedford, NY 10506. The intent of this inspection was to screen for ACM, LBP and PCBs that may be impacted during the SED Survey project at the school noted above.

Alex Smolyar, Dmitri Kirnossenko and Josue Garcia of WSP performed this inspection on August 25, 2022. Mr. Smolyar is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert#12-07624) and a licensed New York State EPA as a Lead Risk Assessor (Cert# LBP-R-129050-2). Mr. Kirnossenko is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert#07-01720) and a licensed New York State EPA as a Lead Inspector (Cert# LBP-I-16279-2). Mr. Garcia is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert#01-04292) and a licensed New York State EPA as a Lead Risk Assessor (Cert# LBP-R-6928-2).

The results of the visual inspection and bulk sample analysis determined that the following suspect ACM, LBP and PCB materials may be impacted by the proposed SED Survey project at the school noted above:

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 08/25/2022 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **Door Frame Tar (Black) – (Outdoor Play Area)**
- **Door Frame Tar (Black) – (Interior)**
- **9”x9” Floor Tile (Gray) – (Interior, Room 303)**
- **12”x12” Floor Tile (Dark Gray) – (Interior, 1st Floor)**

The following materials **Contain Asbestos as per AHERA Report:**

- **Floor Tiles & Mastic - Not Affected by Current SOW**

Analytical results of the bulk samples collected on 08/25/2022 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Asphalt (Black) – (Outdoor Play Area)
- Paint on Ceiling Wood Deck and Beams (White) – (Outdoor Play Area)
- Wall Paint (Red) – (Outdoor Play Area)
- Coat on Asphalt (White) – (Outdoor Play Area)
- Coat on Asphalt (Black) – (Outdoor Play Area)
- Tar at Crack Repair (Black) – (Outdoor Play Area)
- Exterior Brick Mortar (Red/Pink) – (Outdoor Play Area)
- Interior Brick Mortar (Dark Gray) – (Interior)

- Door Window Glazing (Dark Gray) – (Interior)
- 2'x4' Fissured Ceiling Tile (Beige/White) – (Interior)
- 2'x4' Fissured Ceiling Tile (Beige) – (Interior)
- 1'x1' Spline Ceiling Tile (Gray) – (Interior)
- Floor Ceramic Tile Mortar (Beige) – (Interior)
- Floor Ceramic Tile Mortar (Dark Gray) – (Interior)
- Gypsum (Gray) – (Interior)
- Joint Compound (White) – (Interior)
- Cinderblock Mortar (Gray) – (Interior)
- Ceramic Base Board Glue (Yellow) – (Interior)
- Ceramic Base Board Backing/Grout (Gray) – (Interior)
- Glazed Block Wall Mortar (Gray) – (Interior)
- Cove Base (Gray) – (Interior)
- Glue to Cove Base (Yellow) – (Interior)
- 16"x16" Floor Tile (Red) – (Interior)
- Mastic 16"x16" Floor Tile (Black) – (Interior)
- 12"x12" Floor Tile (Gray) – (Interior)
- 12"x12" Floor Tile (White) – (Interior)
- Mastic to 12"x12" Floor Tile (Black) – (Interior)
- Mastic to 9"x9" Floor Tile (Black) – (Interior)
- 12"x12" Floor Tile (Gray) – (Interior)
- Mastic to 12"x12" Gray Floor Tile (Black) – (Interior)
- Mastic to 12"x12" Floor Tile (Black) – (Interior, 1st Floor)

B. LEAD-BASED PAINT

Based upon XRF readings, lead has been confirmed to exist in the following tested combinations:

- **Black Paint on Cinderblock Baseboard (3rd Floor)**
- **Tan Paint on Ceramic Tile Wall (3rd Floor)**
- **White Paint on Ceramic Block Wall (3rd Floor)**
- **White Paint on Ceramic Tile Baseboard (3rd Floor)**
- **White Paint on Metal Beam (Outdoor Play Area)**
- **Gray Paint on Metal Column (Outdoor Play Area)**

Lead was **not detected** in the following tested combinations via XRF readings:

- Blue Paint on Cinderblock Wall (3rd Floor)
- Gray Paint on Metal Doo Frame (3rd Floor)
- Varnish Paint on Wood Door (3rd Floor)
- Black Paint on Metal Door Frame (3rd Floor)
- Beige Paint on Cinderblock Baseboard (3rd Floor)
- White Paint on Cinderblock Wall (3rd Floor)

- White Paint on Concrete Ceiling (3rd Floor)
- Mural Paint on Cinderblock Wall (3rd Floor)
- Beige Paint on Ceramic Tile Wall (3rd Floor)
- Blue Paint on Gypsum Wall (3rd Floor)
- White Paint on Concrete Ceiling (3rd Floor)
- Yellow Paint on Cinderblock Wall (3rd Floor)
- Gray Paint on Metal Door Frame (3rd Floor)
- Varnish Paint on Wood Door (3rd Floor)
- Red Paint on Cinderblock Wall (3rd Floor)
- Varnish Paint on Wood Baseboard (3rd Floor)
- Blue Paint on Gypsum Wall (3rd Floor)
- Varnish Paint on Wood Floor (3rd Floor)
- Brown Paint on Glazing Block Floor (2nd Floor)
- Gray Paint on Vinyl Baseboard (2nd Floor)
- White Paint on Cinderblock Wall (2nd Floor)
- Gray Paint on Metal Door Frame (2nd Floor)
- Varnish Paint on Wood Door (2nd Floor)
- White Paint on Gypsum Wall (2nd Floor)
- White Paint on Cinderblock Wall (1st Floor)
- Black Paint on Metal Door Frame (1st Floor)
- Varnish Paint on Wood Door (1st Floor)
- Red Paint on Concrete Wall (1st Floor)
- White Paint on Concrete Ceiling (1st Floor)
- White Paint on Wood Deck (Outdoor Play Area)
- Red Paint on Wood Wall (Outdoor Play Area)
- Black Paint on Wood Wall (Outdoor Play Area)
- Red Paint on Metal Door (Outdoor Play Area)
- Gray Paint on Metal Door Frame (Outdoor Play Area)
- Black Paint on Metal Fence (Outdoor Play Area)
- White Paint on Asphalt Floor (Outdoor Play Area)
- Black Paint on Asphalt Floor (Outdoor Play Area)

C. PCB-CONTAINING MATERIAL

Analytical results of the bulk samples collected indicate that the following materials **contain PCB** (greater than 50 PPM):

- No suspect caulking/glazing being affected by the UV Replacement project

Analytical results of the bulk samples collected indicate that the following materials **did not contain PCB** (less than 50 PPM):

- No suspect caulking/glazing being affected by the UV Replacement project

2.0 FIELD INSPECTION PROCEDURES AND SAMPLE ANALYSIS METHODS

A. ASBESTOS-CONTAINING MATERIAL

Guidelines used for the inspection were established by the Environmental Protection Agency (EPA) in the Guidance for Controlling Asbestos Containing Materials in Buildings, Office of Pesticides and Toxic Substances, Doc 560/5-85-024, and 40 CFR Part 763, Asbestos Hazard Emergency Response Act (AHERA).

Field information was organized in accordance with the AHERA methodology of homogenous area (HA). During the Inspection, reasonable effort was made to identify all locations and types of ACM materials associated with the scope of work. Sampling has included multiple samples of the same materials chosen at random. However, due to inconsistencies of a manufacturer's processes and the contractor's installation methods, materials of similar construction may contain various amounts of asbestos. Furthermore, some materials that were not originally specified to contain asbestos may in fact contain this mineral. For example, cementitious pipe insulation and plaster were frequently mixed with asbestos at the construction site for ease of application. Locating all asbestos materials can only be definitively achieved by conducting exploratory demolition and sampling every section of pipe insulation, fitting or valve covering, fireproofing, and other suspect ACM.

Bulk samples of suspect ACM are analyzed using polarized light microscopy (PLM) coupled with dispersion staining, as described in 40 CFR Part 763 and the National Emissions Standard for Hazardous Air Pollutants (NESHAPS). NESHAPS is the standard industry protocol for the determination of asbestos in building materials. A suspect material is immersed in a solution of known refractive index and subjected to illumination by polarized light. The color displays that result are compared to a standardized atlas whereby the specific variety of asbestos is determined. It should also be recognized that PLM is primarily a qualitative identification method whereby asbestos percentage, if any, is estimated. While EPA, New York State, and New York City regulations governing ACM consider materials containing greater then 1-percent as asbestos, accurately quantifying asbestos content below 5-percent has been shown to be unreliable.

The New York State Department of Health has recently revised the PLM Stratified Point Counting Method. The March 25th, 2011 method, "Polarized Light Microscopy Methods for Identifying and Quantifying Asbestos in Bulk Samples" can be found as Item 198.1 in the Environmental Laboratory Approval program (ELAP) Certification manual. Whereas the procedure of analysis for bulk samples that fall into the category of "Non-friable Organically Bound" (NOB) can be found in the March 25th 2011 method "Polarized-Light Microscope Method for Identifying and Quantifying Asbestos in Non-Friable Organically Bound Bulk Samples", Item 198.6 in the ELAP Certification Manual. This category includes any sample in a flexible to rigid asphalt or vinyl matrix (floor tiles, mastic, roofing shingles, roofing felt, etc.). These samples must be "ashed" in a muffle furnace at 480-degrees Celsius (to remove organic matrix), treated with acid (to remove any mineral carbonate), and filtered through a 0.4-micron polycarbonate filter before being analyzed by PLM. The sample must be weighted between each of these steps to track the percent loss of organic matrix.

ELAP has determined that analysis of NOB materials is not reliably performed by PLM. Therefore, if PLM analysis yields results of 1-percent asbestos or less, the result must be confirmed by TEM. For bulk samples that undergo TEM analysis, the March 25th, 2011 method "Transmission Electron Microscope Method for Identifying and Quantitating Asbestos in Non-Friable organically Bound Bulk Samples" must be used and can be found as Item 198.4 in the ELAP Certification Manual. ELAP certified laboratories must include the following statement with their PLM analysis results for each "negative" (1-percent or less asbestos) NOB sample: "Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Before this material can be considered or treated as non-ACM, confirmation must be made by quantitative transmission electron microscopy".

All samples are initially analyzed by Polarized Light Microscopy in accordance with Item 198.1 and 198.6 of the ELAP Certification Manual. Samples which yield a negative PLM result and which are classified as a "non-friable" material, are then re-analyzed utilizing TEM methodology in accordance with Item 198.4 of the ELAP Certification Manual. The laboratory performing both these analysis procedures Atlas Environmental Lab, Corp. located at 255 West 36th Street, New York, NY 10018. The laboratory has received accreditation from the following agencies:

- National Voluntary Laboratory Accreditation Program (Lab Code 500092-0)
- New York State Environmental Laboratory Approval Program (Lab No. 11999)
- American Industrial Hygiene Association Accredited Laboratory (Lab No. 208306)

B. LEAD-BASED PAINT

Painted surfaces within the space equivalents in the scope of work were identified and grouped together by component type, substrate and visible color. In similar fashion, the inspection continued in each space equivalent with the identification of unique combinations of component, substrate and visible color. A random representative area of each unique combination was sampled and tested. For each of these designated components, an area on the component was chosen which represents the paint on that building component. During the inspection, components that are accessible surfaces, friction surfaces, impact surfaces, or have deteriorated paint was identified.

The readings of paint surfaces were taken using Heuresis Pb200i and RMD LPA-1 XRF Lead Paint Spectrum Analyzers. The Heuresis and LPA-1 method of measurement is based on the spectrometric analysis of lead K-shell X-ray fluorescence within a controlled depth of interrogation. The Heuresis and LPA-1 Analyzers uses a Co-57 radioactive source and an advanced, solid-state, room temperature, radiation detector to generate and detect the x-ray fluorescence spectrum of a painted surface. The spectrum is then analyzed by a microprocessor to eliminate the effects of substrate and other factors such as scattering to allow an accurate determination of the amount of lead on a surface. The Heuresis and LPA-1 automatically analyzes spectrometric data in real time and differentiates the lead signal from the spectrum. The x-ray fluorescence properties are determined through calibration process and are used for automatic substrate correction and calculation of the lead content of a painted surface.

For quality control, the XRF instrument was calibrated using a U.S. Department of Commerce National Institute of Standards and Technology (NIST) Level III 1.0 mg/cm2 lead based paint film. For each calibration, three (3) XRF readings were taken on the paint film. The average of these three (3) readings was then subtracted from the known lead content in the paint film. The difference was compared with an Environmental Protection Agency (EPA)-approved tolerance range. Such calibration procedures were conducted at the start and at the end of the workday

C. POLYCHLORINATED BIPHENYLS (PCBs)

PCBs belong to a broad family of man-made organic chemicals known as chlorinated hydrocarbons. PCBs were domestically manufactured from 1929 until their manufacture was banned in 1979. They have a range of toxicity and vary in consistency from thin, light-colored liquids to yellow or black waxy solids. Due to their non-flammability, chemical stability, high boiling point, and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics, and rubber products; in pigments, dyes, and carbonless copy paper; and many other industrial applications.

Although no longer commercially produced in the United States, PCBs may be present in products and materials produced before the 1979 PCB ban. Products that may contain PCBs include: Transformers and capacitors, Oil used in motors and hydraulic systems, Fluorescent light ballasts, Adhesives and tapes, Caulking, Plastics, etc.

The PCBs used in these products were chemical mixtures made up of a variety of individual chlorinated biphenyl components, known as congeners. Most commercial PCB mixtures are known in the United States by their industrial trade names. The most common trade name is aroclor.

Polychlorinated biphenyls (PCBs) are regulated pursuant to the United States Environmental Protection Agency Code of Federal Regulations (40 CFR Part 761) and the Toxic Substances Control Act (TSCA – 15 U.S.C. 2605). These regulations require certain testing and reporting requirements to determine management, recycling and disposal options for PCBs.

3.0 INSPECTION SCOPE AND MATERIAL ASSESSMENT

The areas inspected for ACM materials that may be impacted by the proposed SED Survey project at the Fox Lane Middle School. Locations surveyed include:

- Throughout Building

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 08/25/2022 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **Door Frame Tar (Black) – (Outdoor Play Area)**

- **Door Frame Tar (Black) – (Interior)**
- **9”x9” Floor Tile (Gray) – (Interior, Room 303)**
- **12”x12” Floor Tile (Dark Gray) – (Interior, 1st Floor)**

The following materials **Contain Asbestos as per AHERA Report:**

- **Floor Tiles & Mastic - Not Affected by Current SOW**

Analytical results of the bulk samples collected on 08/25/2022 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Asphalt (Black) – (Outdoor Play Area)
- Paint on Ceiling Wood Deck and Beams (White) – (Outdoor Play Area)
- Wall Paint (Red) – (Outdoor Play Area)
- Coat on Asphalt (White) – (Outdoor Play Area)
- Coat on Asphalt (Black) – (Outdoor Play Area)
- Tar at Crack Repair (Black) – (Outdoor Play Area)
- Exterior Brick Mortar (Red/Pink) – (Outdoor Play Area)
- Interior Brick Mortar (Dark Gray) – (Interior)
- Door Window Glazing (Dark Gray) – (Interior)
- 2’x4’ Fissured Ceiling Tile (Beige/White) – (Interior)
- 2’x4’ Fissured Ceiling Tile (Beige) – (Interior)
- 1’x1’ Spline Ceiling Tile (Gray) – (Interior)
- Floor Ceramic Tile Mortar (Beige) – (Interior)
- Floor Ceramic Tile Mortar (Dark Gray) – (Interior)
- Gypsum (Gray) – (Interior)
- Joint Compound (White) – (Interior)
- Cinderblock Mortar (Gray) – (Interior)
- Ceramic Base Board Glue (Yellow) – (Interior)
- Ceramic Base Board Backing/Grout (Gray) – (Interior)
- Glazed Block Wall Mortar (Gray) – (Interior)
- Cove Base (Gray) – (Interior)
- Glue to Cove Base (Yellow) – (Interior)
- 16”x16” Floor Tile (Red) – (Interior)
- Mastic 16”x16” Floor Tile (Black) – (Interior)
- 12”x12” Floor Tile (Gray) – (Interior)
- 12”x12” Floor Tile (White) – (Interior)
- Mastic to 12”x12” Floor Tile (Black) – (Interior)
- Mastic to 9”x9” Floor Tile (Black) – (Interior)
- 12”x12” Floor Tile (Gray) – (Interior)
- Mastic to 12”x12” Gray Floor Tile (Black) – (Interior)
- Mastic to 12”x12” Floor Tile (Black) – (Interior, 1st Floor)

D. LEAD-BASED PAINT

Based upon XRF readings, lead has been confirmed to exist in the following tested combinations:

- **Black Paint on Cinderblock Baseboard (3rd Floor)**
- **Tan Paint on Ceramic Tile Wall (3rd Floor)**
- **White Paint on Ceramic Block Wall (3rd Floor)**
- **White Paint on Ceramic Tile Baseboard (3rd Floor)**
- **White Paint on Metal Beam (Outdoor Play Area)**
- **Gray Paint on Metal Column (Outdoor Play Area)**

Lead was **not detected** in the following tested combinations via XRF readings:

- Blue Paint on Cinderblock Wall (3rd Floor)
- Gray Paint on Metal Doo Frame (3rd Floor)
- Varnish Paint on Wood Door (3rd Floor)
- Black Paint on Metal Door Frame (3rd Floor)
- Beige Paint on Cinderblock Baseboard (3rd Floor)
- White Paint on Cinderblock Wall (3rd Floor)
- White Paint on Concrete Ceiling (3rd Floor)
- Mural Paint on Cinderblock Wall (3rd Floor)
- Beige Paint on Ceramic Tile Wall (3rd Floor)
- Blue Paint on Gypsum Wall (3rd Floor)
- White Paint on Concrete Ceiling (3rd Floor)
- Yellow Paint on Cinderblock Wall (3rd Floor)
- Gray Paint on Metal Door Frame (3rd Floor)
- Varnish Paint on Wood Door (3rd Floor)
- Red Paint on Cinderblock Wall (3rd Floor)
- Varnish Paint on Wood Baseboard (3rd Floor)
- Blue Paint on Gypsum Wall (3rd Floor)
- Varnish Paint on Wood Floor (3rd Floor)
- Brown Paint on Glazing Block Floor (2nd Floor)
- Gray Paint on Vinyl Baseboard (2nd Floor)
- White Paint on Cinderblock Wall (2nd Floor)
- Gray Paint on Metal Door Frame (2nd Floor)
- Varnish Paint on Wood Door (2nd Floor)
- White Paint on Gypsum Wall (2nd Floor)
- White Paint on Cinderblock Wall (1st Floor)
- Black Paint on Metal Door Frame (1st Floor)
- Varnish Paint on Wood Door (1st Floor)
- Red Paint on Concrete Wall (1st Floor)
- White Paint on Concrete Ceiling (1st Floor)
- White Paint on Wood Deck (Outdoor Play Area)

- Red Paint on Wood Wall (Outdoor Play Area)
- Black Paint on Wood Wall (Outdoor Play Area)
- Red Paint on Metal Door (Outdoor Play Area)
- Gray Paint on Metal Door Frame (Outdoor Play Area)
- Black Paint on Metal Fence (Outdoor Play Area)
- White Paint on Asphalt Floor (Outdoor Play Area)
- Black Paint on Asphalt Floor (Outdoor Play Area)

E. PCB-CONTAINING MATERIAL

Analytical results of the bulk samples collected indicate that the following materials **contain PCB** (greater than 50 PPM):

- No suspect caulking/glazing being affected by the UV Replacement project

Analytical results of the bulk samples collected indicate that the following materials **did not contain PCB** (less than 50 PPM):

- No suspect caulking/glazing being affected by the UV Replacement project

4.0 INSPECTION RESULTS

A. ASBESTOS-CONTAINING MATERIAL

The asbestos inspection involved a thorough visual examination of all areas that may be impacted by the proposed SED Survey project at the Fox Lane Middle School. The following suspect materials were sampled and analyzed for asbestos content by WSP:

4.1 Table 4.1 – Suspect Materials Inspected

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
WSP Sampled on 08/25/22			
A	Outdoor Play Area	Asphalt (Black)	NAD
B	**Outdoor Play Area**	**Door Frame Tar (Black)**	**11% Anthophyllite 2.8% Chrysotile**
C	Outdoor Play Area	Paint on Ceiling Wood Deck and Beams (White)	NAD
D	Outdoor Play Area	Wall Paint (Red)	NAD
E	Outdoor Play Area	Coat on Asphalt (White)	NAD
F	Outdoor Play Area	Coat on Asphalt (Black)	NAD
G	Outdoor Play Area	Tar at Crack Repair (Black)	NAD
H	Outdoor Play Area	Exterior Brick Mortar (Red/Pink)	NAD
I	Interior	Interior Brick Mortar (Dark Gray)	NAD

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
J	Interior	Door Window Glazing (Dark Gray)	Trace Chrysotile
K	Interior	2'x4' Fissured Ceiling Tile (Beige/White)	NAD
L	Interior	2'x4' Fissured Ceiling Tile (Beige)	NAD
M	Interior	1'x1' Spline Ceiling Tile (Gray)	NAD
N	Interior	Floor Ceramic Tile Mortar (Beige)	NAD
O	Interior	Floor Ceramic Tile Mortar (Dark Gray)	NAD
P	**Interior**	**Door Frame Tar (Black)**	**5% Chrysotile**
Q	Interior	Gypsum (Gray)	NAD
R	Interior	Joint Compound (White)	NAD
S	Interior	Cinderblock Mortar (Gray)	NAD
T	Interior	Ceramic Base Board Glue (Yellow)	NAD
U	Interior	Ceramic Base Board Backing/Grout (Gray)	NAD
V	Interior	Glazed Block Wall Mortar (Gray)	NAD
W	Interior	Cove Base (Gray)	NAD
X	Interior	Glue to Cove Base (Yellow)	NAD
Y	Interior	16"x16" Floor Tile (Red)	NAD
Z	Interior	Mastic 16"x16" Floor Tile (Black)	NAD
A1	Interior	12"x12" Floor Tile (Gray)	NAD
B1	Interior	12"x12" Floor Tile (White)	NAD
C1	Interior	Mastic to 12"x12" Floor Tile (Black)	NAD
D1	**Interior**	**9"x9" Floor Tile (Gray)**	**9.5% Chrysotile**
E1	Interior	Mastic to 9"x9" Floor Tile (Black)	NAD
F1	Interior	12"x12" Floor Tile (Gray)	NAD
G1	Interior	Mastic to 12"x12" Gray Floor Tile (Black)	NAD
H1	**Interior (1st Floor)**	**12"x12" Floor Tile (Dark Gray)**	**1.4% Chrysotile**
I1	Interior (1st Floor)	Mastic to 12"x12" Floor Tile (Black)	NAD
AHERA Report			
-	**Throughout**	**9"x9" Floor Tiles & Mastic**	**ACM**

Bold = Positive for ACM NAD = No Asbestos Detected NA/PS = Not analyzed/ positive sample

4.2 CONDITION AND FRIABLITY ASSESSMENT TABLE

For each inspection conducted, the inspector classifies ACM or Assumed ACM materials by friability and condition. This helps to determine the extent of damage in certain areas as well as the potential for further damage and Asbestos release due to disturbance of the material.

Table 4.2 – Condition and Friability Assessment

Location	Material	Quantity	Friability	Condition
Outdoor Play Area	Door Frame Tar (Black)	42 LF	Non-Friable	Good
Interior	Door Frame Tar (Black)	2,500 LF	Non-Friable	Good
Interior (1st Floor)	9”x9” Floor Tile & Mastic	300 SF	Non-Friable	Good
Interior (Room 303)	9”x9” Floor Tile (Gray)	20 SF	Non-Friable	Good
Interior (1st Floor)	12”x12” Floor Tile (Dark Gray)	20 SF	Non-Friable	Good

Condition Definitions:
Good: None/Minimal apparent damage to ACM
Fair: Up to 10% localized damage or up to 25% of the entire ACM is damaged
Poor: Over 10% localized damage or over 25% of the entire ACM is damaged

4.3 SAMPLE ANALYSIS TABLE

Laboratory analysis results, in tabular form, are included in Appendix A.

B. LEAD-BASED PAINT

The lead Inspection involved a thorough visual examination of all accessible areas impacted by the proposed SED Survey project at the Fox Lane Middle School. The following suspect surfaces were tested for lead content:

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
Previous WSP Report dated 08/25/22						
1	Calibration Check @ 1.0	---	---	---	---	1.0
2	Calibration Check @ 1.0	---	---	---	---	0.8
3	Calibration Check @ 1.0	---	---	---	---	1.1
4	Calibration Check @ 0.0	---	---	---	---	0.0

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
5	Calibration Check @ 0.0	---	---	---	---	0.1
6	Calibration Check @ 0.0	---	---	---	---	0.1
7	3rd Floor	Wall	Blue	Cinderblock	Intact	0.5
8	3rd Floor	Doo Frame	Gray	Metal	Intact	0.0
9	3rd Floor	Door	Varnish	Wood	Intact	0.1
10	3rd Floor	Door Frame	Black	Metal	Intact	0.5
11	3rd Floor	Baseboard	Beige	Cinderblock	Intact	0.1
12	3rd Floor	Wall	White	Cinderblock	Intact	0.5
13	3rd Floor	Ceiling	White	Concrete	Intact	0.1
14	**3rd Floor**	**Baseboard**	**Black**	**Cinderblock**	**Intact**	**1.2**
15	3rd Floor	Wall	Mural	Cinderblock	Intact	0.4
16	3rd Floor	Wall	Beige	Ceramic Tile	Intact	-0.1
17	3rd Floor	Wall	Blue	Gypsum	Intact	0.5
18	3rd Floor	Ceiling	White	Concrete	Intact	0.1
19	3rd Floor	Wall	Yellow	Cinderblock	Intact	-0.1
20	**3rd Floor**	**Wall**	**Tan**	**Ceramic Tile**	**Intact**	**1.1**
21	**3rd Floor**	**Wall**	**White**	**Ceramic Block**	**Intact**	**1.0**
22	3rd Floor	Door Frame	Gray	Metal	Intact	-0.1
23	3rd Floor	Door	Varnish	Wood	Intact	0.1
24	3rd Floor	Wall	Red	Cinderblock	Intact	0.2
25	3rd Floor	Baseboard	Varnish	Wood	Intact	-0.2
26	**3rd Floor**	**Baseboard**	**White**	**Ceramic Tile**	**Intact**	**1.3**
27	3rd Floor	Wall	Blue	Gypsum	Intact	0.1
28	3rd Floor	Floor	Varnish	Wood	Intact	-0.1
29	2nd Floor	Floor	Brown	Glazing Block	Intact	0.2
30	2nd Floor	Baseboard	Gray	Vinyl	Intact	0.5
31	2nd Floor	Wall	White	Cinderblock	Intact	0.1
32	2nd Floor	Door Frame	Gray	Metal	Intact	0.4
33	2nd Floor	Door	Varnish	Wood	Intact	0.0
34	2nd Floor	Wall	White	Cinderblock	Intact	0.1
35	2nd Floor	Wall	White	Gypsum	Intact	0.0
36	1st Floor	Wall	White	Cinderblock	Intact	0.1
37	1st Floor	Door Frame	Black	Metal	Intact	-0.1
38	1st Floor	Door	Varnish	Wood	Intact	0.0
39	1st Floor	Wall	Red	Concrete	Intact	0.2
40	1st Floor	Ceiling	White	Concrete	Intact	0.1

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
41	**Outdoor Play Area**	**Beam**	**White**	**Metal**	**Fair**	**2.1**
42	Outdoor Play Area	Deck	White	Wood	Fair	0.1
43	Outdoor Play Area	Deck	White	Wood	Fair	0.0
44	**Outdoor Play Area**	**Column**	**Gray**	**Metal**	**Fair**	**2.8**
45	Outdoor Play Area	Wall	Red	Wood	Fair	0.1
46	Outdoor Play Area	Wall	Black	Wood	Fair	0.1
47	Outdoor Play Area	Deck	White	Wood	Fair	0.1
48	Outdoor Play Area	Door	Red	Metal	Fair	-0.1
49	Outdoor Play Area	Door Frame	Gray	Metal	Fair	0.0
50	Outdoor Play Area	Fence	Black	Metal	Fair	-0.1
51	Outdoor Play Area	Floor	White	Asphalt	Fair	0.1
52	Outdoor Play Area	Floor	Black	Asphalt	Fair	0.0
53	Calibration Check @ 1.0	---	---	---	---	1.1
54	Calibration Check @ 1.0	---	---	---	---	0.9
55	Calibration Check @ 1.0	---	---	---	---	1.0
56	Calibration Check @ 0.0	---	---	---	---	0.0
57	Calibration Check @ 0.0	---	---	---	---	0.1
58	Calibration Check @ 0.0	---	---	---	---	0.1

C. PCB-CONTAINING MATERIAL

The PCB Inspection involved a thorough visual examination of all areas that may be impacted by the proposed SED Survey project at the Fox Lane Middle School. The following suspect materials were tested for PCB content:

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	PCB CONTENT (PPM)
No suspect caulking's/glazing's being affected by UV Replacement project			

5.0 AREAS NOT ACCESSIBLE

During the inspection the following areas were not accessible:

Spaces within Walls/Floors/Ceilings: No destructive sampling was performed on concealed spaces in walls to access plenum, chases etc. It should be assumed that asbestos containing materials may exist in these spaces. Any suspect materials encountered during work should be sampled for analysis before work continues.

Building Envelope: No destructive sampling was performed on the building envelope. It should be assumed that asbestos, lead and PCB containing materials may exist in these spaces. Any suspect materials encountered during work should be sampled for analysis before work continues.

6.0 CONCLUSIONS AND RECOMMENDATIONS

ACM, LBP and PCB were identified in this inspection that may be impacted as part of the proposed SED Survey project at the Fox Lane Middle School.

The ACM, LBP & PCB inspection was conducted at the request of Bedford Centra School District for the proposed SED Survey project at the Fox Lane Middle School. Any change in the scope of work will require further investigation to accurately classify any additional ACM, LBP or PCBs resulting from the modified or updated scope of work.

7.0 REPORT CERTIFICATIONS

This report, and the supporting data, findings, conclusions, opinions, and recommendations it contains represent the result of WSP's efforts for the environmental inspection work for the Fox Lane Middle School, SED Survey project.

Opinions and recommendations presented in this report apply to site conditions and features as they existed at the time of WSP's site visits, and those reasonably foreseeable. They cannot necessarily apply to conditions and features of which WSP is unaware and has not had the opportunity to evaluate.

The conclusions presented in this report are professional opinions solely upon WSP's visual observations of accessible areas, laboratory test data, and current regulatory requirements. These conclusions are intended exclusively for the purpose stated herein and the site indicated for the project indicated.

Prepared by:

Josue Garcia
NYS DOL Inspector

Reviewed by:

Steven Eget, PE
Vice President

APPENDIX A:
ASBESTOS SAMPLE ANALYSIS RESULTS IN TABULAR FORM

APPENDIX A
SAMPLE ANALYSIS RESULTS IN TABULAR FORM
FOX LANE MIDDLE SCHOOL
SED SURVEY PROJECT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
WSP Sampled on 08/25/2022					
A	01	Outdoor Play Area	Asphalt (Black)	NAD	NAD
	02	Outdoor Play Area		NAD	NAD
B	**03**	**Outdoor Play Area**	**Door Frame Tar (Black)**	**NAD**	**11% Anthophyllite 2.8% Chrysotile**
	04	**Outdoor Play Area**		**NAD**	**NA/PS**
C	05	Outdoor Play Area	Paint on Ceiling Wood Deck and Beams (White)	NAD	NAD
	06	Outdoor Play Area		NAD	NAD
D	07	Outdoor Play Area	Wall Paint (Red)	NAD	NAD
	08	Outdoor Play Area		NAD	NAD
E	09	Outdoor Play Area	Coat on Asphalt (White)	NAD	NAD
	10	Outdoor Play Area		NAD	NAD
F	11	Outdoor Play Area	Coat on Asphalt (Black)	NAD	NAD
	12	Outdoor Play Area		NAD	NAD
G	13	Outdoor Play Area	Tar at Crack Repair (Black)	NAD	NAD
	14	Outdoor Play Area		NAD	NAD
H	15	Outdoor Play Area	Exterior Brick Mortar (Red/Pink)	NAD	N/A
	16	Outdoor Play Area		NAD	N/A
I	17	2nd Floor, Lobby	Interior Brick Mortar (Dark Gray)	NAD	N/A
	18	2nd Floor, Stair by Lobby		NAD	N/A
J	19	3rd Floor, Room W212	Door Window Glazing (Dark Gray)	NAD	Trace Chrysotile
	20	3rd Floor, Hall by E202		NAD	Trace Chrysotile
K	21	2nd Floor, Lobby by Elevator	2'x4' Fissured Ceiling Tile (Beige/White)	NAD	NAD
	22	2nd Floor, Hall by S06		NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
L	23	3rd Floor, Hall by Room 303	2'x4' Fissured Ceiling Tile (Beige)	NAD	NAD
	24	3rd Floor, Hall by Room 202		NAD	NAD
M	25	1st Floor, Lobby	1'x1' Spline Ceiling Tile (Gray)	NAD	NAD
	26	Hall by C117		NAD	NAD
N	27	1st Floor, Toilet C117	Floor Ceramic Tile Mortar (Beige)	NAD	N/A
	28	2nd Floor, Room 210 slop Sink		NAD	N/A
O	29	2nd Floor, Lobby	Floor Ceramic Tile Mortar (Dark Gray)	NAD	N/A
	30	2nd Floor, Lobby		NAD	N/A
P	**31**	**2nd Floor, Lobby Elect. Room**	**Door Frame Tar (Black)**	**5% Chrysotile**	**NA/PS**
	32	**1st Floor, Stair to 2nd Floor**		**NA/PS**	**NA/PS**
Q	33	3rd Floor, Hall by Room 303	Gypsum (Gray)	NAD	N/A
	34	2nd Floor, Room E114		NAD	N/A
R	35	3rd Floor, Hall by Room 308	Joint Compound (White)	NAD	N/A
	36	2nd Floor, Room E114		NAD	N/A
S	37	2nd Floor, Hall by S129	Cinderblock Mortar (Gray)	NAD	N/A
	38	2nd Floor, Hall by 202		NAD	N/A
T	39	3rd Floor, Hall by Room 308	Ceramic Base Board Glue (Yellow)	NAD	NAD
	40	3rd Floor, Hall by Room 308		NAD	NAD
U	41	2nd Floor, Hall by C219	Ceramic Base Board Backing/Grout (Gray)	NAD	N/A
	42	2nd Floor, Hall by C219		NAD	N/A
V	43	Room 309, Slop Sink	Glazed Block Wall Mortar (Gray)	NAD	N/A
	44	1st Floor, Bath C117		NAD	N/A
W	45	2nd Floor, Teach Room	Cove Base (Gray)	NAD	NAD
	46	2nd Floor, S104		NAD	NAD
X	47	2nd Floor, Teach Room	Glue to Cove Base (Yellow)	NAD	NAD
	48	2nd Floor, S104		NAD	NAD
Y	49	2nd Floor, Room 209	16"x16" Floor Tile (Red)	NAD	NAD
	50	2nd Floor, Room 209		NAD	NAD
Z	51	2nd Floor, Room 209	Mastic 16"x16" Floor Tile (Black)	NAD	NAD
	52	2nd Floor, Room 209		NAD	NAD
A1	53	2nd Floor, Room 225 (Music Room)	12"x12" Floor Tile (Gray)	NAD	NAD
	54	2nd Floor, Room 303		NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
B1	55	2nd Floor, Room 225 (Music Room)	12”x12” Floor Tile (White)	NAD	NAD
	56	2nd Floor, Room 303		NAD	NAD
C1	57	2nd Floor, Room 225 (Music Room)	Mastic to 12”x12” Floor Tile (Black)	NAD	NAD
	58	2nd Floor, Room 303		NAD	NAD
D1	**59**	**Room 303**	**9”x9” Floor Tile (Gray)**	**NAD**	**9.5% Chrysotile**
	60	**Room 303**		**NAD**	**NA/PS**
E1	61	Room 303	Mastic to 9”x9” Floor Tile (Black)	NAD	NAD
	62	Room 303		NAD	NAD
F1	63	2nd Floor, S109	12”x12” Floor Tile (Gray)	NAD	NAD
	64	2nd Floor, S109		NAD	NAD
G1	65	2nd Floor, S109	Mastic to 12”x12” Gray Floor Tile (Black)	NAD	NAD
	66	2nd Floor, S109		NAD	NAD
H1	**67**	**1st Floor, Stair**	**12”x12” Floor Tile (Dark Gray)**	**1.4% Chrysotile**	**NA/PS**
	68	**1st Floor, Stair**		**NA/PS**	**NA/PS**
I1	69	1st Floor, Stair	Mastic to 12”x12” Floor Tile (Black)	NAD	NAD
	70	1st Floor, Stair		NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

APPENDIX B:
ASBESTOS BULK SAMPLE FIELD DATA SHEETS WITH CHAIN OF CUSODY & LABORATORY RESULTS

Atlas Environmental Lab, Corp.
255 West 36th Street, Suite# 1503
New York, NY 10018
Phone:(212) 563-0400 Fax:(212) 563-0401
www.atlasenvironmentallab.com

Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford School District / 31405320.012
Project Address: Fox Lane MS
Collected By: Client
Work Area: Throughout Interior / Exterior

AEL ID# BK0822418.REV
Date Received: 8/26/2022
PLM Date Analyzed: 8/27/2022
TEM Date Analyzed: 8/29/2022
Report Date: 8/29/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
A-1	BK0822418-1	Outdoor Play Area - Asphalt (Black)	Black, Homogeneous, Non-Fibrous	11.9	38.9	49.2	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
A-2	BK0822418-2	Outdoor Play Area - Asphalt (Black)	Black, Homogeneous, Non-Fibrous	10.3	49.9	39.8	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
B-3	BK0822418-3	Outdoor Play Area - Door Frame Tar (Black)	Black, Homogeneous, Non-Fibrous	40.8	56.0	3.2	0%	100%	**NAD** Inconclusive	**11%ANTH 2.8%CHRY Total = 13.8%**		**X**	**X**
B-4	BK0822418-4	Outdoor Play Area - Door Frame Tar (Black)	Black, Homogeneous, Non-Fibrous	43.2	54.9	1.9	0%	100%	**NAD** Inconclusive	**Not Analyzed**		**X**	
C-5	BK0822418-5	Outdoor Play Area - Paint on Ceiling Wood Deck and Beams (White)	White, Homogeneous, Non-Fibrous	38.2	47.6	14.2	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
C-6	BK0822418-6	Outdoor Play Area - Paint on Ceiling Wood Deck and Beams (White)	White, Homogeneous, Non-Fibrous	38.4	49.5	12.1	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
D-7	BK0822418-7	Outdoor Play Area - Wall Paint (Red)	Red, Homogeneous, Non-Fibrous	74.4	19.9	5.7	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
D-8	BK0822418-8	Outdoor Play Area - Wall Paint (Red)	Red, Homogeneous, Non-Fibrous	74.9	18.2	6.9	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
E-9	BK0822418-9	Outdoor Play Area - Coat on Asphalt (White)	Grey/Black, Homogeneous, Non-Fibrous	23.1	70.3	6.6	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
E-10	BK0822418-10	Outdoor Play Area - Coat on Asphalt (White)	Grey/Black, Homogeneous, Non-Fibrous	23.9	73.1	3.0	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**

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Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford School District / 31405320.012
Project Address: Fox Lane MS
Collected By: Client
Work Area: Throughout Interior / Exterior

AEL ID# BK0822418.REV
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PLM Date Analyzed: 8/27/2022
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							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
F-11	BK0822418-11	Outdoor Play Area - Coat on Asphalt (Black)	Black, Homogeneous, Non-Fibrous	23.8	58.7	17.6	0%	100%	**NAD** Inconclusive	**NAD**		X	X
F-12	BK0822418-12	Outdoor Play Area - Coat on Asphalt (Black)	Black, Homogeneous, Non-Fibrous	24.5	74.3	1.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
G-13	BK0822418-13	Outdoor Play Area - Tar at Crawl Repair (Black)	Black, Homogeneous, Non-Fibrous	23.7	73.4	2.9	0%	100%	**NAD** Inconclusive	**NAD**		X	X
G-14	BK0822418-14	Outdoor Play Area - Tar at Crawl Repair (Black)	Black, Homogeneous, Non-Fibrous	11.0	59.0	30.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
H-15	BK0822418-15	Outdoor Play Area - Ext Brick Mortar (Red/Pink)	Brown, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
H-16	BK0822418-16	Outdoor Play Area - Ext Brick Mortar (Red/Pink)	Brown, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
I-17	BK0822418-17	2nd FL Lobby - Int Brick Mortar (Dark Grey)	Black, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
I-18	BK0822418-18	2nd FL Lobby Stair by Lobby - Int Brick Mortar (Dark Grey)	Black, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
J-19	BK0822418-19	3rd FL Rm W212 - Door Window Glazing (Dark Grey)	Brown, Homogeneous, Non-Fibrous	28.1	12.2	59.6	0%	100%	**NAD** Inconclusive	**Trace CHRY**		X	X
J-20	BK0822418-20	3rd FL Hall by E202 - Door Window Glazing (Dark Grey)	Brown, Homogeneous, Non-Fibrous	20.4	10.9	68.7	0%	100%	**NAD** Inconclusive	**Trace CHRY**		X	X

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Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
K-21	BK0822418-21	2nd FL Lobby by Elev - 2'x4' Fissured Ceiling Tile (Beige/White)	White/Grey, Homogeneous, Non-Fibrous	17.7	79.5	2.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X
K-22	BK0822418-22	2nd FL Hall 5106 - 2'x4' Fissured Ceiling Tile (Beige/White)	White/Grey, Homogeneous, Non-Fibrous	16.2	80.9	2.9	0%	100%	**NAD** Inconclusive	**NAD**		X	X
L-23	BK0822418-23	3rd FL Hall by Rm 303 - 2'x2' Fissured Ceiling Tiles (Beige)	White/Grey, Homogeneous, Non-Fibrous	16.2	80.8	3.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
L-24	BK0822418-24	3rd FL Hall by Rm 202 - 2'x2' Fissured Ceiling Tiles (Beige)	White/Grey, Homogeneous, Non-Fibrous	16.0	78.9	5.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
M-25	BK0822418-25	1st FL Lobby - 1x1 Spline Ceiling Tile (Grey)	White/Grey, Homogeneous, Non-Fibrous	20.2	76.6	3.2	0%	100%	**NAD** Inconclusive	**NAD**		X	X
M-26	BK0822418-26	Hall by C117 - 1x1 Spline Ceiling Tile (Grey)	White/Grey, Homogeneous, Non-Fibrous	22.1	76.0	2.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
N-27	BK0822418-27	1st FL Toilet C117 - Floor Ceramic Tile Mortar (Beige)	Yellow, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
N-28	BK0822418-28	2nd FL Rm 210 Slop Sink - Floor Ceramic Tile Mortar (Beige)	Beige, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
O-29	BK0822418-29	2nd FL Lobby - Floor Ceramic Tile Mortar (Dark Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
O-30	BK0822418-30	2nd FL Lobby - Floor Ceramic Tile Mortar (Dark Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		

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							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
P-31	BK0822418-31	2nd FL Lobby Elect. Room - Door Frame Tar (Black)	Black, Homogeneous, Non-Fibrous	44.3	12.4	43.3	0%	95%	**5% CHRY**	**Not Analyzed**		X	
P-32	BK0822418-32	1st FL Stair to 2nd FL - Door Frame Tar (Black)	Black, Homogeneous, Non-Fibrous	50.5	20.0	29.5			**NA/PS**	**Not Analyzed**			
Q-33	BK0822418-33	3rd FL Hall by Rm 303 - Gypsum (Grey)	Grey, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	**NAD**		X		
Q-34	BK0822418-34	2nd FL Rm E114 - Gypsum (Grey)	Grey, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	**NAD**		X		
R-35	BK0822418-35	3rd FL by Rm 308 - Joint Compound (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
R-36	BK0822418-36	2nd FL E114 - Joint Compound (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
S-37	BK0822418-37	2nd FL Hall by S-129 - Cinder Block Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
S-38	BK0822418-38	2nd FL by Rm 202- Cinder Block Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
T-39	BK0822418-39	3rd FL Hall by Rm 308 - Ceramic Baseboard Glue (Yellow)	Yellow, Homogeneous, Non-Fibrous	82.3	13.2	4.5	0%	100%	**NAD** Inconclusive	**NAD**		X	X
T-40	BK0822418-40	3rd FL Hall by Rm 308 - Ceramic Baseboard Glue (Yellow)	Yellow, Homogeneous, Non-Fibrous	84.1	15.2	0.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X

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							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
U-41	BK0822418-41	2nd FL Hall by C-219 - Ceramic Baseboard Backing / Grout (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
U-42	BK0822418-42	2nd FL Hall by C-219 - Ceramic Baseboard Backing / Grout (Grey)	Beige, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
V-43	BK0822418-43	Rm 309 Slop Sink - Glazed block Wall Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
V-44	BK0822418-44	1st FL Bath C117 - Glazed block Wall Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
W-45	BK0822418-45	2nd FL Teach Room - Cove Base (Grey)	Grey, Homogeneous, Non-Fibrous	58.6	3.4	38.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
W-56	BK0822418-46	2nd FL S-104 - Cove Base (Grey)	Grey, Homogeneous, Non-Fibrous	57.2	3.6	39.2	0%	100%	**NAD** Inconclusive	**NAD**		X	X
X-47	BK0822418-47	2nd FL Teach Room - Glue to Cove Base (Yellow)	Yellow, Homogeneous, Non-Fibrous	61.4	23.7	14.9	0%	100%	**NAD** Inconclusive	**NAD**		X	X
X-48	BK0822418-48	2nd FL S-104 - Glue to Cove Base (Yellow)	Yellow, Homogeneous, Non-Fibrous	49.4	48.5	2.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
Y-49	BK0822418-49	2nd FL Room 209 - 16"x16" Floor Tile (Red)	Red, Homogeneous, Non-Fibrous	37.8	5.3	56.9	0%	100%	**NAD** Inconclusive	**NAD**		X	X
Y-50	BK0822418-50	2nd FL Room 209 - 16"x16" Floor Tile (Red)	Red, Homogeneous, Non-Fibrous	36.5	4.9	58.6	0%	100%	**NAD** Inconclusive	**NAD**		X	X

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							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
Z-51	BK0822418-51	2nd FL Room 209 - Mastic to 16"x16" Floor Tile (Black)	Black, Homogeneous, Non-Fibrous	45.8	17.5	36.7	0%	100%	**NAD** Inconclusive	**NAD**		X	X
Z-52	BK0822418-52	2nd FL Room 209 - Mastic to 16"x16" Floor Tile (Black)	Black, Homogeneous, Non-Fibrous	43.3	42.5	14.2	0%	100%	**NAD** Inconclusive	**NAD**		X	X
A1-53	BK0822418-53	2nd FL Rm 225 (Music Rm) - 12"x12" Floor Tile (Grey)	Grey, Homogeneous, Non-Fibrous	24.4	7.3	68.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X
A1-54	BK0822418-54	2nd FL Rm 303) - 12"x12" Floor Tile (Grey)	Grey, Homogeneous, Non-Fibrous	24.9	18.0	57.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
B1-55	BK0822418-55	2nd FL Rm 225 - 12"x12" Floor Tile (White)	Beige/Black, Homogeneous, Non-Fibrous	27.8	30.3	41.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X
B1-56	BK0822418-56	2nd FL Rm 303 - 12"x12" Floor Tile (White)	Beige/Black, Homogeneous, Non-Fibrous	23.5	13.2	63.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X
C1-57	BK0822418-57	2nd FL Rm 225 - Mastic to 12"x12" Floor Tile (Black)	Black, Homogeneous, Non-Fibrous	57.9	25.1	17.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
C1-58	BK0822418-58	2nd FL Rm 303 - Mastic to 12"x12" Floor Tile (Black)	Black, Homogeneous, Non-Fibrous	73.6	20.6	5.7	0%	100%	**NAD** Inconclusive	**NAD**		X	X
D1-59	BK0822418-59	Rm 303 - 9"x9" Floor Tile (Grey)	Grey, Homogeneous, Non-Fibrous	31.0	31.7	37.3	0%	100%	**NAD** Inconclusive	**9.5%CHRY**		X	X
D1-60	BK0822418-60	Rm 303 - 9"x9" Floor Tile (Grey)	Grey, Homogeneous, Non-Fibrous	36.3	29.3	34.3	0%	100%	**NAD** Inconclusive	**Not Analyzed**		X	

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E1-61	BK0822418-61	Rm 203 - Mastic to 9"x9" Floor Tile (Black)	Black, Homogeneous, Non-Fibrous	40.6	37.7	21.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X
E1-62	BK0822418-62	Rm 203 - Mastic to 9"x9" Floor Tile (Black)	Black, Homogeneous, Non-Fibrous	46.5	43.9	9.6	0%	100%	**NAD** Inconclusive	**NAD**		X	X
F1-63	BK0822418-63	2nd FL S-109 - 12"x12" Floor Tile (Grey)	Grey, Homogeneous, Non-Fibrous	20.6	16.3	63.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
F1-64	BK0822418-64	2nd FL S-109 - 12"x12" Floor Tile (Grey)	Grey, Homogeneous, Non-Fibrous	22.3	10.0	67.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X
G1-65	BK0822418-65	2nd FL S-109 - Mastic to 12"x12" Grey FT (Black)	Black, Homogeneous, Non-Fibrous	48.5	35.2	16.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X
G1-66	BK0822418-66	2nd FL S-109 - Mastic to 12"x12" Grey FT (Black)	Black, Homogeneous, Non-Fibrous	48.8	25.1	26.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
H1-67	BK0822418-67	1st FL Stair - 12"x12" Floor Tile (Dark Grey)	Grey/Black, Homogeneous, Non-Fibrous	36.8	20.0	43.2	0%	98.6%	**1.4% CHRY**	**Not Analyzed**		X	
H1-68	BK0822418-68	1st FL Stair - 12"x12" Floor Tile (Dark Grey)	Grey/Black, Homogeneous, Non-Fibrous	32.0	22.2	45.8			**NA/PS**	**Not Analyzed**			
I1-69	BK0822418-69	1st FL Stair - Mastic to 12"x12" Floor Tile (Black)	Black, Homogeneous, Non-Fibrous	25.6	44.1	30.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X

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I1-70	BK0822418-70	1st FL Stair - Mastic to 12"x12" Floor Tile (Black)	Black, Homogeneous, Non-Fibrous	37.5	13.8	48.7	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**

JR

Quantitative Analysis (Semi/Full):Bulk Asbestos Analysis-PLM by EPA 600/M4-82-020 per 40 CFR or ELAP198.1 (friable) and 198.6 (NOB) samples for New York.

NAD=no asbestos detected, NA/PS=Not Analyzed/Positive Stop, Trace=<1%,FBGL=Fiberglass, CELL=Cellulose,CHRY=Chrysotile,Amo=Amosite,CRO=Crocidolite,ANTH=Anthophylite, TRE=Tremolite, ACT=Actinolite, NA=not applicable.

PLM is not consistently reliable in detecting Asbestos in floor coverings and similar non friable organically bound materials. NAD or Trace results by PLM are inconclusive.

TEM is currently the only method that can be used to determine if this material can be considered or treated as non asbestos containing in NY State.

All samples were prepared and analyzed in accordance with the EPA "TEM Method for Identifying and Quantifying Asbestos in Non-Fibrous Organically Bound Bulk Samples" ELAP 198.4".

ORG%=Ashed Organic%, AII= Acid Insoluble Inorganic%, ASI= Acid Soluble Inorganic%

This "Summary of Analytical Results "shall not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, ELAP or any agency of the U.S Government. The results relate only to the items tested. This report may not be reproduced, except in full, without the written approval of AEL .Atlas Environmental lab did not collect the analyzed samples and thus accepts no liability with regard to their collection and/or maintenance . AEL relies on client's data. The liability of Atlas Environmental Lab corp with respect to the services charged, shall in no event exceed the amount of the invoice.

NYS-ELAP#11999, NVLAP Lab Code: 500092-0, NJ ID: NY034 "ELCP on NJ won't apply to TEM", CT ID:PH-0154

PLM Analyst: DK/RO TEM Analyst: VR Approved by:

B1L0822418

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.012
CLIENT: Bedford School District
PROJECT SITE: Fox Lane MS
Project Manager: A.Smolyar

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/25/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

WSP
TELEPHONE NO. : (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: Penn One, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐12 HR. ☐24 HR. ☐ 48 HR. ☑ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
A	1	Outdoor playarea	Asphalt (black)		
↓	2		↓		
B	3		Door frame TAR (black)		
↓	4		↓		
C	5		Paint on ceiling wood deck		
↓	6		and beams (white)		
D	7		Wall paint (red)		
↓	8		↓		
E	9		Coat on Asphalt (white)		
↓	10		↓		
F	11		Coat on Asphalt (black)		
↓	12	↓	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
H.Smolyar		8/26/22									
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
						8/26/22	12:40				

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

BK0822418

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.012
CLIENT: Bedford School District
PROJECT SITE: Fox Lane MS
Project Manager: A.Smolyar

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/25/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

WSP
TELEPHONE NO. : (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: Penn One, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐12 HR. ☐24 HR. ☐ 48 HR. ☑ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
G	13	Outdoor playarea	TAR AT CRACK REPAIR		
↓	14	↓	(black)		
H	15	Outdoor Play Area	Ext. Brick mortar		
↓	16	↓	(red/pink)		
I	17	2nd Fl Lobby	Int. Brick Mortar		
↓	18	↓ Stair by Lobby	(dark gray)		
J	19	3rd Fl Rm W212	Door Window Glazing		
↓	20	↓ Hall by E202	(dark gray)		
K	21	2nd Fl Lobby by Elev.	2'x4' Fissured Ceiling Tile		
↓	22	↓ Hall by S106	(beige/white)		
L	23	3rd Fl Hall by Rm 303	2'x2' Fissured Ceiling Tile		
↓	24	↓ ↓ 202	(beige)		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
A Smolyar		8/26/22									
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)	8/26/22	17:40 AM/PM	Received by: (print)	(Sign)		AM/PM

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

BK0822418

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.012
CLIENT: Bedford School District
PROJECT SITE: Fox Lane MS
Project Manager: A.Smolyar

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/25/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

WSP
TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: Penn One, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. ☑ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
M	25	1st FL lobby	1x1 Spline Ceiling Tile		
↓	26	Hall by C117	(gray)		
N	27	1st FL toilet C117	Floor ceramic tile		
↓	28	2nd FL Rm 210 Slop Sink	Mortar (beige)		
O	29	2nd FL lobby	Floor Ceramic tile		
↓	30	↓	mortar (dark gray)		
P	31	2nd FL lobby - Elec. Room	Door Frame TAR		
↓	32	1st FL Stair to 2nd FL	(black)		
Q	33	3rd FL Hall by Rm 303	Gypsum (gray)		
↓	34	2nd FL Rm E114	↓		
R	35	3rd FL by Rm 308	Joint Compound (white)		
↓	36	2nd FL E114	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
A. Smolyar		8/26/22									
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
						8/26/22	17:10				

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

BK0822418

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.012
CLIENT: Bedford School District
PROJECT SITE: Fox Lane MS
Project Manager: A.Smolyar

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/25/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

WSP
TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: Penn One, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. ☑ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
S	37	2nd Fl Hall by S129	Cinder Block Mortar		
↓	38	↓ by Rm 202	(gray)		
T	39	3rd Fl Hall by Rm 308	Ceramic Base Board		
↓	40	↓ ↓	~~grout~~ glue (yellow)		
U	41	2nd Fl Hall by C-219	Ceramic base board		
↓	42	↓ ↓	backing/grout (gray)		
V	43	Rm 309 Slop Sink	Glazed Block Wall		
↓	44	1st Fl Bath C117	Mortar (gray)		
W	45	2nd Fl Teach Room	Cove base (gray)		
↓	46	S104	↓		
X	47	Teacher Room	Glue to Cove base		
↓	48	S104	(yellow)		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
A. Smolyar		8/26/22									
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
						8/26/22	12:15 PM				

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

BLC822418

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.012
CLIENT: Bedford School District
PROJECT SITE: Fox Lane MS
Project Manager: A.Smolyar

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/25/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

WSP
TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: Penn One, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. ☑ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
Y	49	2nd Fl Rm 209	16" x 16" Floor tile		
↓	50		(red)		
Z	51		Mastic to 16" x 16" Floor		
↓	52		tile (black)		
A1	53	2nd Fl Rm 225 (Music Rm)	12" x 12" Floor tile (gray)		
↓	54	Rm 303	↓ ↓		
B1	55	225	(white)		
↓	56	303	↓ ↓		
C1	57	225	Mastic to 12" x 12" Floor		
↓	58	303	tile (black)		
D1	59	Rm 303	9" x 9" Floor Tile (gray)		
↓	60	↓	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
A. Smolyar		8/26/22				/ /				/ /	
Received by: (print)	(Sign)	/ /	AM/PM	Received by: (print)	(Sign)	8/26/22	17:11 AM/PM	Received by: (print)	(Sign)	/ /	AM/PM

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

BK0822418

WSP

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.012
CLIENT: Bedford School District
PROJECT SITE: Fox Lane MS
Project Manager: A.Smolyar

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/25/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

WSP
TELEPHONE NO. : (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: Penn One, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐12 HR. ☐24 HR. ☐48 HR. ☑72 HR.

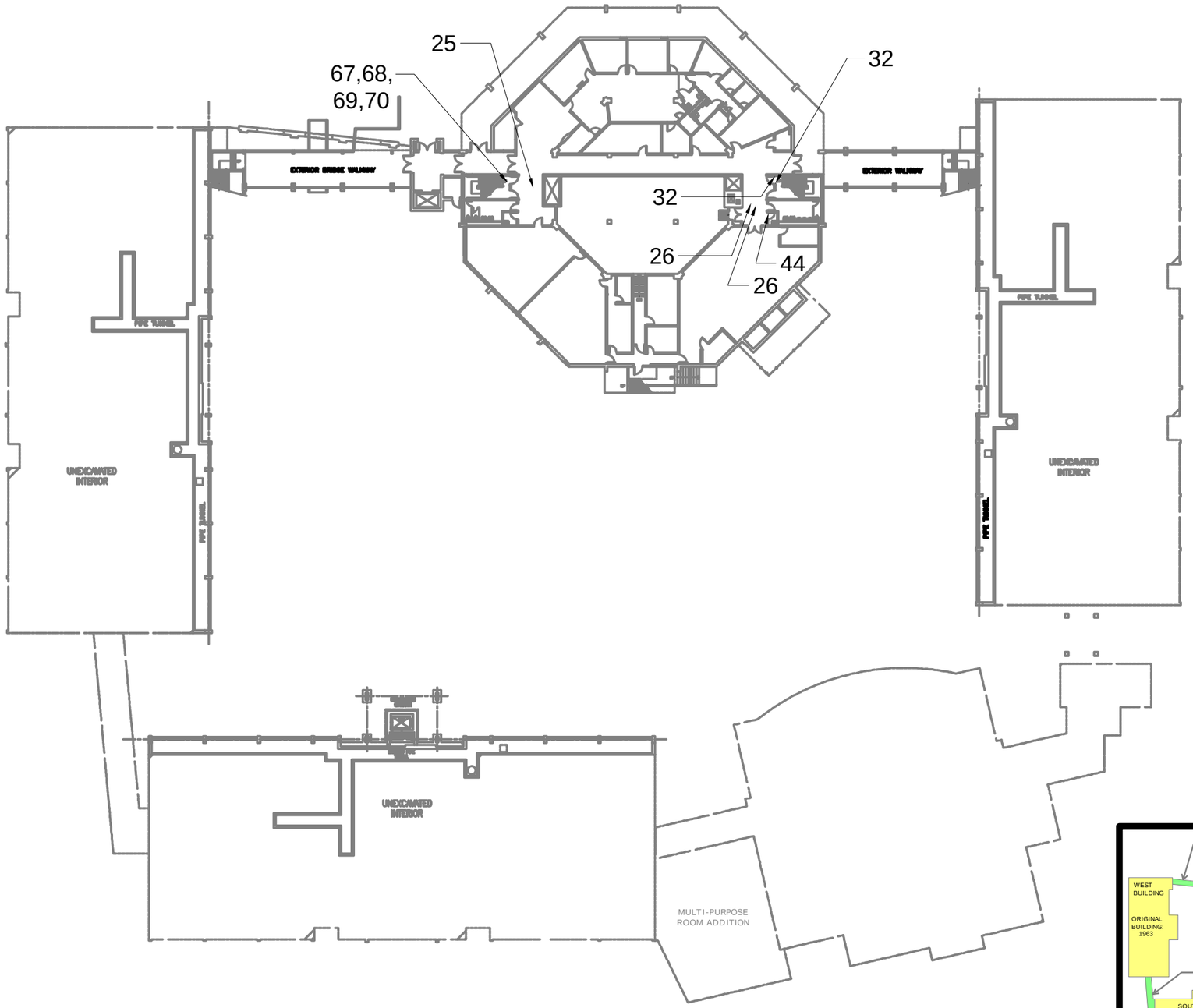
HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
E1	61	Rm 303	Mastic to 9"x9" Floor		
↓	62	↓	tile (black)		
F1	63	2nd FL S-109	12"x12" Floor tile		
↓	64	↓	(gray)		
G1	65	↓	Mastic to 12"x12" gray		
↓	66	↓	FT (black)		
H1	67	1st FL Stair	12"x12" Floor tile		
↓	68	↓	(dark gray)		
I1	69	↓	Mastic to 12"x12" Floor tile		
↓	70	↓	(black)		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
A. Smolyar		8/26/22									
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
						8/26/22	12:45 PM				

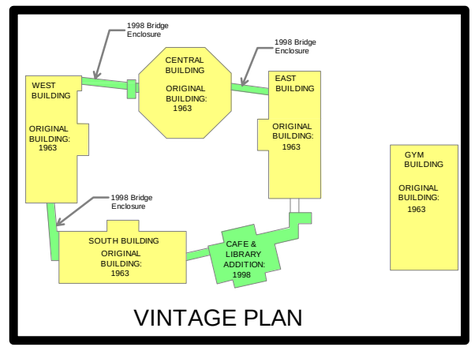
NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

APPENDIX C:
ASBESTOS BULK SAMPLE LOCATION DRAWINGS



FIRST FLOOR PLAN

SCALE: NOT TO SCALE



VINTAGE PLAN

BEDFORD CENTRAL SCHOOL DISTRICT

Every Single Student, Every Single Day

BEDFORD CENTRAL SCHOOL DISTRICT

FOX LANE CAMPUS
MOUNT KISCO, NY 10528

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive., Suite 450
Valhalla, NY 10595
TEL: 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

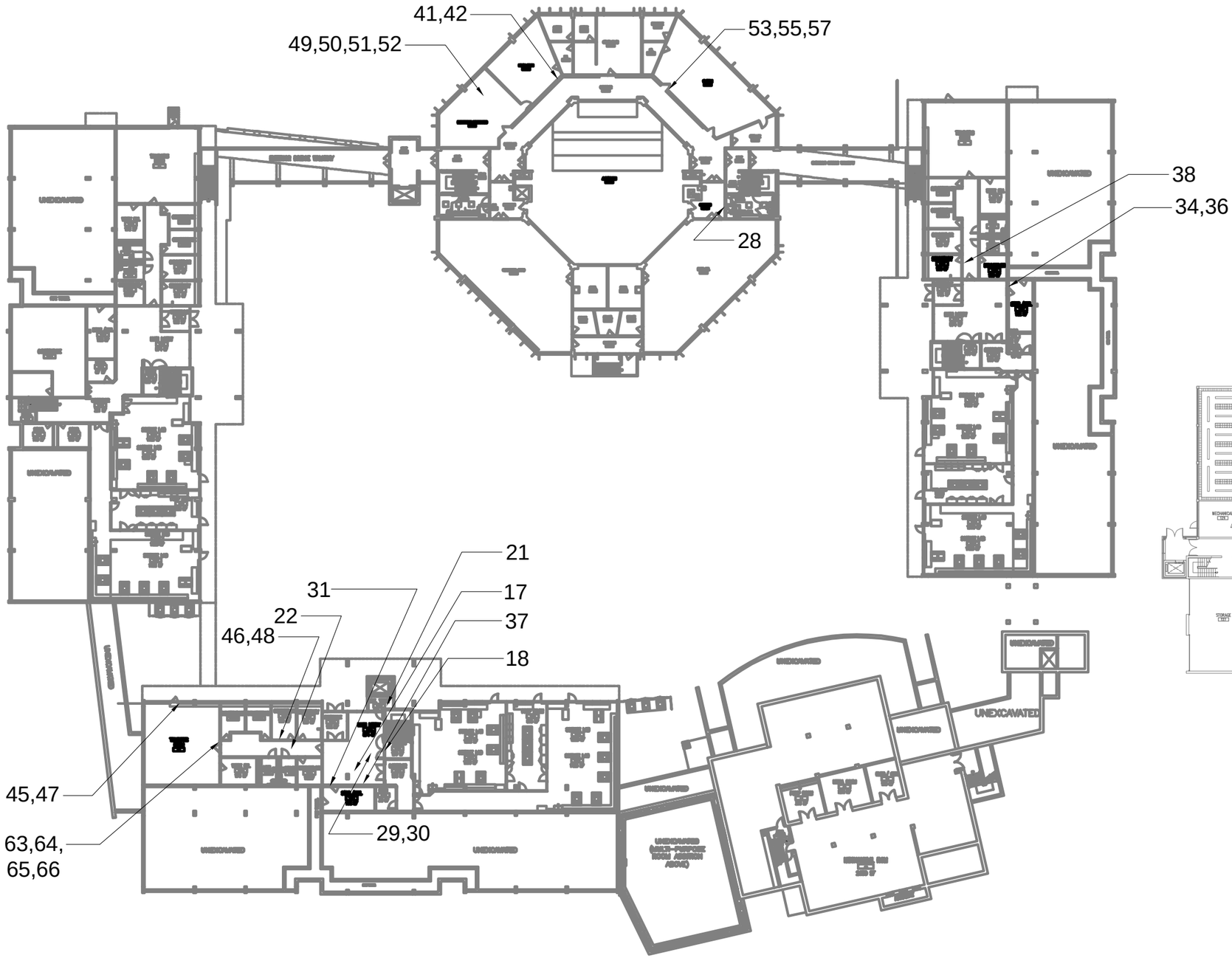
FOX LANE MIDDLE SCHOOL
SED SURVEY PROJECT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

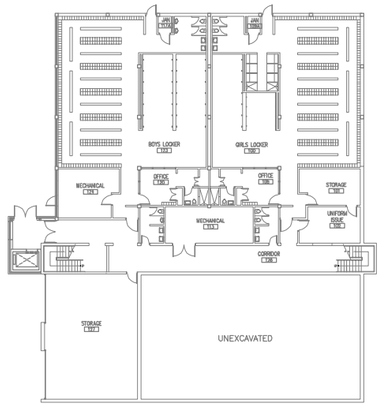
DRAWING TITLE

BULK SAMPLE LOCATIONS
FIRST FLOOR PLAN

DRAWN BY: J. PEREZ	SCALE: AS SHOWN
INSP./INV.: J. GARCIA	DATE: 09/23/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A. SMOLYAR	BSL001
	DRAWING NUMBER 1 OF 3

CONSULTANTS PROJECT 31405320.012





FIRST FLOOR PLAN

SCALE: NOT TO SCALE

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CENTRAL SCHOOL
DISTRICT

FOX LANE CAMPUS
MOUNT KISCO, NY 10528

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500 Summit Lake Drive, Suite 400
Valhalla, NY 10595
TEL: 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

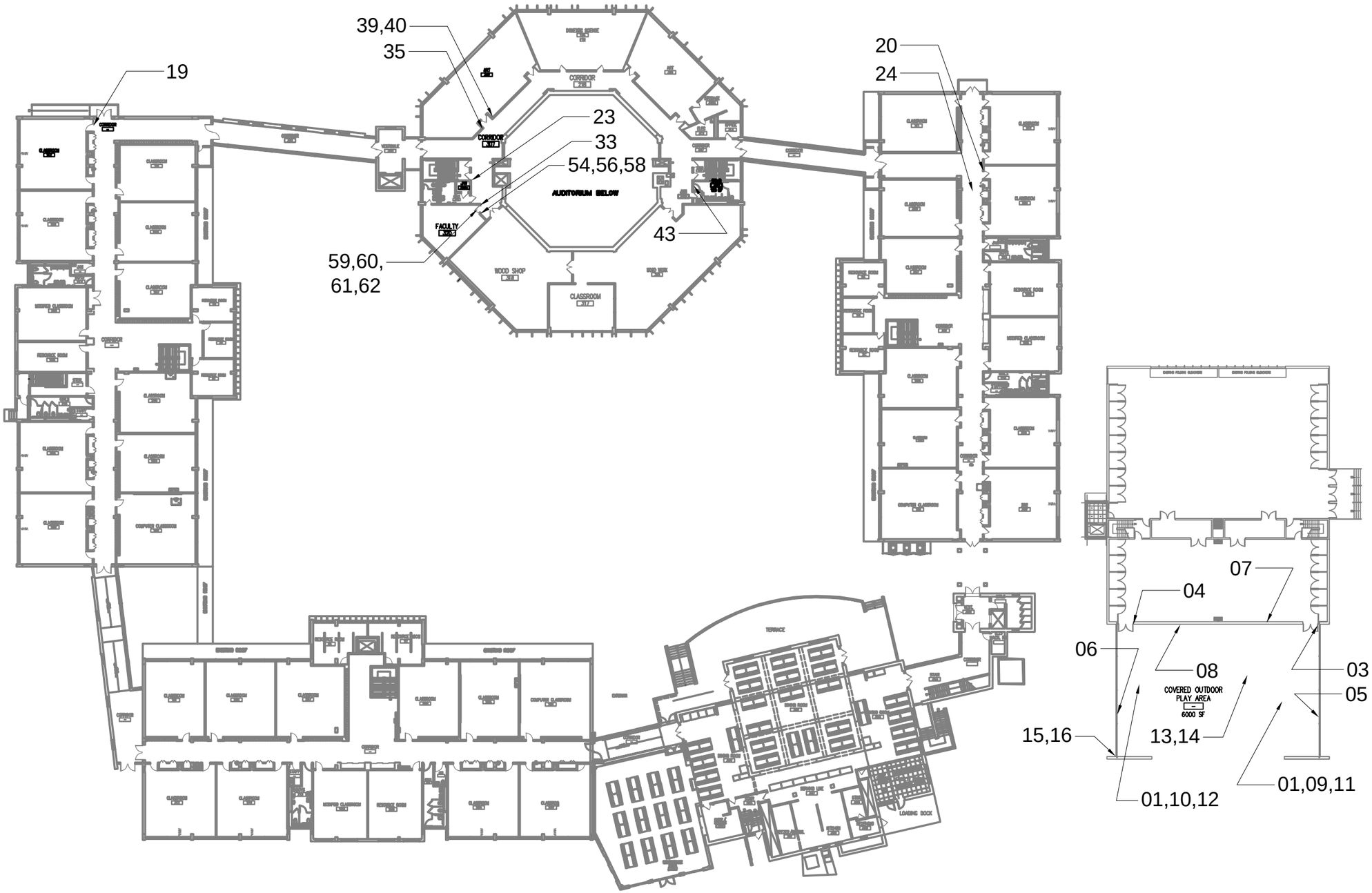
FOX LANE MIDDLE SCHOOL
SED SURVEY PROJECT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

DRAWING TITLE

BULK SAMPLE LOCATIONS
SECOND FLOOR PLAN

DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV. J.GARCIA	DATE: 09/23/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A.SMOLYAR	BSL002
	DRAWING NUMBER: 2 OF 3

CONSULTANTS PROJECT 31405320.012



THIRD FLOOR PLAN

SCALE: NOT TO SCALE

BEDFORD CENTRAL SCHOOL DISTRICT

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CENTRAL SCHOOL
DISTRICT

FOX LANE CAMPUS
MOUNT KISCO, NY 10528

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WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL: 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

FOX LANE MIDDLE SCHOOL
SED SURVEY PROJECT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

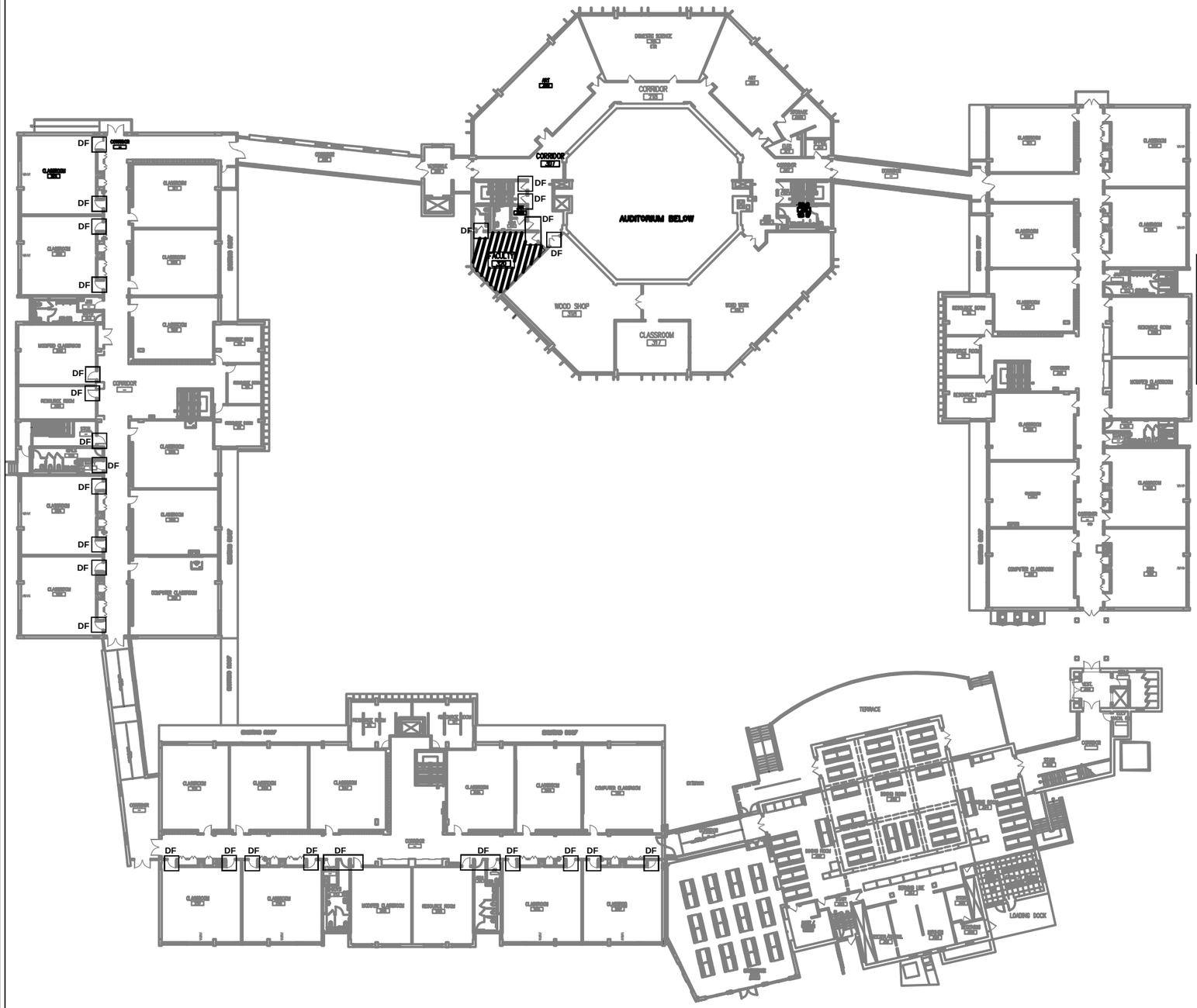
DRAWING TITLE

BULK SAMPLE LOCATIONS
THIRD FLOOR PLAN

DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV.: J.GARCIA	DATE: 09/23/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A.SMOLYAR	BSL003
	DRAWING NUMBER: 3 OF 3

CONSULTANTS PROJECT 31405320.012

APPENDIX D:
ASBESTOS CONTAINING MATERIALS LOCATION DRAWINGS



LEGEND

DF — LOCATION OF ASBESTOS CONTAINING DOOR FRAME TAR (BLACK).

LOCATION OF ASBESTOS CONTAINING DOOR FRAME TAR (BLACK) AND 12" X 12" FLOOR TILE (DARK GRAY).

THIRD FLOOR PLAN

SCALE: NOT TO SCALE

BEDFORD CENTRAL SCHOOL DISTRICT
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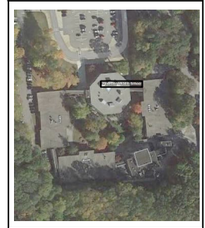
BEDFORD CENTRAL SCHOOL DISTRICT

FOX LANE CAMPUS
MOUNT KISCO, NY 10528

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL: 914.742.1120

KEY PLAN:



REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

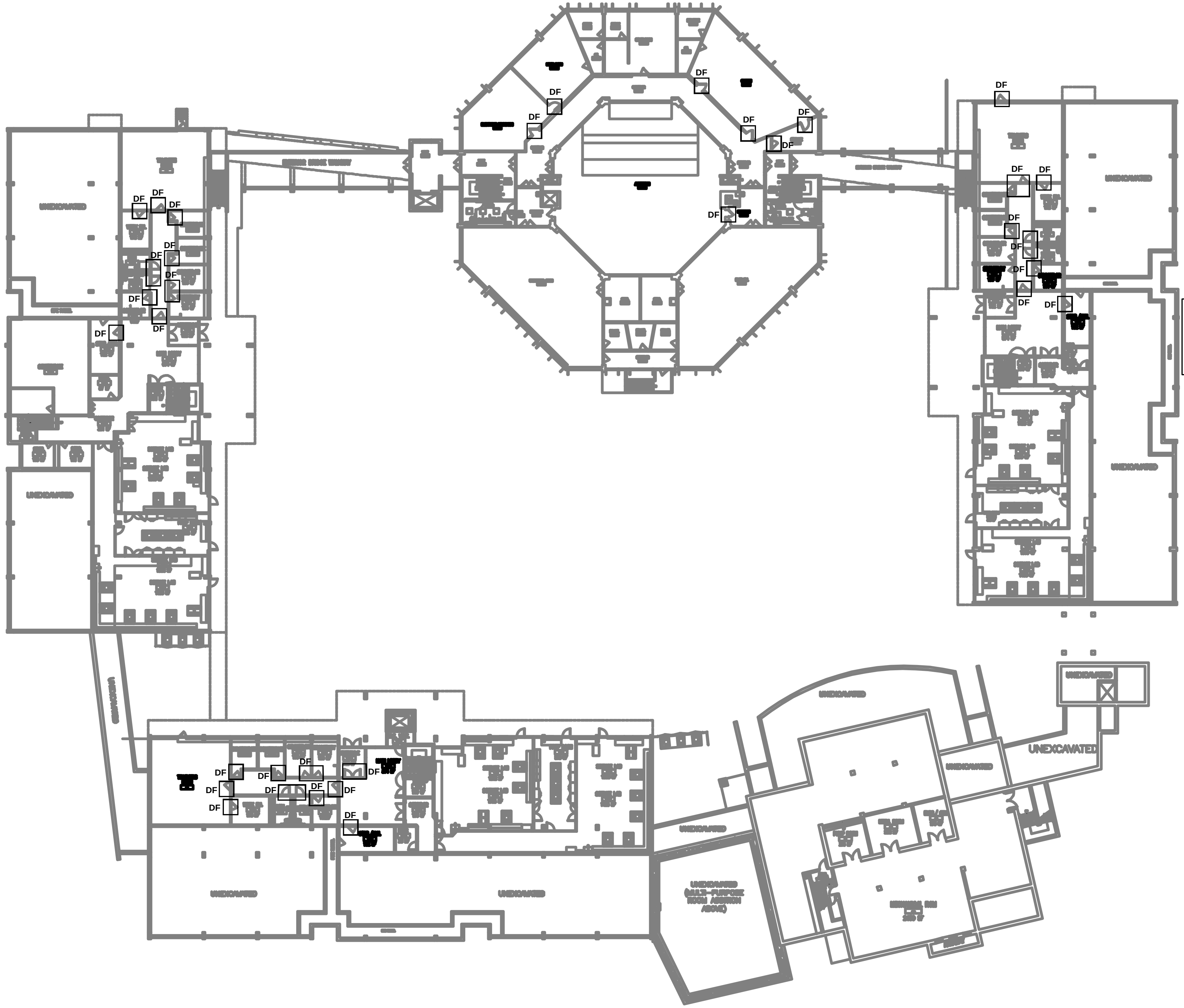
FOX LANE MIDDLE SCHOOL
SED SURVEY PROJECT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

DRAWING TITLE

ASBESTOS CONTAINING MATERIALS
THIRD FLOOR PLAN

DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV.: J.GARCIA	DATE: 09/23/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A.SMOLYAR	ACM003
	DRAWING NUMBER: 3 OF 3

CONSULTANTS PROJECT 31405320.012

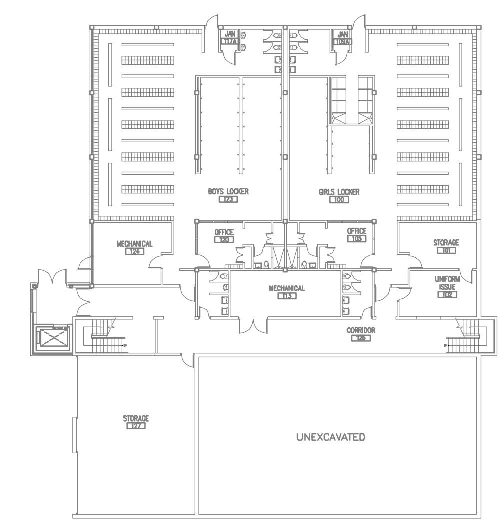


SECOND FLOOR PLAN

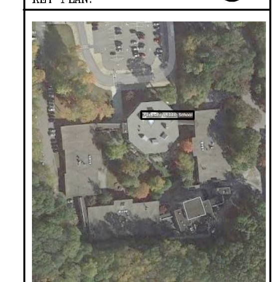
SCALE: NOT TO SCALE

LEGEND

DF — LOCATION OF ASBESTOS CONTAINING DOOR FRAME TAR (BLACK).



KEY PLAN:



BEDFORD CENTRAL SCHOOL DISTRICT
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FOX LANE CAMPUS
MOUNT KISCO, NY 10528

ENVIRONMENTAL CONSULTANT

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500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL. 914.742.1120

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

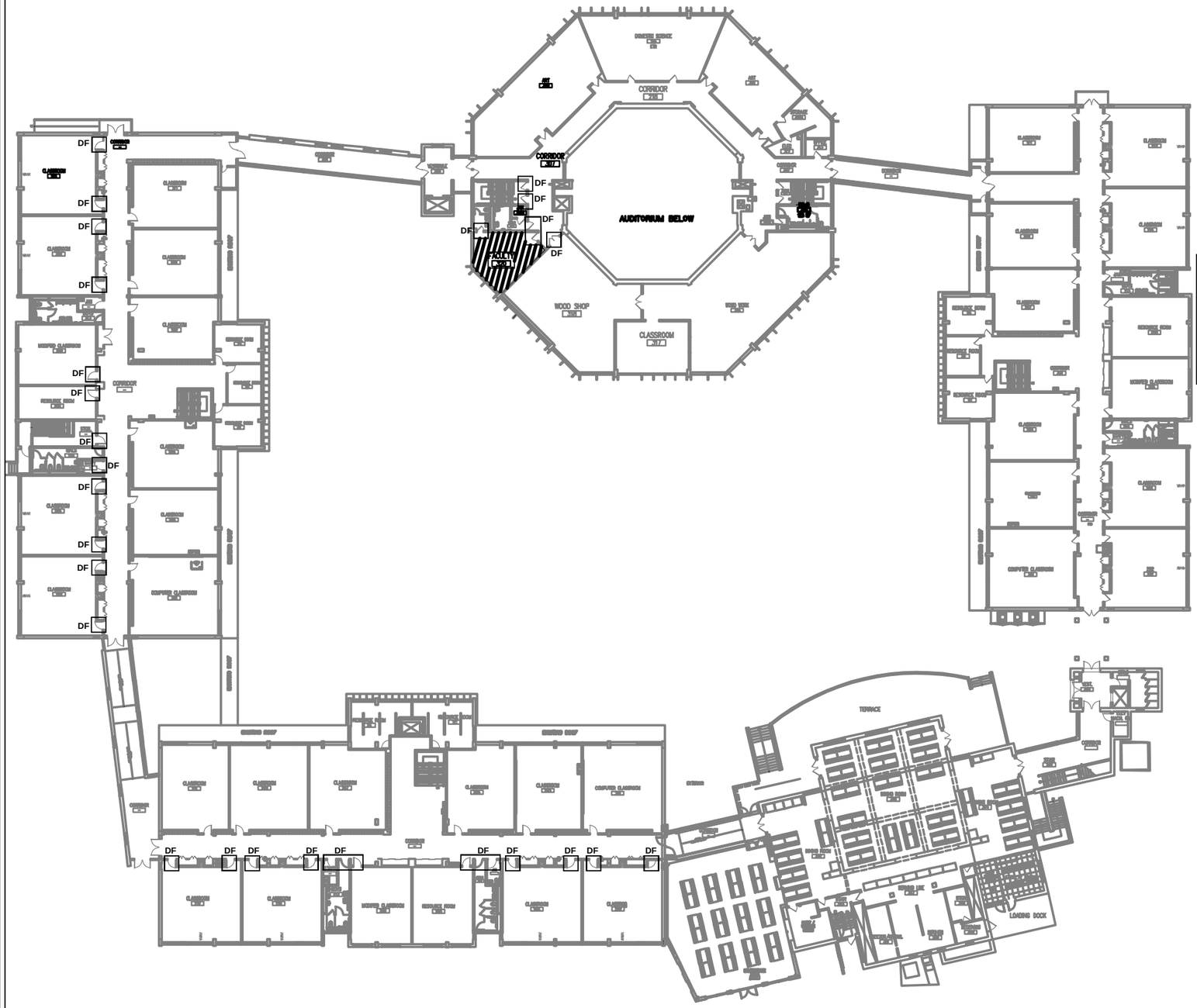
FOX LANE MIDDLE SCHOOL
SED SURVEY PROJECT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

DRAWING TITLE

ASBESTOS CONTAINING MATERIALS
SECOND FLOOR PLAN

DRAWN BY: J. PEREZ	SCALE: AS SHOWN
INSP./INV. J. GARCIA	DATE: 09/23/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A. SMOLYAR	ACM002
	DRAWING NUMBER: 2 OF 3

CONSULTANTS PROJECT 31405320.012



LEGEND

DF — LOCATION OF ASBESTOS CONTAINING DOOR FRAME TAR (BLACK).

LOCATION OF ASBESTOS CONTAINING DOOR FRAME TAR (BLACK) AND 12" X 12" FLOOR TILE (DARK GRAY).

THIRD FLOOR PLAN

SCALE: NOT TO SCALE

BEDFORD CENTRAL SCHOOL DISTRICT
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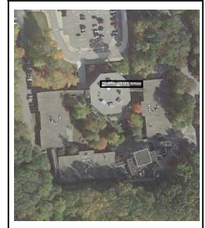
FOX LANE CAMPUS
MOUNT KISCO, NY 10528

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL: 914.742.1120

KEY PLAN:



REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

FOX LANE MIDDLE SCHOOL
SED SURVEY PROJECT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

DRAWING TITLE

ASBESTOS CONTAINING MATERIALS
THIRD FLOOR PLAN

DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV.: J.GARCIA	DATE: 09/23/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A.SMOLYAR	ACM003
	DRAWING NUMBER: 3 OF 3

CONSULTANTS PROJECT 31405320.012

APPENDIX E:
LEAD XRF SHOT RESULTS

XRF CALIBRATION CHECK FORM

PAGE 1 OF 1

PROJ. NO.:		DATE:	8/25/22
PROJECT NAME:	Fox Lane MS	INSPECTOR NAME:	A. Smolyar
CLIENT:	Bedford CSD	INSPECTOR SIGNATURE:	[signature]
SITE:		PROJ. MANAGER:	

LOUIS BERGER a WSP USA Company
TELEPHONE # : (212) 612-7900
FAX #: (212) 425-1618
ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014

XRF MAKE/MODEL: RMD LPA-1 (Serial#3675) / Heuresis Pb200i (Serial#2150) (circled) | LLW#: | JOB#:

NOTES:

CALIBRATION CHECK – PRIOR TO LEAVING OFFICE

1.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 830	TEST #	1	2	3	
	XRF READING	1.0	.8	1.1	

CALIBRATION CHECK – PRIOR TO LEAVING OFFICE

0.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 833	TEST #	4	5	6	
	XRF READING	0.0	0.1	0.1	

CALIBRATION CHECK – FIELD-START

1.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 1200	TEST #	53	54	55	
	XRF READING	1.1	0.9	1.0	

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

0.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 1202	TEST #	56	57	58	
	XRF READING	0.0	0.1	0.1	

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ____	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ____	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ____	TEST #				
	XRF READING				

XRF LEAD-BASED PAINT TESTING DATA SHEET/CHAIN OF CUSTODY

PAGE 1 OF ___

PROJECT NO.: ___
CLIENT: Bedford CSD
INSPECTOR(S): A. Sinolyar
PROJ. MANAGER: ___

PROJECT NAME: ___
PROJECT LOCATION: Fox Lane MS
INSPECTION DATE: 8/25/22

SPACE CHARACTERISTICS:
FLOOR #: ___ ROOM #: ___ ROOM NAME: ___

NOTES:

SAMPLE #	SUBSTRATE	COMPONENT DISCRIPTION: COLOR	CONDITION [I / F / P]	COMPONENT	WALL/SIDE DESIGN.	SIDE [L/C/R]	HEIGHT [L/M/U]	COMPONENT REPLICANT	QUANTITY (IF POSITIVE) [SF]	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	XRF READING [mg/cm²]
7	M PL S C (CB) PG CR / B W V CT G FG / OTHER:	Blue	G	WALL	A B C D / RM CTR / FL CL						3rd Floor	0.5
8	(M) PL S C CB PG CR / B W V CT G FG / OTHER:	gray	G	DF	A B C D / RM CTR / FL CL							0.0
9	M PL S C CB PG CR / B (W) V CT G FG / OTHER:	VARNISH		DOOR	A B C D / RM CTR / FL CL							0.1
10	(M) PL S C CB PG CR / B W V CT G FG / OTHER:	black		DF	A B C D / RM CTR / FL CL							0.5
11	M PL S C (CB) PG CR / B W V CT G FG / OTHER:	beige		BB	A B C D / RM CTR / FL CL							0.1
12	M PL S C (CB) PG CR / B W V CT G FG / OTHER:	white		CB	A B C D / RM CTR / FL CL							0.5
13	M PL S (C) CB PG CR / B W V CT G FG / OTHER:	white		Ceiling	A B C D / RM CTR / FL CL							0.1
14	M PL S C (CB) PG CR / B W V CT G FG / OTHER:	Black		BB	A B C D / RM CTR / FL CL							1.2
15	M PL S C (CB) PG CR / B W V CT G FG / OTHER:	mixed		WALL	A B C D / RM CTR / FL CL							0.4
16	M PL S C CB PG CR / B W V (CT) G FG / OTHER:	Beige		WALL	A B C D / RM CTR / FL CL							-0.1
17	M PL S C CB PG CR / B W V CT G FG / OTHER: grip	Blue		WALL	A B C D / RM CTR / FL CL							0.5
18	M PL S (C) CB PG CR / B W V CT G FG / OTHER:	white		Ceiling	A B C D / RM CTR / FL (CL)							0.1
19	M PL S C (CB) PG CR / B W V CT G FG / OTHER:	Yellow		WALL	A B C D / RM CTR / FL CL							-0.1
20	M PL S (C) CB PG CR / B W V (CT) G FG / OTHER:	tan		WALL	A B C D / RM CTR / FL CL							1.1
21	M PL S C CB PG CR / B W V CT G FG / OTHER: ceramic floor	white		WALL	A B C D / RM CTR / FL CL							1.0
22	(M) PL S C CB PG CR / B W V CT G FG / OTHER:	gray		DF	A B C D / RM CTR / FL CL							-0.1
23	M PL S C CB PG CR / B (W) V CT G FG / OTHER:	VARNISH		DOOR	A B C D / RM CTR / FL CL							0.1
24	M PL S C (CB) PG CR / B W V CT G FG / OTHER:	red		WALL	A B C D / RM CTR / FL CL							0.2
25	M PL S C CB PG CR / B (W) V CT G FG / OTHER:	VARNISH		BB	A B C D / RM CTR / FL CL							-0.2
26	M PL S C CB PG CR / B W V (CT) G FG / OTHER:	white		BB	A B C D / RM CTR / FL CL							1.3

Side: Left/Center/Right; Height: Lower/Middle/Upper; Substrate: M: Metal; PL: Plaster; S: Sheetrock; C: Concrete; CB: Cinder Block; CR: Sinks, Water Closets, etc.; CT: Ceramic Tile; PG: Porcelain-glazed Block; B: Brick; W: Wood; V: Vinyl; FG: Fiberglass; G: Glass ; Condition: I = Intact; F = Fair; P = Poor; Initial Result: P = Positive; N = Negative;

50	(M)	BLACK	FENCE	-0.1
51	Asphalt	White	FLOOR	0.1
52	1	BLACK	1	0.2

XRF LEAD-BASED PAINT TESTING DATA SHEET/CHAIN OF CUSTODY

PROJECT NO.: ___
CLIENT: Bedford CSD
INSPECTOR(S): A. SMOLYAR
PROJ. MANAGER: ___

PROJECT NAME: ___
PROJECT LOCATION: FOX LANE MS
INSPECTION DATE: 8/25/22

SPACE CHARACTERISTICS:
FLOOR #: ___ ROOM #: ___ ROOM NAME: ___

NOTES:

SAMPLE #	SUBSTRATE	COMPONENT DISCRIPTION: COLOR	CONDITION [I / F / P]	COMPONENT	WALL/SIDE DESIGN.	SIDE [L/C/R]	HEIGHT [L/M/U]	COMPONENT REPLICANT	QUANTITY (IF POSITIVE) [SF]	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	XRF READING [mg/cm²]
27	M PL S C CB PG CR B W V CT G FG OTHER: gyp	Blue		WALL	A B C D RM CTR FL CL						3RD FL	0.1
28	M PL S C CB PG CR B (W) V CT G FG OTHER:	VARNISH		FLOOR	A B C D RM CTR FL CL						↓	-0.1
29	M PL S C CB PG CR B W V CT G FG OTHER: glazing block	Brown		Floor	A B C D RM CTR FL CL						2ND FL	0.2
30	M PL S C CB PG CR B W (V) CT G FG OTHER:	gray		BB	A B C D RM CTR FL CL						↓	0.5
31	M PL S C (CB) PG CR B W V CT G FG OTHER:	white		WALL	A B C D RM CTR FL CL						↓	0.1
32	(M) PL S C CB PG CR B W V CT G FG OTHER:	gray		DF	A B C D RM CTR FL CL						↓	0.4
33	M PL S C CB PG CR B (W) V CT G FG OTHER:	VARNISH		DOOR	A B C D RM CTR FL CL						↓	0.0
34	M PL S C (CB) PG CR B W V CT G FG OTHER:	white		WALL	A B C D RM CTR FL CL						↓	0.1
35	M PL S C CB PG CR B W V CT G FG OTHER: gyp	white		WALL	A B C D RM CTR FL CL						↓	0.0
36	M PL S C (CB) PG CR B W V CT G FG OTHER:	white		WALL	A B C D RM CTR FL CL						1ST FL	0.1
37	(M) PL S C CB PG CR B W V CT G FG OTHER:	BLACK		DF	A B C D RM CTR FL CL						↓	-0.1
38	M PL S C CB PG CR B (W) V CT G FG OTHER:	VARNISH		Door	A B C D RM CTR FL CL						↓	0.0
39	M PL S (C) CB PG CR B W V CT G FG OTHER:	red		WALL	A B C D RM CTR FL CL						↓	0.2
40	M PL S (C) CB PG CR B W V CT G FG OTHER:	white		Ceiling	A B C D RM CTR FL CL						↓	0.1
41	(M) PL S C CB PG CR B W V CT G FG OTHER:	white		BEAM	A B C D RM CTR (FL) CL						↓	2.1
42	M PL S C CB PG CR B (W) V CT G FG OTHER:	white		WOOD DECK	A B C D RM CTR (FL) CL						↓	0.1
43	M PL S C CB PG CR B (W) V CT G FG OTHER:	white		↓	A B C D RM CTR (FL) CL						↓	0.0
44	(M) PL S C CB PG CR B W V CT G FG OTHER:	~~white~~ rusty		METAL Column	A B C D RM CTR FL CL						↓	2.8
45	M PL S C CB PG CR B (W) V CT G FG OTHER:	red		WALL	A B C D RM CTR FL CL						↓	0.1
46	M PL S C CB PG CR B (W) V CT G FG OTHER:	BLACK		WALL	A B C D RM CTR FL CL						↓	0.1

Side: Left/Center/Right; Height: Lower/Middle/Upper; Substrate: M: Metal; PL: Plaster; S: Sheetrock; C: Concrete; CB: Cinder Block; CR: Sinks, Water Closets, etc.; CT: Ceramic Tile; PG: Porcelain-glazed Block; B: Brick; W: Wood; V: Vinyl; FG: Fiberglass; G: Glass ; Condition: I = Intact; F = Fair; P = Poor; Initial Result: P = Positive; N = Negative;

47	(M)	white	DECK		0.1
48	(M)	RED	DOOR		-0.1
	M	BLACK	DF		0.0

APPENDIX F:
PCB BULK SAMPLE FIELD DATA SHEETS WITH CHAIN OF CUSTODY & LABORATORY RESULTS

Technical Report

prepared for:

WSP USA (New York, NY)
One Penn Plaza, 2nd Floor
New York NY, 10119
Attention: Alexander Smolyar

Report Date: 09/06/2022
Client Project ID: 31405320.012 Fox Lane H.S
York Project (SDG) No.: 22H1647

Report Date: 09/06/2022
Client Project ID: 31405320.012 Fox Lane H.S
York Project (SDG) No.: 22H1647

WSP USA (New York, NY)
One Penn Plaza, 2nd Floor
New York NY, 10119
Attention: Alexander Smolyar

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on August 29, 2022 and listed below. The project was identified as your project: **31405320.012 Fox Lane H.S**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Sample and Analysis Qualifiers section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the Sample and Data Qualifiers Relating to This Work Order section of this report and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
22H1647-01	A-1/2/3	Caulk	08/24/2022	08/29/2022
22H1647-02	B-4/5/6	Caulk	08/24/2022	08/29/2022
22H1647-03	C-7/8/9	Caulk	08/24/2022	08/29/2022
22H1647-04	D-10/11/12	Caulk	08/24/2022	08/29/2022
22H1647-05	E-13/14/15	Caulk	08/24/2022	08/29/2022
22H1647-06	F-16/17/18	Caulk	08/24/2022	08/29/2022

General Notes for York Project (SDG) No.: 22H1647

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All analyses conducted met method or Laboratory SOP requirements. See the Sample and Data Qualifiers Section for further information.
6. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
7. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.
8. Analyses conducted at York Analytical Laboratories, Inc. Stratford, CT are indicated by NY Cert. No. 10854; those conducted at York Analytical Laboratories, Inc., Richmond Hill, NY are indicated by NY Cert. No. 12058.

Approved By: 

Date: 09/06/2022

Cassie L. Mosher
Laboratory Manager

Sample Information

Client Sample ID: A-1/2/3 **York Sample ID:** 22H1647-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB) **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:42	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:42	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:42	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:42	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:42	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:42	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:42	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,NJDEP	09/05/2022 17:42	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,NJDEP	09/05/2022 17:42	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 17:42	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*97.0 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*104 %*	*30-140*

Sample Information

Client Sample ID: B-4/5/6 **York Sample ID:** 22H1647-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB) **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:55	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:55	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 17:55	BJ

Sample Information

Client Sample ID: B-4/5/6 **York Sample ID:** 22H1647-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
53469-21-9	Aroclor 1242	ND		mg/kg	0.403	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 17:55	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.403	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 17:55	BJ
11097-69-1	**Aroclor 1254**	**0.495**		mg/kg	0.403	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 17:55	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.403	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 17:55	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.403	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 17:55	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.403	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 17:55	BJ
1336-36-3	*** Total PCBs**	**0.495**		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 17:55	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*102 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*112 %*	*30-140*

Sample Information

Client Sample ID: C-7/8/9 **York Sample ID:** 22H1647-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
11097-69-1	**Aroclor 1254**	**0.490**		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ

Sample Information

Client Sample ID: C-7/8/9 **York Sample ID:** 22H1647-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
37324-23-5	Aroclor 1262	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.327	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:09	BJ
1336-36-3	*** Total PCBs**	**0.490**		mg/kg	0.327	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 18:09	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*98.0 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*118 %*	*30-140*

Sample Information

Client Sample ID: D-10/11/12 **York Sample ID:** 22H1647-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.350	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:22	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.350	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 18:22	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*90.5 %*	*30-140*

Sample Information

Client Sample ID: D-10/11/12 **York Sample ID:** 22H1647-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
2051-24-3	*Surrogate: Decachlorobiphenyl*	*98.0 %*			*30-140*					

Sample Information

Client Sample ID: E-13/14/15 **York Sample ID:** 22H1647-05

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.273	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:36	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.273	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 18:36	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*99.0 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*112 %*	*30-140*

Sample Information

Client Sample ID: F-16/17/18 **York Sample ID:** 22H1647-06

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1647	31405320.012 Fox Lane H.S	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 18:49	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.413	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 18:49	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*51.0 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*69.0 %*	*30-140*

Analytical Batch Summary

Batch ID: BI20099 **Preparation Method:** EPA 3550C **Prepared By:** KEO

YORK Sample ID	Client Sample ID	Preparation Date
22H1647-01	A-1/2/3	09/02/22
22H1647-02	B-4/5/6	09/02/22
22H1647-03	C-7/8/9	09/02/22
22H1647-04	D-10/11/12	09/02/22
22H1647-05	E-13/14/15	09/02/22
22H1647-06	F-16/17/18	09/02/22
BI20099-BLK1	Blank	09/02/22
BI20099-BS1	LCS	09/02/22
BI20099-BSD1	LCS Dup	09/02/22

Polychlorinated Biphenyls by GC/ECD - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BI20099 - EPA 3550C											
Blank (BI20099-BLK1)								Prepared: 09/02/2022 Analyzed: 09/05/2022			
Aroclor 1016	ND	0.455	mg/kg								
Aroclor 1221	ND	0.455	"								
Aroclor 1232	ND	0.455	"								
Aroclor 1242	ND	0.455	"								
Aroclor 1248	ND	0.455	"								
Aroclor 1254	ND	0.455	"								
Aroclor 1260	ND	0.455	"								
Aroclor 1262	ND	0.455	"								
Aroclor 1268	ND	0.455	"								
Total PCBs	ND	0.455	"								
Surrogate: Tetrachloro-m-xylene	*1.65*		*"*	*1.82*		*90.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*1.69*		*"*	*1.82*		*93.0*	*30-140*				
LCS (BI20099-BS1)								Prepared: 09/02/2022 Analyzed: 09/05/2022			
Aroclor 1016	7.97	0.455	mg/kg	9.09		87.6	40-130				
Aroclor 1260	8.40	0.455	"	9.09		92.4	40-130				
Surrogate: Tetrachloro-m-xylene	*1.75*		*"*	*1.82*		*96.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*1.93*		*"*	*1.82*		*106*	*30-140*				
LCS Dup (BI20099-BSD1)								Prepared: 09/02/2022 Analyzed: 09/05/2022			
Aroclor 1016	7.12	0.455	mg/kg	9.09		78.3	40-130		11.2	25	
Aroclor 1260	7.37	0.455	"	9.09		81.1	40-130		13.1	25	
Surrogate: Tetrachloro-m-xylene	*1.54*		*"*	*1.82*		*84.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*1.58*		*"*	*1.82*		*87.0*	*30-140*				
Batch Y2I0605 - BI20097											
Aroclor Reference (Y2I0605-ARC1)								Prepared & Analyzed: 09/05/2022			
Surrogate: Tetrachloro-m-xylene	*0.211*		*ug/mL*	*0.200*		*106*					
Surrogate: Decachlorobiphenyl	*0.210*		*"*	*0.200*		*105*					

Sample and Data Qualifiers Relating to This Work Order

Definitions and Other Explanations

*	Analyte is not certified or the state of the samples origination does not offer certification for the Analyte.
ND	NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
LOQ	LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence. This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon NELAC 2009 Standards and applies to all analyses.
LOD	LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.
MDL	METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.
Reported to	This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two. For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the LOD/MDL, with values between the LOD/MDL and the LOQ being "J" flagged as estimated results.

For analyses by EPA SW-846-8270D, the Limit of Quantitation (LOQ) reported for benzidine is based upon the lowest standard used for calibration and is not a verified LOQ due to this compound's propensity for oxidative losses during extraction/concentration procedures and non-reproducible chromatographic performance.

22 of 1647

PCB SURVEY DATA SHEET/ CHAIN OF CUSTODY

WSP PROJ #: 31405320.012
CLIENT: Bedford School District
Project Site: Fox Lane H.S.
Project Manager: A. Smolyar

LOCATION(S) SURVEYED Int / Ext.
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/24/22
Inspector(s) J Garcia, D Klimossenko, A. Smolyar

WSP
TELEPHONE NO. : (212) 612-7900 **FAX NO.: (212) 363-4341**
ADDRESS: 96 Morton Street, 8 Floor, New York, NY 10014

RESULTS TO: Alexander.smolyar@wsp.

TURNAROUND TIME:
☐48 HR ☐72 H R ☐96 HR ☑120 HR

LAB SAMPLE NO.	HA	SAMPLE NO.	MATERIAL DESCRIPTION	SAMPLE LOCATION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
	A	1	Ext. floor expansion joint caulking	Corridor 1F		
	↓	2	sidewalk / saddle (gray)	↓		
	↓	3	↓	↓		
	B	4	Interior door frame	Rm 21E		
	↓	5	caulking (gray)	↓		
	↓	6	↓	↓		
	C	7	Interior Door frame	Fitness Room		
	↓	8	caulking (white)	Fitness Room		
	↓	9	↓	↓		
	d	10	Exterior Door frame	Room 21E		
	↓	11	caulking (gray)	↓		
	↓	12	↓	↓		

CHAIN OF CUSTODY

Relinquished by (print)	(Sign)		AM/PM	Relinquished by (print)	(Sign)		AM/PM	Relinquished by (print)	(Sign)		AM/PM
A. Smolyar		8/26/22				8/29/22	1531	I. B		8/29/22	1845
Received by (print)	(Sign)		AM/PM	Received by (print)	(Sign)		AM/PM	Received by (print)	(Sign)		AM/PM
		8/29/22	25	I. B		/ /				8/29/22	1845

LAB INSTRUCTIONS: create one (1) composite sample of each homogeneous material from equal mass portions (± 5%) of the three (3) sub-samples for extraction and analysis via EPA Method 8082 and report the Arochlors listed (Arochlor 1016, Arochlor 1221, Arochlor 1232, Arochlor 1242, Arochlor 1248, Arochlor 1254, Arochlor 1260). The laboratory shall target a PCB detection limit of 1 ppm

22H1647

PCB SURVEY DATA SHEET/ CHAIN OF CUSTODY

WSP PROJ #: 31405320.012
CLIENT: Bedford CSD
Project Site: Fox Lane HS
Project Manager: A. Smolyar

LOCATION(S) SURVEYED Int & Ext
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/24/22
Inspector(s) J. Garcia, D. Rinnosseanu, A. Smolyar

WSP
TELEPHONE N0. : (212) 612-7900 **FAX N0.: (212) 363-4341**
ADDRESS: 96 Morton Street, 8 Floor, New York, NY 10014

RESULTS TO:

TURNAROUND TIME:
☐48 HR ☐72 H R ☐96 HR ☑120 HR

LAB SAMPLE NO.	HA	SAMPLE NO.	MATERIAL DESCRIPTION	SAMPLE LOCATION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
	e	13	Exterior Door frame Caulking	Outside Rm A101		
	↓	14	Cmu	Corr. 1D Exit A		
	↓	15	↓	↓		
	f	16	Ext Door Silicone	Corr. 1J		
	↓	17	(white/clear)	↓		
	↓	18	↓	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
A. Smolyar		8/26/22					
		8/29/22		I. B		8/29/22 1531	
I. B		8/29/22				8/29/22 1545	

LAB INSTRUCTIONS: create one (1) composite sample of each homogeneous material from equal mass portions (± 5%) of the three (3) sub-samples for extraction and analysis via EPA Method 8082 and report the Arochlors listed (Arochlor 1016, Arochlor 1221, Arochlor 1232, Arochlor 1242, Arochlor 1248, Arochlor 1254, Arochlor 1260). The laboratory shall target a PCB detection limit of 1 ppm

APPENDIX G:
COMPANY LICENSE, PERSONAL CERTIFICATIONS AND LABORATORY ACCREDITATIONS

New York State – Department of Labor
Division of Safety and Health
License and Certificate Unit
State Campus, Building 12
Albany, NY 12240

ASBESTOS HANDLING LICENSE

WSP USA Solutions Inc.
4th Floor
One Penn Plaza

New York, NY 10119

FILE NUMBER: 19-132876
LICENSE NUMBER: 132876
LICENSE CLASS: RESTRICTED
DATE OF ISSUE: 03/31/2022
EXPIRATION DATE: 03/31/2023

Duly Authorized Representative – Craig Napolitano:

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Amy Phillips, Director
For the Commissioner of Labor

SH 432 (8/12)

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2023
Issued April 01, 2022

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MS. JACKIE DARVISH
ATLAS ENVIRONMENTAL LABS CORP
255 W 36TH STREET SUITE 1503
NEW YORK, NY 10018

NY Lab Id No: 11999

is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:

Miscellaneous

Asbestos in Friable Material	Item 198.1 of Manual
	EPA 600/M4/82/020
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)
Asbestos in Non-Friable Material-TEM	Item 198.4 of Manual
Asbestos-Vermiculite-Containing Material	Item 198.8 of Manual
Lead in Dust Wipes	EPA 7000B
Lead in Paint	EPA 7000B

Sample Preparation Methods

EPA 3050B

Serial No.: 64911

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Atlas Environmental Lab (Asbestos in Bulk)
255 W 36th Street Suite #1503
New York, NY 10018
Ms. Jackie Darvish
Phone: 212-563-0400 Fax: 212-563-0401
Email: jdarvish@atlasenvironmentallab.com
http://www.atlasenvironmentallab.com

ASBESTOS FIBER ANALYSIS — NVLAP LAB CODE 500092-0

Bulk Asbestos Analysis

Code	*Description*
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

Code	*Description*
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

For the National Voluntary Laboratory Accreditation Program

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 500092-0

Atlas Environmental Lab (Asbestos in Bulk)

New York, NY

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2021-10-01 through 2022-09-30

Effective Dates

For the National Voluntary Laboratory Accreditation Program

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

Atlas Environmental Lab

255 W 36th Street, Suite 1503, New York, NY 10018

Laboratory ID: LAP-208306

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA LAP), LLC accreditation to the ISO/IEC 17025:2017 international standard, General Requirements for the Competence of Testing and Calibration Laboratories in the following:

LABORATORY ACCREDITATION PROGRAMS

☑	**INDUSTRIAL HYGIENE**	Accreditation Expires: August 01, 2023
☑	**ENVIRONMENTAL LEAD**	Accreditation Expires: August 01, 2023
☑	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires: August 01, 2023
☐	**FOOD**	Accreditation Expires:
☐	**UNIQUE SCOPES**	Accreditation Expires:

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached Scope of Accreditation. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2017 and AIHA LAP, LLC requirements. This certificate is not valid without the attached Scope of Accreditation. Please review the AIHA LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

Cheryl O. Morton

Cheryl O Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision19.1: 07/28/2021

Date Issued: 07/28/2021

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2023
Issued April 01, 2022

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. ROBERT Q. BRADLEY
YORK ANALYTICAL LABORATORIES INC
120 RESEARCH DRIVE
STRATFORD, CT 06615

NY Lab Id No: 10854

is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards (2016) for the category ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved analytes are listed below:

Polychlorinated Biphenyls

Aroclor 1016 (PCB-1016)	EPA 8082A
Aroclor 1016 (PCB-1016) in Oil	EPA 8082A
Aroclor 1221 (PCB-1221)	EPA 8082A
Aroclor 1221 (PCB-1221) in Oil	EPA 8082A
Aroclor 1232 (PCB-1232)	EPA 8082A
Aroclor 1232 (PCB-1232) in Oil	EPA 8082A
Aroclor 1242 (PCB-1242)	EPA 8082A
Aroclor 1242 (PCB-1242) in Oil	EPA 8082A
Aroclor 1248 (PCB-1248)	EPA 8082A
Aroclor 1248 (PCB-1248) in Oil	EPA 8082A
Aroclor 1254 (PCB-1254)	EPA 8082A
Aroclor 1254 (PCB-1254) in Oil	EPA 8082A
Aroclor 1260 (PCB-1260)	EPA 8082A
Aroclor 1260 (PCB-1260) in Oil	EPA 8082A
Aroclor 1262 (PCB-1262)	EPA 8082A
Aroclor 1262 (PCB-1262) in Oil	EPA 8082A
Aroclor 1268 (PCB-1268)	EPA 8082A
Aroclor 1268 (PCB-1268) in Oil	EPA 8082A

Polynuclear Aromatic Hydrocarbons

Acenaphthene	EPA 8270D
	EPA 8270E
Acenaphthylene	EPA 8270D

Serial No.: 65074

01213 006064102 47

NEW YORK STATE OF OPPORTUNITY. Department of Labor

ALEXANDER SMOLYAR

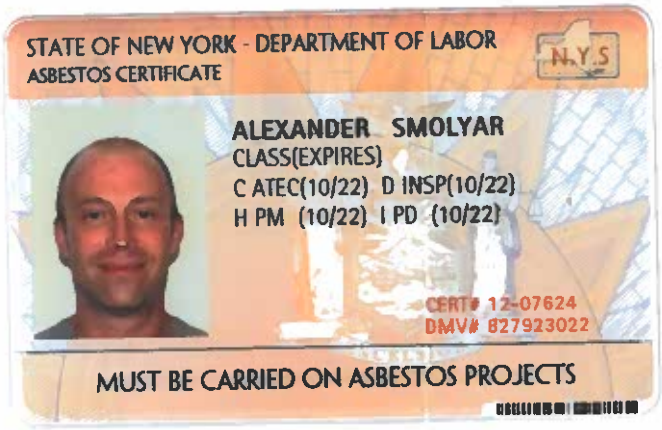
C/O LOUIS BERGER 96 MORTON ST, 8TH FL
NEW YORK NY 10014

Enclosed is your new card.

NYS Department of Labor

The Department of Labor is happy to provide this improved card. We welcome your comments: nysdol@labor.ny.gov or call (518) 457-2735

YOUR NEW CARD



United States Environmental Protection Agency

This is to certify that

Alexander Smolyar

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Risk Assessor

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires March 13, 2025

LBP-R-129050-2

Certification #

November 23, 2021

Issued On

Ben Conetta, Chief

Chemicals and Multimedia Programs Branch

01213 005960614 55

NEW YORK STATE OF OPPORTUNITY. Department of Labor

DMITRI KIRNOSSENKO

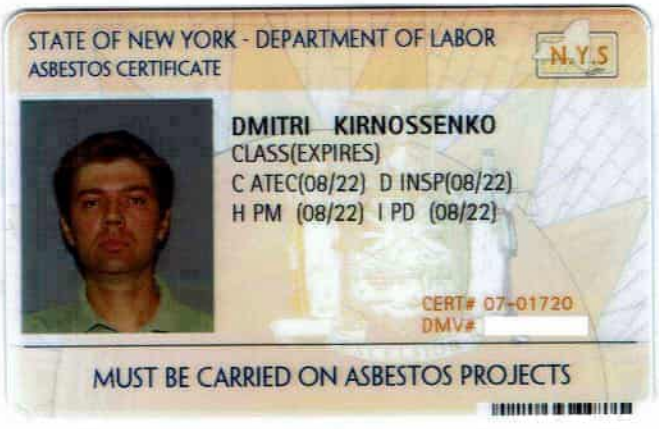
C/O LOUIS BERGER 96 MORTON ST 8TH FL
NEW YORK NY 10014

Enclosed is your new card.

NYS Department of Labor

The Department of Labor is happy to provide this improved card. We welcome your comments: nysdol@labor.ny.gov or call (518) 457-2735

YOUR NEW CARD



United States Environmental Protection Agency

This is to certify that

Dmitri Kirnossenko

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Inspector

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires October 01, 2023

LBP-I-16279-2

Certification #

June 19, 2020

Issued On

Ben Conetta, Chief

Chemicals and Multimedia Programs Branch

STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE

N.Y.S.

JOSUE GARCIA
CLASS(EXPIRES)
C ATEC(08/22) D INSP(08/22)
H PM (08/22) I PD (08/22)

CERT# 01-04282
DMV# 815004194

MUST BE CARRIED ON ASBESTOS PROJECTS

United States Environmental Protection Agency

This is to certify that

Josue Garcia

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Risk Assessor

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

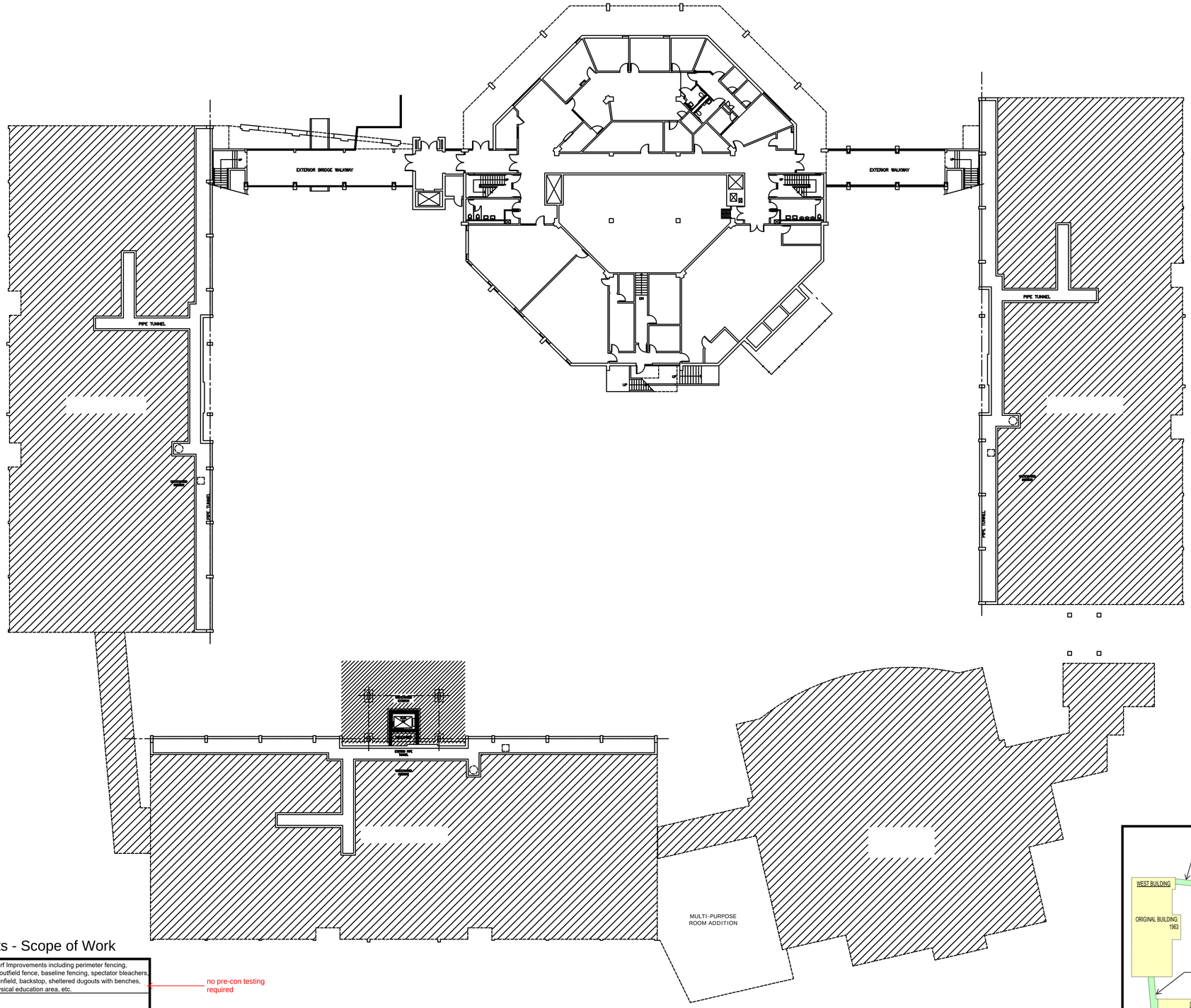
This certification is valid from the date of issuance and expires April 09, 2023

LBP-R-6928-2
Certification #

January 28, 2020
Issued On

Susan Schulz, Acting Chief
Chemicals and Multimedia Programs Branch

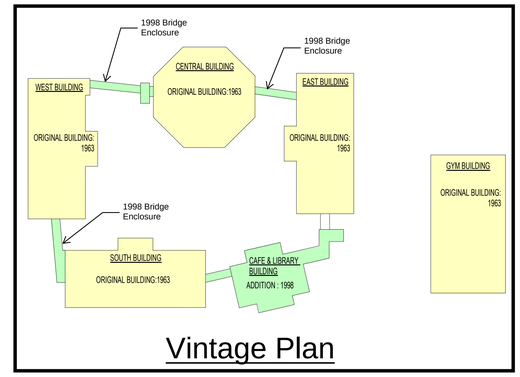
APPENDIX H:
SCOPE OF WORK DRAWINGS



Fox Lane MS Phase 1 Projects - Scope of Work

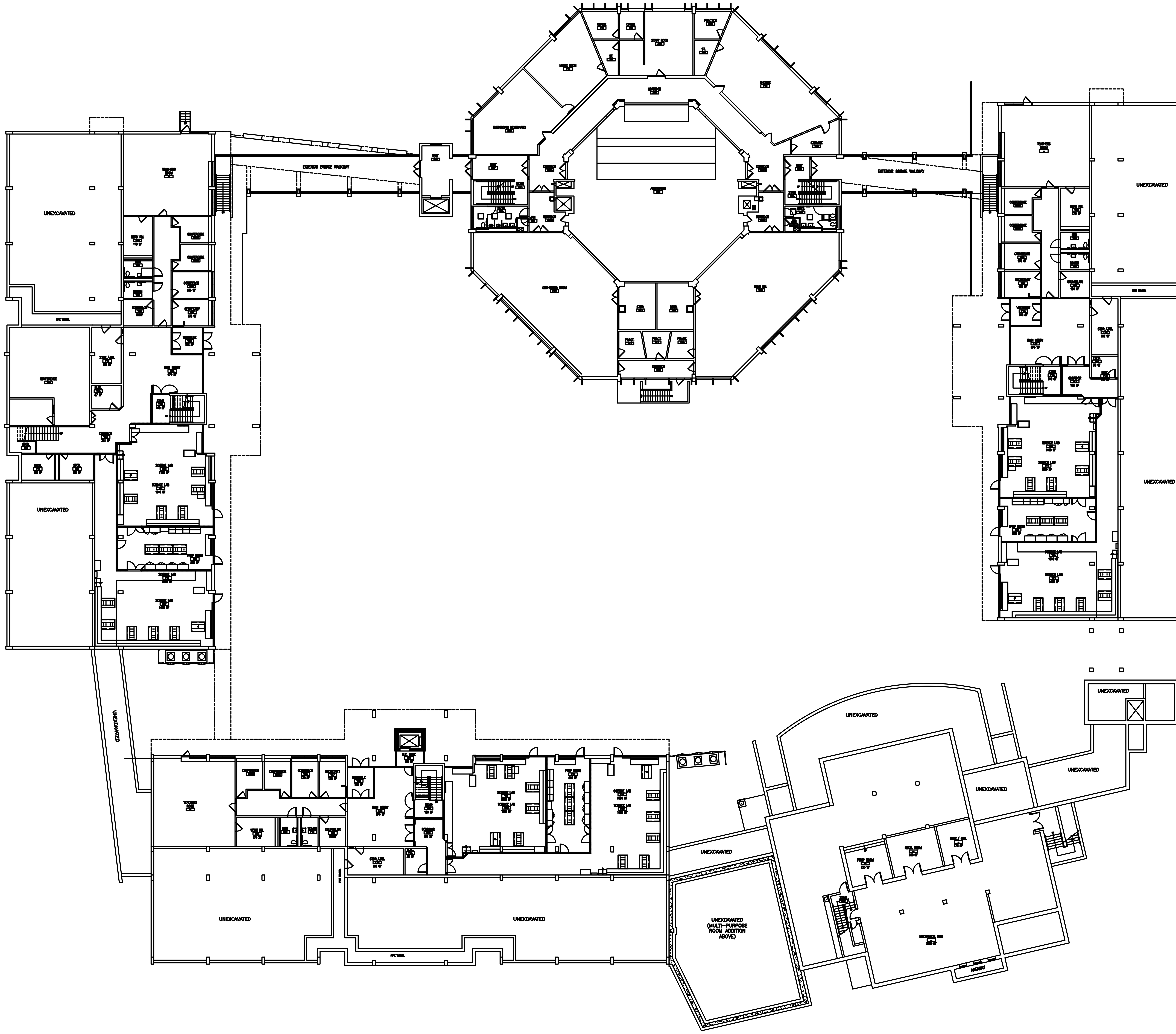
1.11	Fox Lane Middle School	Athletics 2	MS Softball natural Turf Improvements including perimeter fencing, accessible pathways, outfield fence, baseline fencing, spectator bleachers, softball field with clay infield, backstop, sheltered dugouts with benches, bullpen, additional physical education area, etc.	no pre-con testing required
1.12	Fox Lane Middle School	S-5	Provide site fencing between buildings for better security	no pre-con testing required
1.13	Fox Lane Middle School	Spatial-36	Renovate 6,102 SF Outdoor Shelter at Gym Building	
1.14	Fox Lane Middle School	FLMS S-7	Provide vehicle circulation and parking adjacent to middle school gym building/softball fields	no pre-con testing required
1.15	Fox Lane Middle School	FLMS A-5	Throughout the houses, approximately half of the doors have been replaced and half are original and should be replaced to comply w/ current codes. Replace non-compliant wood storage doors in corridors.	test all suspected materials at 1963 original building around original doors/frames. inside classroom and in corridors

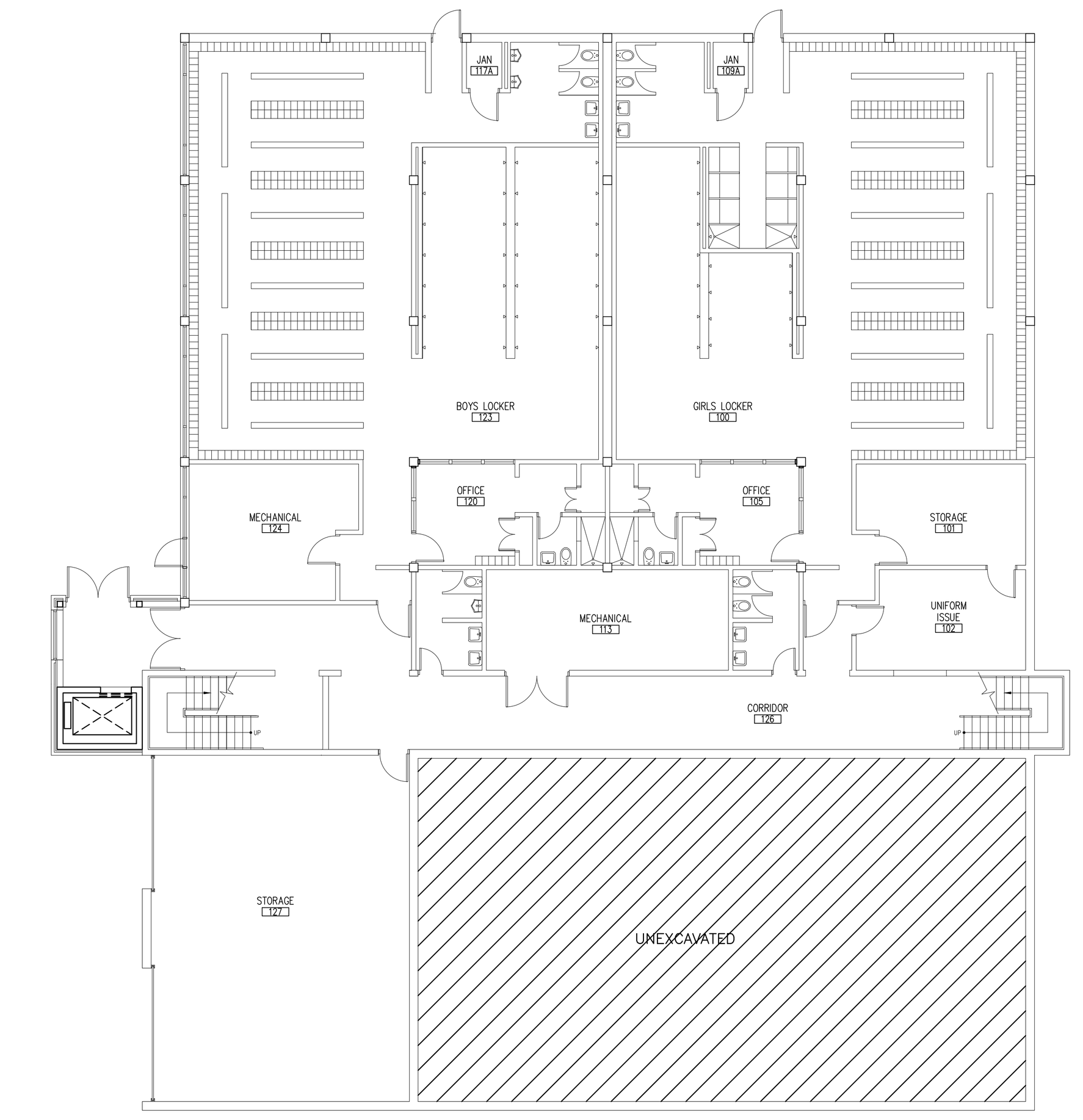
FIRST FLOOR
FOX LANE MIDDLE SCHOOL
BEDFORD CSD



Vintage Plan

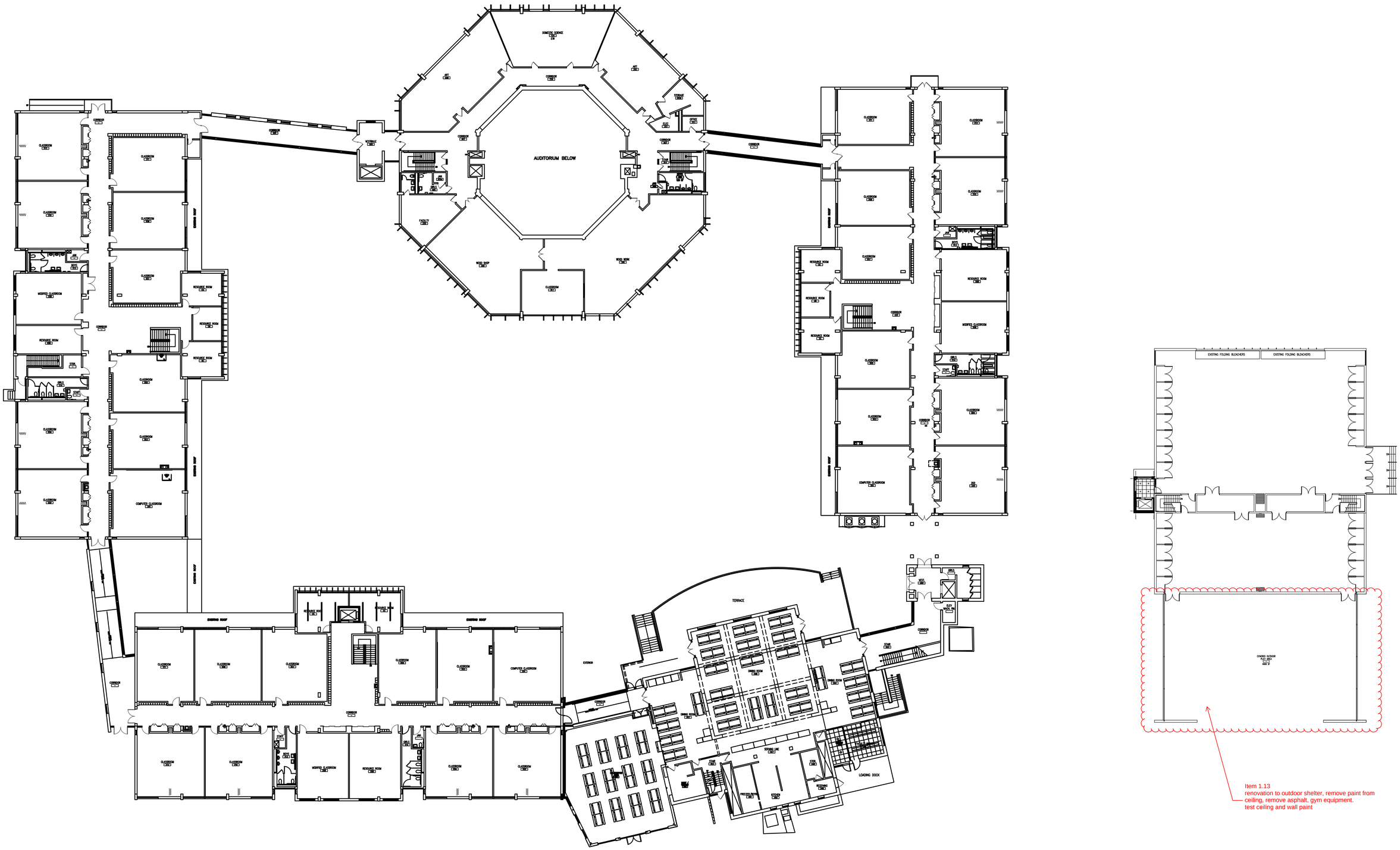
BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS





SECOND FLOOR
FOX LANE MIDDLE SCHOOL
BEDFORD CSD

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS



THIRD FLOOR
FOX LANE MIDDLE SCHOOL
BEDFORD CSD

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS

APPENDIX I:
FILE SEARCH

ASBESTOS TRIENNIAL INSPECTION REPORT

for

FOX LANE MIDDLE SCHOOL

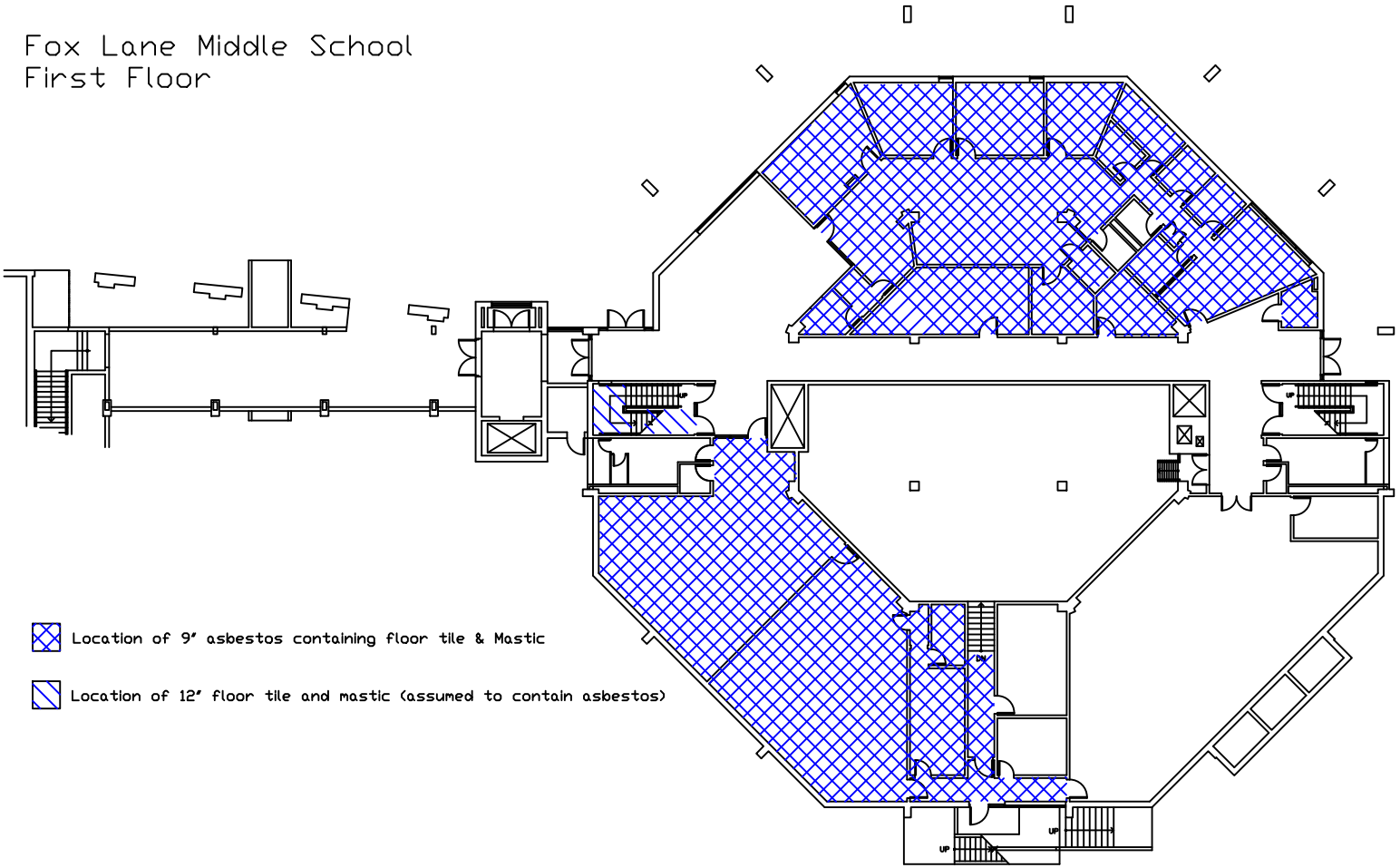
BEDFORD CENTRAL SCHOOL DISTRICT
Fox Lane Campus
Mount Kisco, New York 10528

by

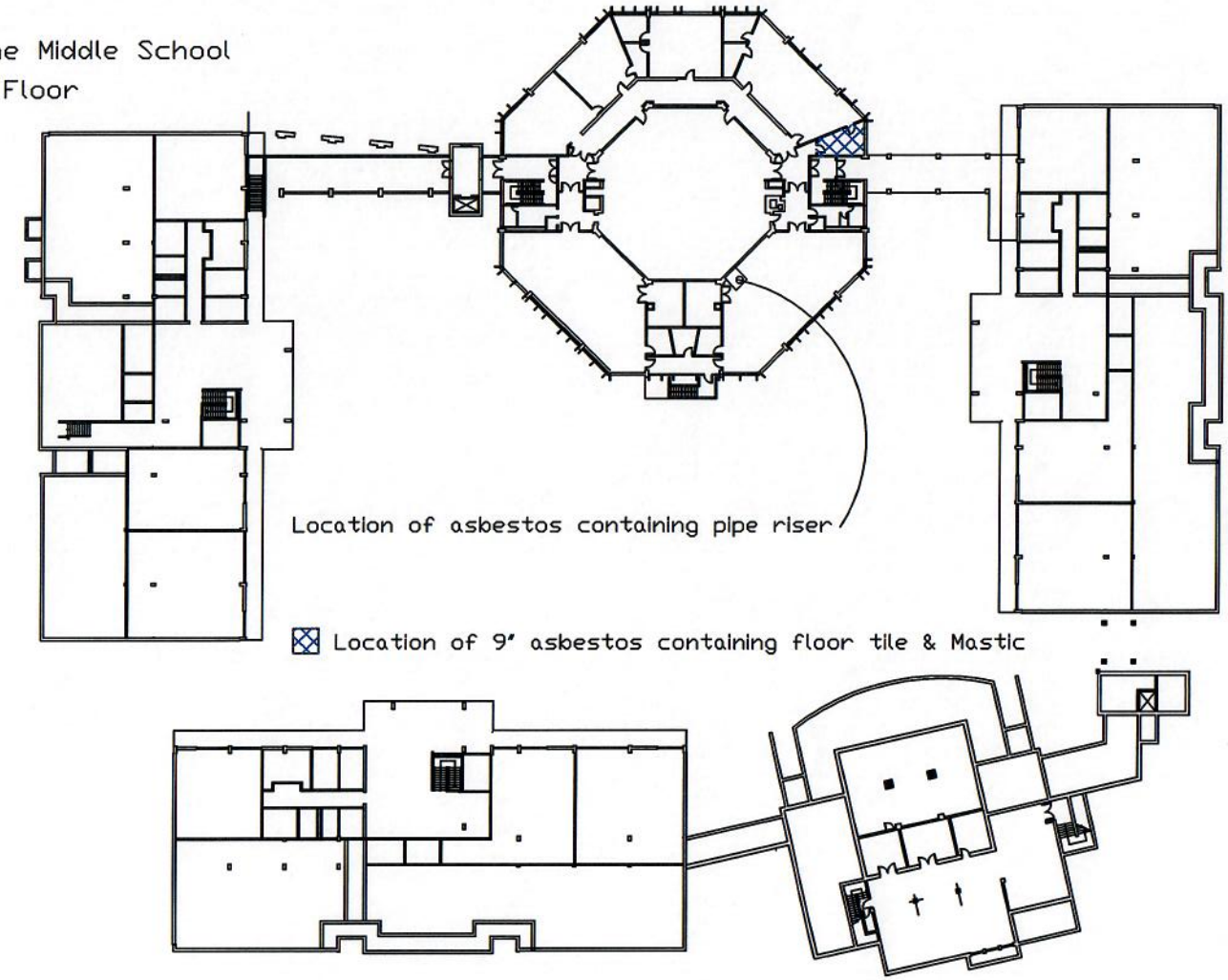
S & B ENVIRONMENTAL, LLC
7 Fairchild Road
Newtown, CT. 06470

12 May 2019

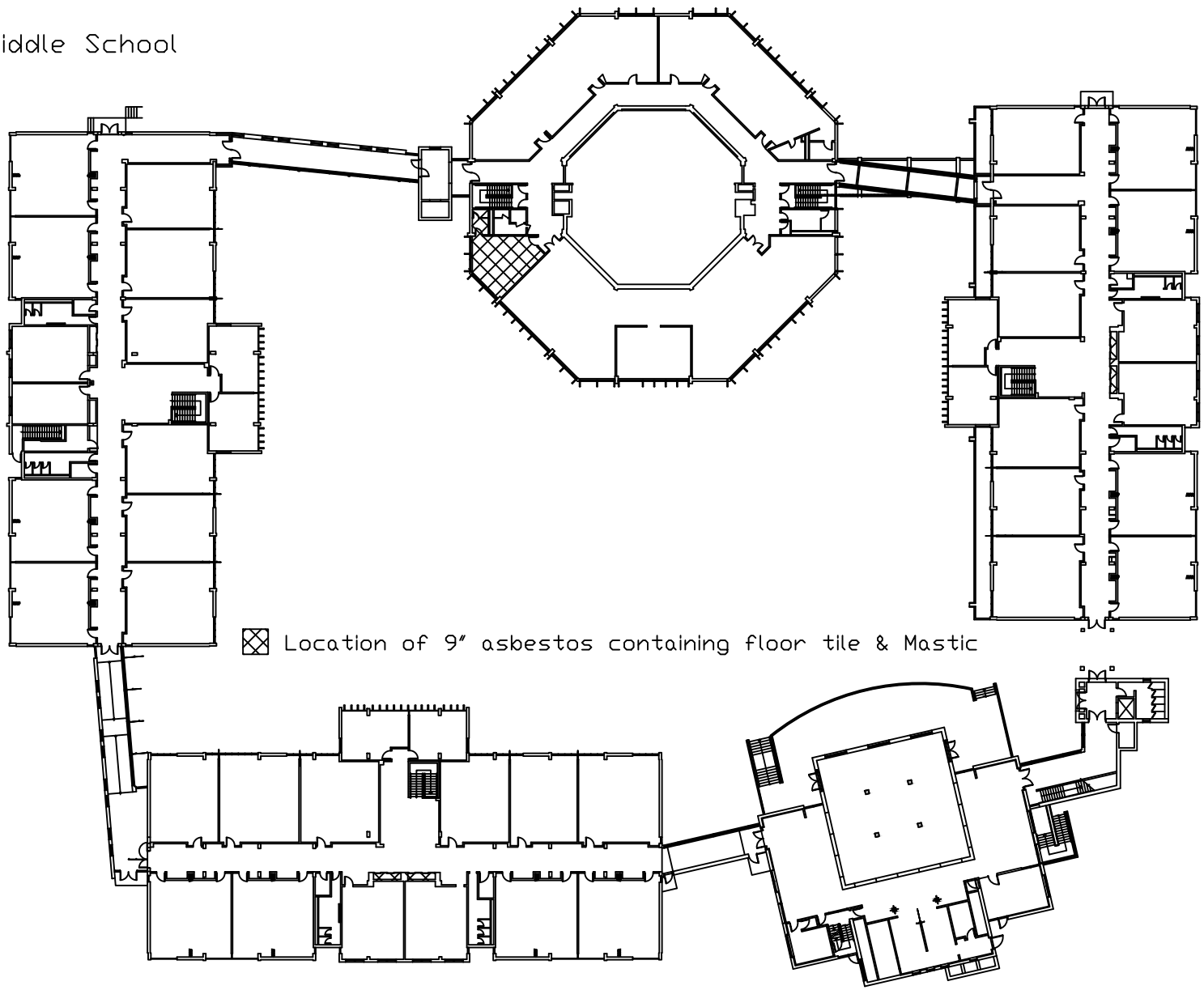
Fox Lane Middle School
First Floor



Fox Lane Middle School
Second Floor



Fox Lane Middle School
Third Floor



FINAL REPORT OF ENVIRONMENTAL SERVICES

Performed at:

MOUNT KISCO ELEMENTARY SCHOOL
SED SURVEY PROJECT
47 WEST HYATT AVENUE
MT. KISCO, NY 10549

Prepared for:

BEDFORD CENTRAL SCHOOL DISTRICT

Inspiring and Challenging Our Students

632 South Bedford Road
Bedford, NY 10506

Prepared by:

WSP USA Solutions, Inc.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
Tel. (914) 747-1120

Project No. 31405320.013
Final Submission Date: September 20, 2022

September 20, 2022

Mr. Dennis Rankin
Director of Facilities
Bedford Central School District
632 South Bedford Road
Bedford, NY 10506

Subject: **Final Report of Environmental Services**
SED Survey Project
Mount Kisco Elementary School
47 West Hyatt Avenue
Mt. Kisco, NY 10549

Dear Mr. Rankin:

WSP USA Solutions, Inc. has completed a material inspection at the Mount Kisco Elementary School located at 47 West Hyatt Avenue, Mt. Kisco, NY 10549. The inspection included visual observation, material sampling, and laboratory sample analysis of suspect Asbestos-Containing Materials (ACM), Lead Based Paints (LBP) and Polychlorinated Biphenyls (PCBs) as part of the SED Survey project at the Mount Kisco Elementary School.

The attached report presents descriptions and results of the material sampling procedures and visual analysis. Relevant general project information is provided, followed by our findings, assessments and recommendations. Laboratory analysis data and certifications are provided in the Appendices.

If you have any questions concerning this report or if we may be of further assistance to you, please contact us.

Sincerely,

WSP USA SOLUTIONS, INC.

Steven Eget, PE
Vice President, Earth & Environment Downstate NY Business Line Leader

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Appendices

1.0 EXECUTIVE SUMMARY

WSP USA Solutions, Inc. has performed a material inspection for the presence or absence of Asbestos-Containing Materials (ACM), Lead Based Paints (LBP) and Polychlorinated Biphenyls (PCBs) at the Mount Kisco Elementary School located at 47 West Hyatt Avenue, Mt. Kisco, NY 10549. The intent of this inspection was to screen for ACM, LBP and PCBs that may be impacted during the SED Survey project at the school noted above.

Dmitri Kirnossenko and Josue Garcia of WSP performed this inspection on August 26, 2022. Mr. Kirnossenko is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert#07-01720) and a licensed New York State EPA as a Lead Inspector (Cert# LBP-I-16279-2). Mr. Garcia is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert#01-04292) and a licensed New York State EPA as a Lead Risk Assessor (Cert# LBP-R-6928-2).

The results of the visual inspection and bulk sample analysis determined that the following suspect ACM, LBP and PCB materials may be impacted by the proposed SED Survey project at the school noted above:

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 08/26/2022 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **Ceiling Plaster (White Coat) - (Ground Floor, Room 022)**
- **Ceiling Plaster (Brown Coat) - (Ground Floor, Room 022)**

The following materials **Contain Asbestos as per AHERA Report:**

- **Plaster Ceiling (Ground Floor, Room 022)**
- **Floor Tiles and Mastic (Ground Floor, Office above Storage Room) - Not Affected by Current SOW**

Analytical results of the bulk samples collected on 08/26/2022 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Gypsum Board (White) - (Ground Floor)
- Joint Compound (White) - (Ground Floor)
- Single Coat Wall Plaster (Gray) - (Ground Floor)
- Cinderblock Wall Mortar (Gray) - (Ground Floor)
- Glazed Block Wall Mortar (Gray) - (Ground Floor)
- Ceramic Wall Tile Grout (White) - (Ground Floor)
- Ceramic Wall Tile Backing (White) - (Ground Floor)
- 2’x2’ Fissured Ceiling Tile (White) - (Ground Floor)
- 2’x2’ Smooth Ceiling Tile (Tan) - (Ground Floor)
- 2’x2’ Textured Ceiling Tile (White) - (Ground Floor)

- 1’x1’ Perforated Ceiling Tile (Brown) - (Ground Floor)
- 1’x1’ Fiberglass Ceiling Tile Glue (Brown) - (Ground Floor)
- Ceiling Plaster (White Coat) - (Ground Floor, Room 022)
- Ceiling Plaster (Brown Coat) - (Ground Floor, Room 022)
- Interior Window Frame Caulking (White) - (Ground Floor)
- Exterior Window Frame Caulking (White) - (Ground Floor)
- Exterior Stone Wall Mortar (Gray) - (Ground Floor)
- Asphalt (Black) - (Ground Floor)
- Foundation Wall Waterproofing (Black) - (Ground Floor)
- Gypsum Board (Gray) - (First Floor)
- Joint Compound (White) - (First Floor)
- Single Coat Wall Plaster (Gray) - (First Floor)
- Mastic Associated with 12”x12” Floor Tile (Black) - (First Floor)
- 12”x12” Floor Tile (White) - (First Floor)
- 12”x12” Floor Tile (Green) - (First Floor)
- 12”x12” Floor Tile (Yellow) - (First Floor)
- 12”x12” Floor Tile (Light Blue) - (First Floor)
- 6”x48” Self-Adhesive Floor Tile (Yellow) - (First Floor)
- Leveling Compound under Carpet Tile (Beige) - (First Floor)
- Mastic Associated with 4” Green Cove Base Molding (Brown) - (First Floor)
- 4” Cove Base Molding (Green) - (First Floor)
- Mastic Associated with 4” Red Cove Base Molding (Brown) - (First Floor)
- 4” Cove Base Molding (Red) - (First Floor)
- 2’x2’ Textured Ceiling Tile (White) - (First Floor)
- Single Coat Ceiling Plaster (Brown) - (First Floor)
- Gypsum Board (White) - (First Floor)
- Joint Compound (White) - (First Floor)
- Mastic Associated with 12”x12” White w/ Multicolor Specs Floor Tile (Black) - (First Floor)
- 12”x12” Floor Tile (White w/ Multicolor Specs) - (First Floor)
- Mastic Associated with 4” Green Cove Base Molding (Beige) - (First Floor)
- 4” Cove Base Molding (Green) - (First Floor)
- Exterior Brick Mortar (Brown) - (First Floor)
- Exterior Column Caulking (White) - (First Floor)
- Exterior Floor Expansion Joint Caulking (Gray) - (First Floor)
- Gypsum Board (White) - (Second Floor)
- Joint Compound (White) - (Second Floor)
- Single Coat Wall Plaster (Brown) - (Second Floor)
- Mastic Associated with 12”x12” Floor Tile (Black) - (Second Floor)
- 12”x12” Floor Tile (White) - (Second Floor)
- 12”x12” Floor Tile (Red) - (Second Floor)
- 12”x12” Floor Tile (Blue) - (Second Floor)
- Mastic Associated with 4” Red Cove Base Molding (Beige) - (Second Floor)
- 4” Cove Base Molding (Red) - (Second Floor)

B. LEAD-BASED PAINT

Based upon XRF readings, lead has been confirmed to exist in the following tested combinations:

- **White Paint on Wood Window Sill (Room 028)**
- **White Paint on Plaster Ceiling (Room 031)**
- **Beige Paint on Plaster Wall (Room 131)**
- **Beige Paint on Plaster Wall (Room 221)**

Lead was **not detected** in the following tested combinations via XRF readings:

- White Paint on Gypsum Wall (Room 022)
- White Paint on Ceramic Tile Wall (Room 022)
- White Paint on Metal Window Frame (Room 022)
- White Paint on Glazed Block Wall (Room 022)
- White Paint on Cinderblock Wall (Corridor by Room 025)
- Beige Paint on Metal Radiator Cover (Room 028)
- White Paint on Plaster Wall (Room 031)
- White Paint on Metal Electrical Conduit (Room 031)
- Beige Paint on Plaster Wall (Room 143)
- Beige Paint on Gypsum Wall (Room 143)
- Beige Paint on Wood Baseboard (Room 143)
- Beige Paint on Wood Baseboard (Room 131)
- Beige Paint on Wood Baseboard (Room 221)
- Beige Paint on Gypsum Wall (Room 222)

C. PCB-CONTAINING MATERIAL

Analytical results of the bulk samples collected indicate that the following materials **contain PCB** (greater than 50 PPM):

- **None**

Analytical results of the bulk samples collected indicate that the following materials **did not contain PCB** (less than 50 PPM):

- Interior Window Frame Caulking (White)) - (Ground Floor)
- Exterior Window Frame Caulking (White) - (Ground Floor)
- Exterior Column Caulking (White) - (Ground Floor)
- Exterior Floor Expansion Joint Caulking (Gray) - (Ground Floor)

2.0 FIELD INSPECTION PROCEDURES AND SAMPLE ANALYSIS METHODS

A. ASBESTOS-CONTAINING MATERIAL

Guidelines used for the inspection were established by the Environmental Protection Agency (EPA) in the Guidance for Controlling Asbestos Containing Materials in Buildings, Office of Pesticides and Toxic Substances, Doc 560/5-85-024, and 40 CFR Part 763, Asbestos Hazard Emergency Response Act (AHERA).

Field information was organized in accordance with the AHERA methodology of homogenous area (HA). During the Inspection, reasonable effort was made to identify all locations and types of ACM materials associated with the scope of work. Sampling has included multiple samples of the same materials chosen at random. However, due to inconsistencies of a manufacturer's processes and the contractor's installation methods, materials of similar construction may contain various amounts of asbestos. Furthermore, some materials that were not originally specified to contain asbestos may in fact contain this mineral. For example, cementitious pipe insulation and plaster were frequently mixed with asbestos at the construction site for ease of application. Locating all asbestos materials can only be definitively achieved by conducting exploratory demolition and sampling every section of pipe insulation, fitting or valve covering, fireproofing, and other suspect ACM.

Bulk samples of suspect ACM are analyzed using polarized light microscopy (PLM) coupled with dispersion staining, as described in 40 CFR Part 763 and the National Emissions Standard for Hazardous Air Pollutants (NESHAPS). NESHAPS is the standard industry protocol for the determination of asbestos in building materials. A suspect material is immersed in a solution of known refractive index and subjected to illumination by polarized light. The color displays that result are compared to a standardized atlas whereby the specific variety of asbestos is determined. It should also be recognized that PLM is primarily a qualitative identification method whereby asbestos percentage, if any, is estimated. While EPA, New York State, and New York City regulations governing ACM consider materials containing greater then 1-percent as asbestos, accurately quantifying asbestos content below 5-percent has been shown to be unreliable.

The New York State Department of Health has recently revised the PLM Stratified Point Counting Method. The March 25th, 2011 method, "Polarized Light Microscopy Methods for Identifying and Quantifying Asbestos in Bulk Samples" can be found as Item 198.1 in the Environmental Laboratory Approval program (ELAP) Certification manual. Whereas the procedure of analysis for bulk samples that fall into the category of "Non-friable Organically Bound" (NOB) can be found in the March 25th 2011 method "Polarized-Light Microscope Method for Identifying and Quantifying Asbestos in Non-Friable Organically Bound Bulk Samples", Item 198.6 in the ELAP Certification Manual. This category includes any sample in a flexible to rigid asphalt or vinyl matrix (floor tiles, mastic, roofing shingles, roofing felt, etc.). These samples must be "ashed" in a muffle furnace at 480-degrees Celsius (to remove organic matrix), treated with acid (to remove any mineral carbonate), and filtered through a 0.4-micron polycarbonate filter before being analyzed by PLM. The sample must be weighted between each of these steps to track the percent loss of organic matrix.

ELAP has determined that analysis of NOB materials is not reliably performed by PLM. Therefore, if PLM analysis yields results of 1-percent asbestos or less, the result must be confirmed by TEM. For bulk samples that undergo TEM analysis, the March 25th, 2011 method "Transmission Electron Microscope Method for Identifying and Quantitating Asbestos in Non-Friable organically Bound Bulk Samples" must be used and can be found as Item 198.4 in the ELAP Certification Manual. ELAP certified laboratories must include the following statement with their PLM analysis results for each "negative" (1-percent or less asbestos) NOB sample: "Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Before this material can be considered or treated as non-ACM, confirmation must be made by quantitative transmission electron microscopy".

All samples are initially analyzed by Polarized Light Microscopy in accordance with Item 198.1 and 198.6 of the ELAP Certification Manual. Samples which yield a negative PLM result and which are classified as a "non-friable" material, are then re-analyzed utilizing TEM methodology in accordance with Item 198.4 of the ELAP Certification Manual. The laboratory performing both these analysis procedures Atlas Environmental Lab, Corp. located at 255 West 36th Street, New York, NY 10018. The laboratory has received accreditation from the following agencies:

- National Voluntary Laboratory Accreditation Program (Lab Code 500092-0)
- New York State Environmental Laboratory Approval Program (Lab No. 11999)
- American Industrial Hygiene Association Accredited Laboratory (Lab No. 208306)

B. LEAD-BASED PAINT

Painted surfaces within the space equivalents in the scope of work were identified and grouped together by component type, substrate and visible color. In similar fashion, the inspection continued in each space equivalent with the identification of unique combinations of component, substrate and visible color. A random representative area of each unique combination was sampled and tested. For each of these designated components, an area on the component was chosen which represents the paint on that building component. During the inspection, components that are accessible surfaces, friction surfaces, impact surfaces, or have deteriorated paint was identified.

The readings of paint surfaces were taken using Heuresis Pb200i and RMD LPA-1 XRF Lead Paint Spectrum Analyzers. The Heuresis and LPA-1 method of measurement is based on the spectrometric analysis of lead K-shell X-ray fluorescence within a controlled depth of interrogation. The Heuresis and LPA-1 Analyzers uses a Co-57 radioactive source and an advanced, solid-state, room temperature, radiation detector to generate and detect the x-ray fluorescence spectrum of a painted surface. The spectrum is then analyzed by a microprocessor to eliminate the effects of substrate and other factors such as scattering to allow an accurate determination of the amount of lead on a surface. The Heuresis and LPA-1 automatically analyzes spectrometric data in real time and differentiates the lead signal from the spectrum. The x-ray fluorescence properties are determined through calibration process and are used for automatic substrate correction and calculation of the lead content of a painted surface.

For quality control, the XRF instrument was calibrated using a U.S. Department of Commerce National Institute of Standards and Technology (NIST) Level III 1.0 mg/cm2 lead based paint film. For each calibration, three (3) XRF readings were taken on the paint film. The average of these three (3) readings was then subtracted from the known lead content in the paint film. The difference was compared with an Environmental Protection Agency (EPA)-approved tolerance range. Such calibration procedures were conducted at the start and at the end of the workday

C. POLYCHLORINATED BIPHENYLS (PCBs)

PCBs belong to a broad family of man-made organic chemicals known as chlorinated hydrocarbons. PCBs were domestically manufactured from 1929 until their manufacture was banned in 1979. They have a range of toxicity and vary in consistency from thin, light-colored liquids to yellow or black waxy solids. Due to their non-flammability, chemical stability, high boiling point, and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics, and rubber products; in pigments, dyes, and carbonless copy paper; and many other industrial applications.

Although no longer commercially produced in the United States, PCBs may be present in products and materials produced before the 1979 PCB ban. Products that may contain PCBs include: Transformers and capacitors, Oil used in motors and hydraulic systems, Fluorescent light ballasts, Adhesives and tapes, Caulking, Plastics, etc.

The PCBs used in these products were chemical mixtures made up of a variety of individual chlorinated biphenyl components, known as congeners. Most commercial PCB mixtures are known in the United States by their industrial trade names. The most common trade name is aroclor.

Polychlorinated biphenyls (PCBs) are regulated pursuant to the United States Environmental Protection Agency Code of Federal Regulations (40 CFR Part 761) and the Toxic Substances Control Act (TSCA – 15 U.S.C. 2605). These regulations require certain testing and reporting requirements to determine management, recycling and disposal options for PCBs.

3.0 INSPECTION SCOPE AND MATERIAL ASSESSMENT

The areas inspected for ACM materials that may be impacted by the proposed SED Survey project at the Mount Kisco Elementary School. Locations surveyed include:

- Throughout Building

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 08/26/2022 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **Ceiling Plaster (White Coat) - (Ground Floor, Room 022)**
- **Ceiling Plaster (Brown Coat) - (Ground Floor, Room 022)**

The following materials **Contain Asbestos as per AHERA Report:**

- **Plaster Ceiling (Ground Floor, Room 022)**
- **Floor Tiles and Mastic (Ground Floor, Office above Storage Room) - Not Affected by Current SOW**

Analytical results of the bulk samples collected on 08/26/2022 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Gypsum Board (White) - (Ground Floor)
- Joint Compound (White) - (Ground Floor)
- Single Coat Wall Plaster (Gray) - (Ground Floor)
- Cinderblock Wall Mortar (Gray) - (Ground Floor)
- Glazed Block Wall Mortar (Gray) - (Ground Floor)
- Ceramic Wall Tile Grout (White) - (Ground Floor)
- Ceramic Wall Tile Backing (White) - (Ground Floor)
- 2'x2' Fissured Ceiling Tile (White) - (Ground Floor)
- 2'x2' Smooth Ceiling Tile (Tan) - (Ground Floor)
- 2'x2' Textured Ceiling Tile (White) - (Ground Floor)
- 1'x1' Perforated Ceiling Tile (Brown) - (Ground Floor)
- 1'x1' Fiberglass Ceiling Tile Glue (Brown) - (Ground Floor)
- Ceiling Plaster (White Coat) - (Ground Floor, Room 022)
- Ceiling Plaster (Brown Coat) - (Ground Floor, Room 022)
- Interior Window Frame Caulking (White) - (Ground Floor)
- Exterior Window Frame Caulking (White) - (Ground Floor)
- Exterior Stone Wall Mortar (Gray) - (Ground Floor)
- Asphalt (Black) - (Ground Floor)
- Foundation Wall Waterproofing (Black) - (Ground Floor)
- Gypsum Board (Gray) - (First Floor)
- Joint Compound (White) - (First Floor)
- Single Coat Wall Plaster (Gray) - (First Floor)
- Mastic Associated with 12"x12" Floor Tile (Black) - (First Floor)
- 12"x12" Floor Tile (White) - (First Floor)
- 12"x12" Floor Tile (Green) - (First Floor)
- 12"x12" Floor Tile (Yellow) - (First Floor)
- 12"x12" Floor Tile (Light Blue) - (First Floor)
- 6"x48" Self-Adhesive Floor Tile (Yellow) - (First Floor)
- Leveling Compound under Carpet Tile (Beige) - (First Floor)
- Mastic Associated with 4" Green Cove Base Molding (Brown) - (First Floor)
- 4" Cove Base Molding (Green) - (First Floor)
- Mastic Associated with 4" Red Cove Base Molding (Brown) - (First Floor)
- 4" Cove Base Molding (Red) - (First Floor)
- 2'x2' Textured Ceiling Tile (White) - (First Floor)

- Single Coat Ceiling Plaster (Brown) - (First Floor)
- Gypsum Board (White) - (First Floor)
- Joint Compound (White) - (First Floor)
- Mastic Associated with 12”x12” White w/ Multicolor Specs Floor Tile (Black) - (First Floor)
- 12”x12” Floor Tile (White w/ Multicolor Specs) - (First Floor)
- Mastic Associated with 4” Green Cove Base Molding (Beige) - (First Floor)
- 4” Cove Base Molding (Green) - (First Floor)
- Exterior Brick Mortar (Brown) - (First Floor)
- Exterior Column Caulking (White) - (First Floor)
- Exterior Floor Expansion Joint Caulking (Gray) - (First Floor)
- Gypsum Board (White) - (Second Floor)
- Joint Compound (White) - (Second Floor)
- Single Coat Wall Plaster (Brown) - (Second Floor)
- Mastic Associated with 12”x12” Floor Tile (Black) - (Second Floor)
- 12”x12” Floor Tile (White) - (Second Floor)
- 12”x12” Floor Tile (Red) - (Second Floor)
- 12”x12” Floor Tile (Blue) - (Second Floor)
- Mastic Associated with 4” Red Cove Base Molding (Beige) - (Second Floor)
- 4” Cove Base Molding (Red) - (Second Floor)

D. LEAD-BASED PAINT

Based upon XRF readings, lead has been confirmed to exist in the following tested combinations:

- **White Paint on Wood Window Sill (Room 028)**
- **White Paint on Plaster Ceiling (Room 031)**
- **Beige Paint on Plaster Wall (Room 131)**
- **Beige Paint on Plaster Wall (Room 221)**

Lead was **not detected** in the following tested combinations via XRF readings:

- White Paint on Gypsum Wall (Room 022)
- White Paint on Ceramic Tile Wall (Room 022)
- White Paint on Metal Window Frame (Room 022)
- White Paint on Glazed Block Wall (Room 022)
- White Paint on Cinderblock Wall (Corridor by Room 025)
- Beige Paint on Metal Radiator Cover (Room 028)
- White Paint on Plaster Wall (Room 031)
- White Paint on Metal Electrical Conduit (Room 031)
- Beige Paint on Plaster Wall (Room 143)
- Beige Paint on Gypsum Wall (Room 143)
- Beige Paint on Wood Baseboard (Room 143)

- Beige Paint on Wood Baseboard (Room 131)
- Beige Paint on Wood Baseboard (Room 221)
- Beige Paint on Gypsum Wall (Room 222)

E. PCB-CONTAINING MATERIAL

Analytical results of the bulk samples collected indicate that the following materials **contain PCB** (greater than 50 PPM):

- **None**

Analytical results of the bulk samples collected indicate that the following materials **did not contain PCB** (less than 50 PPM):

- Interior Window Frame Caulking (White)) - (Ground Floor)
- Exterior Window Frame Caulking (White) - (Ground Floor)
- Exterior Column Caulking (White) - (Ground Floor)
- Exterior Floor Expansion Joint Caulking (Gray) - (Ground Floor)

4.0 INSPECTION RESULTS

A. ASBESTOS-CONTAINING MATERIAL

The asbestos inspection involved a thorough visual examination of all areas that may be impacted by the proposed SED Survey project at the Mount Kisco Elementary School. The following suspect materials were sampled and analyzed for asbestos content by WSP:

4.1 Table 4.1 – Suspect Materials Inspected

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
WSP Sampled on 08/26/22			
01	Ground Floor	Gypsum Board (White)	NAD
02	Ground Floor	Joint Compound (White)	NAD
03	Ground Floor	Single Coat Wall Plaster (Gray)	NAD
04	Ground Floor	Cinderblock Wall Mortar (Gray)	NAD
05	Ground Floor	Glazed Block Wall Mortar (Gray)	NAD
06	Ground Floor	Ceramic Wall Tile Grout (White)	NAD
07	Ground Floor	Ceramic Wall Tile Backing (White)	NAD
08	Ground Floor	2’x2’ Fissured Ceiling Tile (White)	NAD
09	Ground Floor	2’x2’ Smooth Ceiling Tile (Tan)	NAD
10	Ground Floor	2’x2’ Textured Ceiling Tile (White)	NAD

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
11	Ground Floor	1'x1' Perforated Ceiling Tile (Brown)	NAD
12	Ground Floor	1'x1' Fiberglass Ceiling Tile Glue (Brown)	NAD
13	**Ground Floor (Room 022)**	**Ceiling Plaster (White Coat)**	**2.4% Chrysotile**
14	**Ground Floor (Room 022)**	**Ceiling Plaster (Brown Coat)**	**1.1% Chrysotile**
13A	Ground Floor (Room 028, Room 031)	Ceiling Plaster (White Coat)	NAD
14A	Ground Floor (Room 028, Room 031)	Ceiling Plaster (Brown Coat)	NAD
15	Ground Floor	Interior Window Frame Caulking (White)	NAD
16	Ground Floor	Exterior Window Frame Caulking (White)	NAD
17	Ground Floor	Exterior Stone Wall Mortar (Gray)	NAD
18	Ground Floor	Asphalt (Black)	NAD
19	Ground Floor	Foundation Wall Waterproofing (Black)	NAD
20	First Floor	Gypsum Board (Gray)	NAD
21	First Floor	Joint Compound (White)	NAD
22	First Floor	Single Coat Wall Plaster (Gray)	NAD
23	First Floor	Mastic Associated with 12"x12" Floor Tile (Black)	NAD
24	First Floor	12"x12" Floor Tile (White)	NAD
25	First Floor	12"x12" Floor Tile (Green)	NAD
26	First Floor	12"x12" Floor Tile (Yellow)	NAD
27	First Floor	12"x12" Floor Tile (Light Blue)	NAD
28	First Floor	6"x48" Self-Adhesive Floor Tile (Yellow)	NAD
29	First Floor	Leveling Compound under Carpet Tile (Beige)	NAD
30	First Floor	Mastic Associated with 4" Green Cove Base Molding (Brown)	NAD
31	First Floor	4" Cove Base Molding (Green)	NAD
32	First Floor	Mastic Associated with 4" Red Cove Base Molding (Brown)	NAD
33	First Floor	4" Cove Base Molding (Red)	NAD
34	First Floor	2'x2' Textured Ceiling Tile (White)	NAD
35	First Floor	Single Coat Ceiling Plaster (Brown)	NAD

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
36	First Floor	Gypsum Board (White)	NAD
37	First Floor	Joint Compound (White)	NAD
38	First Floor	Mastic Associated with 12”x12” White w/ Multicolor Specs Floor Tile (Black)	NAD
39	First Floor	12”x12” Floor Tile (White w/ Multicolor Specs)	NAD
40	First Floor	Mastic Associated with 4” Green Cove Base Molding (Beige)	NAD
41	First Floor	4” Cove Base Molding (Green)	NAD
42	First Floor	Exterior Brick Mortar (Brown)	NAD
43	First Floor	Exterior Column Caulking (White)	NAD
44	First Floor	Exterior Floor Expansion Joint Caulking (Gray)	NAD
45	Second Floor	Gypsum Board (White)	NAD
46	Second Floor	Joint Compound (White)	NAD
47	Second Floor	Single Coat Wall Plaster (Brown)	NAD
48	Second Floor	Mastic Associated with 12”x12” Floor Tile (Black)	NAD
49	Second Floor	12”x12” Floor Tile (White)	NAD
50	Second Floor	12”x12” Floor Tile (Red)	NAD
51	Second Floor	12”x12” Floor Tile (Blue)	NAD
52	Second Floor	Mastic Associated with 4” Red Cove Base Molding (Beige)	NAD
53	Second Floor	4” Cove Base Molding (Red)	NAD
AHERA Report			
-	**Ground Floor, Room 022**	**Plaster Ceiling**	**ACM**
-	**Ground Floor, Office above Storage Room**	**Floor Tiles and Mastic - Not Affected by Current SOW**	**ACM**

Bold = Positive for ACM NAD = No Asbestos Detected NA/PS = Not analyzed/ positive sample

4.2 CONDITION AND FRIABLITY ASSESSMENT TABLE

For each inspection conducted, the inspector classifies ACM or Assumed ACM materials by friability and condition. This helps to determine the extent of damage in certain areas as well as the potential for further damage and Asbestos release due to disturbance of the material.

Table 4.2 – Condition and Friability Assessment

Location	Material	Quantity	Friability	Condition
Ground Floor (Room 022)	Ceiling Plaster (White Coat)	600 SF	Friable	Damage
Ground Floor (Room 022)	Ceiling Plaster (Brown Coat)		Friable	Damage

Condition Definitions:
Good: None/Minimal apparent damage to ACM
Fair: Up to 10% localized damage or up to 25% of the entire ACM is damaged
Poor: Over 10% localized damage or over 25% of the entire ACM is damaged

4.3 SAMPLE ANALYSIS TABLE

Laboratory analysis results, in tabular form, are included in Appendix A.

B. LEAD-BASED PAINT

The lead Inspection involved a thorough visual examination of all accessible areas impacted by the proposed SED Survey project at the Mount Kisco Elementary School. The following suspect surfaces were tested for lead content:

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
Previous WSP Report dated 08/26/22						
1	Calibration Check @ 1.0	---	---	---	---	0.7
2	Calibration Check @ 1.0	---	---	---	---	0.7
3	Calibration Check @ 1.0	---	---	---	---	0.7
4	Calibration Check @ 0.0	---	---	---	---	0.0
5	Calibration Check @ 0.0	---	---	---	---	0.0
6	Calibration Check @ 0.0	---	---	---	---	0.0
7	Room 022	Wall	White	Gypsum	Intact	0.4
8	Room 022	Wall	White	Ceramic Tile	Intact	0.6
9	Room 022	Window Frame	White	Metal	Intact	0.4
10	Room 022	Wall	White	Glazed Block	Intact	0.2
11	Corridor by Room 025	Wall	White	Cinderblock	Intact	0.3
12	**Room 028**	**Window Sill**	**White**	**Wood**	**Intact**	**5.0**

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
13	Room 028	Radiator Cover	Beige	Metal	Intact	0.1
14	Room 031	Wall	White	Plaster	Intact	0.5
15	Room 031	Electrical Conduit	White	Metal	Intact	-0.1
16	**Room 031**	**Ceiling**	**White**	**Plaster**	**Intact**	**1.9**
17	Room 143	Wall	Beige	Plaster	Intact	0.5
18	Room 143	Wall	Beige	Gypsum	Intact	0.1
19	Room 143	Baseboard	Beige	Wood	Intact	-0.1
20	**Room 131**	**Wall**	**Beige**	**Plaster**	Intact	**7.1**
21	Room 131	Baseboard	Beige	Wood	Intact	0.0
22	**Room 221**	**Wall**	**Beige**	**Plaster**	Intact	**19.1**
23	Room 221	Baseboard	Beige	Wood	Intact	0.0
24	Room 222	Wall	Beige	Gypsum	Intact	0.2
25	Calibration Check @ 1.0	---	---	---	---	0.8
26	Calibration Check @ 1.0	---	---	---	---	0.7
27	Calibration Check @ 1.0	---	---	---	---	0.7
28	Calibration Check @ 0.0	---	---	---	---	-0.1
29	Calibration Check @ 0.0	---	---	---	---	-0.1
30	Calibration Check @ 0.0	---	---	---	---	-0.1

C. PCB-CONTAINING MATERIAL

The PCB Inspection involved a thorough visual examination of all areas that may be impacted by the proposed SED Survey project at the Mount Kisco Elementary School. The following suspect materials were tested for PCB content:

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	PCB CONTENT (PPM)
01	Ground Floor	Interior Window Frame Caulking (White))	ND
02	Ground Floor	Exterior Window Frame Caulking (White)	ND
03	First Floor	Exterior Column Caulking (White)	ND
04	First Floor	Exterior Floor Expansion Joint Caulking (Gray)	ND

5.0 AREAS NOT ACCESSIBLE

During the inspection the following areas were not accessible:

Spaces within Walls/Floors/Ceilings: No destructive sampling was performed on concealed spaces in walls to access plenum, chases etc. It should be assumed that asbestos containing materials may exist in these spaces. Any suspect materials encountered during work should be sampled for analysis before work continues.

Building Envelope: No destructive sampling was performed on the building envelope. It should be assumed that asbestos, lead and PCB containing materials may exist in these spaces. Any suspect materials encountered during work should be sampled for analysis before work continues.

6.0 CONCLUSIONS AND RECOMMENDATIONS

ACM & LBP was identified in this inspection that may be impacted as part of the proposed SED Survey project at the Mount Kisco Elementary School.

No PCB have been identified in this inspection that may be impacted as part of the proposed SED Survey project at the Mount Kisco Elementary School.

The ACM, LBP & PCB inspection was conducted at the request of Bedford Central School District for the proposed SED Survey project at the Mount Kisco Elementary School. Any change in the scope of work will require further investigation to accurately classify any additional ACM, LBP or PCBs resulting from the modified or updated scope of work.

7.0 REPORT CERTIFICATIONS

This report, and the supporting data, findings, conclusions, opinions, and recommendations it contains represent the result of WSP's efforts for the environmental inspection work for the Mount Kisco Elementary School, SED Survey project.

Opinions and recommendations presented in this report apply to site conditions and features as they existed at the time of WSP's site visits, and those reasonably foreseeable. They cannot necessarily apply to conditions and features of which WSP is unaware and has not had the opportunity to evaluate.

The conclusions presented in this report are professional opinions solely upon WSP's visual observations of accessible areas, laboratory test data, and current regulatory requirements. These conclusions are intended exclusively for the purpose stated herein and the site indicated for the project indicated.

Prepared by:

Josue Garcia
NYS DOL Inspector

Reviewed by:

Steven Eget, PE
Vice President

APPENDIX A:
ASBESTOS SAMPLE ANALYSIS RESULTS IN TABULAR FORM

APPENDIX A
SAMPLE ANALYSIS RESULTS IN TABULAR FORM
MOUNT KISCO ELEMENTARY SCHOOL
SED SURVEY PROJECT
47 WEST HYATT AVENUE
MT. KISCO, NY 10549

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
WSP Sampled on 08/26/2022					
01	01	Ground Floor, Room 023	Gypsum Board (White)	NAD	N/A
	02	Ground Floor, Room 028		NAD	N/A
02	03	Ground Floor, Room 023	Joint Compound (White)	NAD	N/A
	04	Ground Floor, Room 028		NAD	N/A
03	05	Ground Floor, Room 031	Single Coat Wall Plaster (Gray)	NAD	N/A
	06	Ground Floor, Room 031		NAD	N/A
	07	Ground Floor, Room 028		NAD	N/A
04	08	Ground Floor, Room 025	Cinderblock Wall Mortar (Gray)	NAD	N/A
	09	Ground Floor, Room 027		NAD	N/A
05	10	Ground Floor, Room 022	Glazed Block Wall Mortar (Gray)	NAD	N/A
	11	Ground Floor, Room 022		NAD	N/A
06	12	Ground Floor, Room 028	Ceramic Wall Tile Grout (White)	NAD	N/A
	13	Ground Floor, Room 025		NAD	N/A
07	14	Ground Floor, Room 028	Ceramic Wall Tile Backing (White)	NAD	N/A
	15	Ground Floor, Room 025		NAD	N/A
08	16	Ground Floor, Room 028	2'x2' Fissured Ceiling Tile (White)	NAD	NAD
	17	Ground Floor, Room 031		NAD	NAD
09	18	Ground Floor, Room 027	2'x2' Smooth Ceiling Tile (Tan)	NAD	NAD
	19	Ground Floor, Room 025		NAD	NAD
10	20	Ground Floor, Room 022	2'x2' Textured Ceiling Tile (White)	NAD	NAD
	21	Ground Floor, Room 023		NAD	NAD
11	22	Ground Floor, Room 025	1'x1' Perforated Ceiling Tile (Brown)	NAD	NAD
	23	Ground Floor, Room 027		NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
12	24	Ground Floor, Room 031	1'x1' Fiberglass Ceiling Tile Glue (Brown)	NAD	NAD
	25	Ground Floor, Room 031		NAD	NAD
13A	26	Ground Floor, Room 031	Ceiling Plaster (White Coat)	NAD	N/A
	27	Ground Floor, Room 028		NAD	N/A
	27A	Ground Floor, Room 028		NAD	N/A
14A	29	Ground Floor, Room 031	Ceiling Plaster (Brown Coat)	NAD	N/A
	30	Ground Floor, Room 028		NAD	N/A
	30A	Ground Floor, Room 028		NAD	N/A
13	**28**	**Ground Floor, Room 022**	**Ceiling Plaster (White Coat)**	**2.4% Chrysotile**	**N/A**
14	**31**	**Ground Floor, Room 022**	**Ceiling Plaster (Brown Coat)**	**1.1% Chrysotile**	**N/A**
15	32	Ground Floor, Room 028	Interior Window Frame Caulking (White)	NAD	NAD
	33	Ground Floor, Room 023		NAD	NAD
16	34	Ground Floor, Southwest	Exterior Window Frame Caulking (White)	NAD	NAD
	35	Ground Floor, West		NAD	NAD
17	36	Ground Floor, Southwest	Exterior Stone Wall Mortar (Gray)	NAD	N/A
	37	Ground Floor, West		NAD	N/A
18	38	Ground Floor, West Playground	Asphalt (Black)	NAD	NAD
	39	Ground Floor, West Playground		NAD	NAD
19	40	Ground Floor, Southwest	Foundation Wall Waterproofing (Black)	NAD	NAD
	41	Ground Floor, Southwest		NAD	NAD
20	42	First Floor, Room 168 Closet	Gypsum Board (Gray)	NAD	N/A
	43	First Floor, Room 143		NAD	N/A
21	44	First Floor, Room 168 Closet	Joint Compound (White)	NAD	N/A
	45	First Floor, Room 143		NAD	N/A
22	46	First Floor, Room 143	Single Coat Wall Plaster (Gray)	NAD	N/A
	47	First Floor, Room 140		NAD	N/A
	48	First Floor, Room 135		NAD	N/A
23	49	First Floor, Room 143	Mastic Associated with 12"x12" Floor Tile (Black)	NAD	NAD
	50	First Floor, Room 135		NAD	NAD
24	51	First Floor, Room 143	12"x12" Floor Tile (White)	NAD	NAD
	52	First Floor, Room 135		NAD	NAD
25	53	First Floor, Room 143	12"x12" Floor Tile (Green)	NAD	NAD
	54	First Floor, Room 135		NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
26	55	First Floor, Room 143	12”x12” Floor Tile (Yellow)	NAD	NAD
	56	First Floor, Room 135		NAD	NAD
27	57	First Floor, Room 169	12”x12” Floor Tile (Light Blue)	NAD	NAD
	58	First Floor, Room 169		NAD	NAD
28	59	First Floor, Room 168	6”x48” Self-Adhesive Floor Tile (Yellow)	NAD	NAD
	60	First Floor, Room 168		NAD	NAD
29	61	First Floor, Main Office	Leveling Compound under Carpet Tile (Beige)	NAD	N/A
	62	First Floor, Main Office		NAD	N/A
30	63	First Floor, Room 143	Mastic Associated with 4” Green Cove Base Molding (Brown)	NAD	NAD
	64	First Floor, Room 135		NAD	NAD
31	65	First Floor, Room 143	4” Cove Base Molding (Green)	NAD	NAD
	66	First Floor, Room 135		NAD	NAD
32	67	First Floor, Room 147	Mastic Associated with 4” Red Cove Base Molding (Brown)	NAD	NAD
	68	First Floor, Room 147		NAD	NAD
33	69	First Floor, Room 147	4” Cove Base Molding (Red)	NAD	NAD
	70	First Floor, Room 147		NAD	NAD
34	71	First Floor, Room 143	2’x2’ Textured Ceiling Tile (White)	NAD	NAD
	72	First Floor, Room 135		NAD	NAD
35	73	First Floor, Room 126	Single Coat Ceiling Plaster (Brown)	NAD	N/A
	74	First Floor, Room 135		NAD	N/A
	75	First Floor, Room 140		NAD	N/A
	76	First Floor, Room 143		NAD	N/A
	77	First Floor, Room 168		NAD	N/A
36	78	First Floor, Lobby N10	Gypsum Board (White)	NAD	N/A
	79	First Floor, Lobby N10		NAD	N/A
37	80	First Floor, Lobby N10	Joint Compound (White)	NAD	N/A
	81	First Floor, Lobby N10		NAD	N/A
38	82	First Floor, Lobby N10	Mastic Associated with 12”x12” White w/ Multicolor Specs Floor Tile (Black)	NAD	NAD
	83	First Floor, Lobby N10		NAD	NAD
39	84	First Floor, Lobby N10	12”x12” Floor Tile (White w/ Multicolor Specs)	NAD	NAD
	85	First Floor, Lobby N10		NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
40	86	First Floor, Lobby N10	Mastic Associated with 4" Green Cove Base Molding (Beige)	NAD	NAD
	87	First Floor, Lobby N10		NAD	NAD
41	88	First Floor, Lobby N10	4" Cove Base Molding (Green)	NAD	NAD
	89	First Floor, Lobby N10		NAD	NAD
42	90	First Floor, Main Entrance	Exterior Brick Mortar (Brown)	NAD	N/A
	91	First Floor, Main Entrance		NAD	N/A
43	92	First Floor, Main Entrance	Exterior Column Caulking (White)	NAD	NAD
	93	First Floor, Main Entrance		NAD	NAD
44	94	First Floor, Main Entrance	Exterior Floor Expansion Joint Caulking (Gray)	NAD	NAD
	95	First Floor, Main Entrance		NAD	NAD
45	96	Second Floor, Room 224	Gypsum Board (White)	NAD	N/A
	97	Second Floor, Room 211		NAD	N/A
46	98	Second Floor, Room 224	Joint Compound (White)	NAD	N/A
	99	Second Floor, Room 211		NAD	N/A
47	100	Second Floor, Room 227	Single Coat Wall Plaster (Brown)	NAD	N/A
	101	Second Floor, Room 218		NAD	N/A
	102	Second Floor, Room 211		NAD	N/A
48	103	Second Floor, Room 211	Mastic Associated with 12"x12" Floor Tile (Black)	NAD	NAD
	104	Second Floor, Room 218		NAD	NAD
49	105	Second Floor, Room 211	12"x12" Floor Tile (White)	NAD	NAD
	106	Second Floor, Room 218		NAD	NAD
50	107	Second Floor, Room 211	12"x12" Floor Tile (Red)	NAD	NAD
	108	Second Floor, Room 218		NAD	NAD
51	109	Second Floor, Room 21	12"x12" Floor Tile (Blue)	NAD	NAD
	110	Second Floor, Room 218		NAD	NAD
52	111	Second Floor, Room 211	Mastic Associated with 4" Red Cove Base Molding (Beige)	NAD	NAD
	112	Second Floor, Room 212		NAD	NAD
53	113	Second Floor, Room 211	4" Cove Base Molding (Red)	NAD	NAD
	114	Second Floor, Room 212		NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

APPENDIX B:
ASBESTOS BULK SAMPLE FIELD DATA SHEETS WITH CHAIN OF CUSODY & LABORATORY RESULTS

Atlas Environmental Lab, Corp.
255 West 36th Street, Suite# 1503
New York, NY 10018
Phone:(212) 563-0400 Fax:(212) 563-0401
www.atlasenvironmentallab.com

Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford Central School District / 31405320.013
Project Address: Mount Kisco ES, 47 West Hyatt Ave. Mt Kisco, NY
Collected By: Client
Work Area: Ground, 1st and 2nd Floors

AEL ID# BK0822446
Date Received: 8/29/2022
PLM Date Analyzed: 8/31/2022
TEM Date Analyzed: 9/1/2022
Report Date: 9/1/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
01-01	BK0822446-1	Ground Floor Room 023 - Gypsum Board, White	Beige/Brown, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	NAD		X		
01-02	BK0822446-2	Ground Floor Room 028 - Gypsum Board, White	Beige/Brown, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	NAD		X		
02-03	BK0822446-3	Ground Floor Room 023 - Joint Compound, White	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
02-04	BK0822446-4	Ground Floor Room 028 - Joint Compound, White	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
03-05	BK0822446-5	Ground Floor Room 031 - Single Coat Wall Plaster, Grey	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
03-06	BK0822446-6	Ground Floor Room 031 - Single Coat Wall Plaster, Grey	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
03-07	BK0822446-7	Ground Floor Room 028 - Single Coat Wall Plaster, Grey	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
04-08	BK0822446-8	Ground Floor by Room 025 - Cinderblock Wall Mortar, Grey	Beige, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
04-09	BK0822446-9	Ground Floor by Room 027 - Cinderblock Wall Mortar, Grey	Beige, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
05-10	BK0822446-10	Ground Floor Room 022 - Glazed Block Wall Mortar, Grey	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		

Atlas Environmental Lab, Corp.
255 West 36th Street, Suite# 1503
New York, NY 10018
Phone:(212) 563-0400 Fax:(212) 563-0401
www.atlasenvironmentallab.com

Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford Central School District / 31405320.013
Project Address: Mount Kisco ES, 47 West Hyatt Ave. Mt Kisco, NY
Collected By: Client
Work Area: Ground, 1st and 2nd Floors

AEL ID# BK0822446
Date Received: 8/29/2022
PLM Date Analyzed: 8/31/2022
TEM Date Analyzed: 9/1/2022
Report Date: 9/1/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
05-11	BK0822446-11	Ground Floor Room 022 - Glazed Block Wall Mortar, Grey	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
06-12	BK0822446-12	Ground Floor Room 028 - Ceramic Wall Tile Grout, White	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
06-13	BK0822446-13	Ground Floor Room 025 - Ceramic Wall Tile Grout, White	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
07-14	BK0822446-14	Ground Floor Room 028 - Ceramic Wall Tile Backing, White	White, Homogeneous, Non-Fibrous	18.8	1.4	79.7	0%	100%	NAD Inconclusive	NAD		X	X
07-15	BK0822446-15	Ground Floor Room 025 - Ceramic Wall Tile Backing, White	White, Homogeneous, Non-Fibrous	21.7	26.8	51.5	0%	100%	NAD Inconclusive	NAD		X	X
08-16	BK0822446-16	Ground Floor Room 028 - 2'x2' Fissured Ceiling Tile, White	Grey, Homogeneous, Non-Fibrous	13.0	84.5	2.4	0%	100%	NAD Inconclusive	NAD		X	X
08-17	BK0822446-17	Ground Floor Room 031 - 2'x2' Fissured Ceiling Tile, White	Grey, Homogeneous, Non-Fibrous	4.1	82.3	13.6	0%	100%	NAD Inconclusive	NAD		X	X
09-18	BK0822446-18	Ground Floor Room 027 - 2'x2' Smooth Ceiling Tile, Tan	Grey, Homogeneous, Non-Fibrous	10.6	84.5	4.9	0%	100%	NAD Inconclusive	NAD		X	X
09-19	BK0822446-19	Ground Floor Room 025 - 2'x2' Smooth Ceiling Tile, Tan	Grey, Homogeneous, Non-Fibrous	8.1	89.3	2.5	0%	100%	NAD Inconclusive	NAD		X	X
10-20	BK0822446-20	Ground Floor Room 022 - 2'x2' Textured Ceiling Tile, White	Grey, Homogeneous, Non-Fibrous	18.7	54.8	26.4	0%	100%	NAD Inconclusive	NAD		X	X

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Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford Central School District / 31405320.013
Project Address: Mount Kisco ES, 47 West Hyatt Ave. Mt Kisco, NY
Collected By: Client
Work Area: Ground, 1st and 2nd Floors

AEL ID# BK0822446
Date Received: 8/29/2022
PLM Date Analyzed: 8/31/2022
TEM Date Analyzed: 9/1/2022
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Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
10-21	BK0822446-21	Ground Floor Room 023 - 2'x2' Textured Ceiling Tile, White	Grey, Homogeneous, Non-Fibrous	8.7	72.8	18.5	0%	100%	**NAD** Inconclusive	**NAD**		X	X
11-22	BK0822446-22	Ground Floor Room 025 - 1'x1' Perforated Ceiling Tile, Brown	Brown, Homogeneous, Non-Fibrous	8.6	1.9	89.5	0%	100%	**NAD** Inconclusive	**NAD**		X	X
11-23	BK0822446-23	Ground Floor Room 027 - 1'x1' Perforated Ceiling Tile, Brown	Brown, Homogeneous, Non-Fibrous	15.5	3.6	80.9	0%	100%	**NAD** Inconclusive	**NAD**		X	X
12-24	BK0822446-24	Ground Floor Room 031 - 1'x1' Fiberglass Ceiling Tile Glue, Brown	Brown, Homogeneous, Non-Fibrous	7.1	25.7	67.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
12-25	BK0822446-25	Ground Floor Room 031 - 1'x1' Fiberglass Ceiling Tile Glue, Brown	Brown, Homogeneous, Non-Fibrous	7.4	20.9	71.6	0%	100%	**NAD** Inconclusive	**NAD**		X	X
13-26	BK0822446-26	Ground Floor Room 031 - Ceiling Plaster, White Coat	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
13-27	BK0822446-27	Ground Floor Room 028 - Ceiling Plaster, White Coat	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
13-28	BK0822446-28	Ground Floor Room 022 - Ceiling Plaster, White Coat	Tan, Homogeneous, Friable	Not Applicable			0%	97.6%	**2.4%CHRY**		X		
14-29	BK0822446-29	Ground Floor Room 031 - Ceiling Plaster, Brown Coat	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
14-30	BK0822446-30	Ground Floor Room 028 - Ceiling Plaster, Brown Coat	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		

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14-31	BK0822446-31	Ground Floor Room 022 - Ceiling Plaster, Brown Coat	Tan, Homogeneous, Friable	Not Applicable			0%	98.9%	**1.1%CHRY**		X		
15-32	BK0822446-32	Ground Floor Room 028 - Interior Window Frame Caulking, White	White, Homogeneous, Non-Fibrous	8.8	13.1	78.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
15-33	BK0822446-33	Ground Floor Room 023 - Interior Window Frame Caulking, White	White, Homogeneous, Non-Fibrous	8.2	14.7	77.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
16-34	BK0822446-34	Ground Floor Southwest - Exterior Window Frame Caulking, White	White, Homogeneous, Non-Fibrous	26.0	15.6	58.4	0%	100%	**NAD** Inconclusive	**NAD**		X	X
16-35	BK0822446-35	Ground Floor West - Exterior Window Frame Caulking, White	White, Homogeneous, Non-Fibrous	5.1	12.3	82.7	0%	100%	**NAD** Inconclusive	**NAD**		X	X
17-36	BK0822446-36	Ground Floor Southwest - Exterior Stone Wall Mortar, Grey	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
17-37	BK0822446-37	Ground Floor West - Exterior Stone Wall Mortar, Grey	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
18-38	BK0822446-38	Ground Floor West Playground - Asphalt, Black	Black, Homogeneous, Non-Fibrous	38.6	59.4	2.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
18-39	BK0822446-39	Ground Floor West Playground - Asphalt, Black	Black, Homogeneous, Non-Fibrous	10.6	7.5	81.9	0%	100%	**NAD** Inconclusive	**NAD**		X	X
19-40	BK0822446-40	Ground Floor Southwest - Foundation Wall Waterproofing, Black	Black, Homogeneous, Non-Fibrous	10.8	14.6	74.6	0%	100%	**NAD** Inconclusive	**NAD**		X	X

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19-41	BK0822446-41	Ground Floor Southwest - Foundation Wall Waterproofing, Black	Black, Homogeneous, Non-Fibrous	7.7	31.3	61.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
20-42	BK0822446-42	First Floor, Room 168 Closet - Gypsum Board, grey	Grey, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	**NAD**		X		
20-43	BK0822446-43	First Floor, Room 143 - Gypsum Board Grey	Grey, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	**NAD**		X		
21-44	BK0822446-44	First Floor, Room 168, Closet - Joint Compound, White	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
21-45	BK0822446-45	First Floor, Room 143, Closet - Joint Compound, White	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
22-46	BK0822446-46	First Floor Room 143 - Single Coat Wall Plaster, Grey	Beige, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
22-47	BK0822446-47	First Floor Room 140 - Single Coat Wall Plaster, Grey	Beige, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
22-48	BK0822446-48	First Floor Room 135 - Single Coat Wall Plaster, Grey	Beige, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
23-49	BK0822446-49	First Floor Room 143 - Mastic Associated with 12x12 Floor Tile, Black	Black, Homogeneous, Non-Fibrous	8.3	19.7	72.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
23-50	BK0822446-50	First Floor Room 135 - Mastic Associated with 12x12 Floor Tile, Black	Black, Homogeneous, Non-Fibrous	16.5	32.2	51.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X

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24-51	BK0822446-51	First Floor Room 143 - 12"x12" Floor Tile, White	Light Blue, Homogeneous, Non-Fibrous	5.2	14.7	80.1	0%	100%	NAD Inconclusive	NAD		X	X
24-52	BK0822446-52	First Floor Room 135 - 12"x12" Floor Tile, White	Light Blue, Homogeneous, Non-Fibrous	5.9	4.9	89.2	0%	100%	NAD Inconclusive	NAD		X	X
25-53	BK0822446-53	First Floor Room 143 - 12"x12" Floor Tile, Green	Green, Homogeneous, Non-Fibrous	7.3	12.3	80.4	0%	100%	NAD Inconclusive	NAD		X	X
25-54	BK0822446-54	First Floor Room 135 - 12"x12" Floor Tile, Green	Green, Homogeneous, Non-Fibrous	6.0	5.3	88.7	0%	100%	NAD Inconclusive	NAD		X	X
26-55	BK0822446-55	First Floor Room 143 - 12"x12" Floor Tile, Yellow	Orange, Homogeneous, Non-Fibrous	9.7	3.1	87.2	0%	100%	NAD Inconclusive	NAD		X	X
26-56	BK0822446-56	First Floor Room 135 - 12"x12" Floor Tile, Yellow	Orange, Homogeneous, Non-Fibrous	7.4	8.8	83.8	0%	100%	NAD Inconclusive	NAD		X	X
27-57	BK0822446-57	First Floor Room 169 - 12"x12" Floor Tile, Light Blue	Light Blue , Homogeneous, Non-Fibrous	4.7	5.3	90.0	0%	100%	NAD Inconclusive	NAD		X	X
27-58	BK0822446-58	First Floor Room 169 - 12"x12" Floor Tile, Light Blue	Light Blue , Homogeneous, Non-Fibrous	8.9	6.9	84.2	0%	100%	NAD Inconclusive	NAD		X	X
28-59	BK0822446-59	First Floor Room 168 - 6"x48" Self Adhesive Floor Tile, Yellow	Yellow, Homogeneous, Non-Fibrous	11.2	7.6	81.2	0%	100%	NAD Inconclusive	NAD		X	X
28-60	BK0822446-60	First Floor Room 168 - 6"x48" Self Adhesive Floor Tile, Yellow	Yellow, Homogeneous, Non-Fibrous	13.0	2.2	84.8	0%	100%	NAD Inconclusive	NAD		X	X

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							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
29-61	BK0822446-61	First Floor Main Office - Leveling Compound Under Carpet Tile, Beige	Beige, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
29-62	BK0822446-62	First Floor Main Office - Leveling Compound Under Carpet Tile, Beige	Beige, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
30-63	BK0822446-63	First Floor Room 143 - Mastic Associated with 4" Green Cove Base Molding, Brown	Brown, Homogeneous, Non-Fibrous	18.9	29.8	51.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X
30-64	BK0822446-64	First Floor Room 145 - Mastic Associated with 4" Green Cove Base Molding, Brown	Brown, Homogeneous, Non-Fibrous	27.7	29.6	42.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X
31-65	BK0822446-65	First Floor Room 143 - 4" Green Cove Base Molding, Green	Green, Homogeneous, Non-Fibrous	19.5	2.2	78.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X
31-66	BK0822446-66	First Floor Room 135 - 4" Green Cove Base Molding, Green	Green, Homogeneous, Non-Fibrous	12.4	3.2	84.4	0%	100%	**NAD** Inconclusive	**NAD**		X	X
32-67	BK0822446-67	First Floor Office 147 - Mastic Associated with 4" Red Cove Base Molding, Brown	Brown, Homogeneous, Non-Fibrous	14.0	25.0	61.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
32-68	BK0822446-68	First Floor Office 147 - Mastic Associated with 4" Red Cove Base Molding, Brown	Brown, Homogeneous, Non-Fibrous	16.5	29.1	54.4	0%	100%	**NAD** Inconclusive	**NAD**		X	X
33-69	BK0822446-69	First Floor Office 147 - 4" Cove Base Molding, Red	Purple, Homogeneous, Non-Fibrous	10.1	3.3	86.7	0%	100%	**NAD** Inconclusive	**NAD**		X	X
33-70	BK0822446-70	First Floor Office 147 - 4" Cove Base Molding, Red	Purple, Homogeneous, Non-Fibrous	19.2	1.8	78.9	0%	100%	**NAD** Inconclusive	**NAD**		X	X

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							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
34-71	BK0822446-71	First Floor Room 143 - 2'x2' Textured Ceiling Tile, White	Grey, Homogeneous, Non-Fibrous	2.6	87.6	9.7	0%	100%	**NAD** Inconclusive	**NAD**		X	X
34-72	BK0822446-72	First Floor Room 135 - 2'x2' Textured Ceiling Tile, White	Grey, Homogeneous, Non-Fibrous	8.3	89.1	2.6	0%	100%	**NAD** Inconclusive	**NAD**		X	X
35-73	BK0822446-73	First Floor Room 126 - Single Coat Ceiling Plaster, Brown	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
35-74	BK0822446-74	First Floor Room 135 - Single Coat Ceiling Plaster, Brown	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
35-75	BK0822446-75	First Floor Room 140 - Single Coat Ceiling Plaster, Brown	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
35-76	BK0822446-76	First Floor Room 143 - Single Coat Ceiling Plaster, Brown	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
35-77	BK0822446-77	First Floor Room 168 - Single Coat Ceiling Plaster, Brown	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
36-78	BK0822446-78	First Floor Lobby N10 - Gypsum Board, White	Beige, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	**NAD**		X		
36-79	BK0822446-79	First Floor Lobby N10 - Gypsum Board, White	Beige, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	**NAD**		X		
37-80	BK0822446-80	First Floor Lobby N10 - Joint Compound, White	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		

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37-81	BK0822446-81	First Floor Lobby N10 - Joint Compound, White	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
38-82	BK0822446-82	First Floor Lobby N10 - Mastic Associated With 12"x12" White W/ Multi Color Specs FT, Black	Black, Homogeneous, Non-Fibrous	30.8	14.6	54.6	0%	100%	NAD Inconclusive	NAD		X	X
38-83	BK0822446-83	First Floor Lobby N10 - Mastic Associated With 12"x12" White W/ Multi Color Specs FT, Black	Black, Homogeneous, Non-Fibrous	51.7	34.8	13.5	0%	100%	NAD Inconclusive	NAD		X	X
39-84	BK0822446-84	First Floor Lobby N10 - 12"x12" Floor Tile, White W/ Multi Color Specs	White, Homogeneous, Non-Fibrous	8.4	14.3	77.2	0%	100%	NAD Inconclusive	NAD		X	X
39-85	BK0822446-85	First Floor Lobby N10 - 12"x12" Floor Tile, White W/ Multi Color Specs	White, Homogeneous, Non-Fibrous	5.2	35.8	59.0	0%	100%	NAD Inconclusive	NAD		X	X
40-86	BK0822446-86	First Floor Lobby N10 - Mastic Associated with 4" Green Cove Base Molding, Beige	Beige, Homogeneous, Non-Fibrous	18.7	28.0	53.3	0%	100%	NAD Inconclusive	NAD		X	X
40-87	BK0822446-87	First Floor Lobby N10 - Mastic Associated with 4" Green Cove Base Molding, Beige	Beige, Homogeneous, Non-Fibrous	7.6	31.0	61.5	0%	100%	NAD Inconclusive	NAD		X	X
41-88	BK0822446-88	First Floor Lobby N10 - 4" Cove Base Molding, Green	Grey, Homogeneous, Non-Fibrous	16.1	4.9	79.0	0%	100%	NAD Inconclusive	NAD		X	X
41-89	BK0822446-89	First Floor Lobby N10 - 4" Cove Base Molding, Green	Grey, Homogeneous, Non-Fibrous	17.6	5.3	77.1	0%	100%	NAD Inconclusive	NAD		X	X
42-90	BK0822446-90	First Floor Main Entrance - Exterior Brick Mortar, Brown	Brown, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		

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42-91	BK0822446-91	First Floor Main Entrance - Exterior Brick Mortar, Brown	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
43-92	BK0822446-92	First Floor Main Entrance - Exterior Column Caulking, White	White, Homogeneous, Non-Fibrous	13.2	10.5	76.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X
43-93	BK0822446-93	First Floor Main Entrance - Exterior Column Caulking, White	White, Homogeneous, Non-Fibrous	10.8	30.4	58.9	0%	100%	**NAD** Inconclusive	**NAD**		X	X
44-94	BK0822446-94	First Floor Main Entrance - Exterior Floor Expansion Joint Caulking, Grey	Grey, Homogeneous, Non-Fibrous	11.3	13.2	75.5	0%	100%	**NAD** Inconclusive	**NAD**		X	X
44-95	BK0822446-95	First Floor Main Entrance - Exterior Floor Expansion Joint Caulking, Grey	Grey, Homogeneous, Non-Fibrous	18.3	11.6	70.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
45-96	BK0822446-96	Second Floor Room 224 - Gypsum Board, Grey	Grey, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	**NAD**		X		
45-97	BK0822446-97	Second Floor Room 211 - Gypsum Board, Grey	Grey, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	**NAD**		X		
46-98	BK0822446-98	Second Floor Room 224 - Joint Compound, White	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
46-99	BK0822446-99	Second Floor Room 211 - Joint Compound, White	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
47-100	BK0822446-100	Second Floor Room 227 - Single Coat Wall Plaster, Brown	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		

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Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford Central School District / 31405320.013
Project Address: Mount Kisco ES, 47 West Hyatt Ave. Mt Kisco, NY
Collected By: Client
Work Area: Ground, 1st and 2nd Floors

AEL ID# BK0822446
Date Received: 8/29/2022
PLM Date Analyzed: 8/31/2022
TEM Date Analyzed: 9/1/2022
Report Date: 9/1/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
47-101	BK0822446-101	Second Floor Room 218 - Single Coat Wall Plaster, Brown	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
47-102	BK0822446-102	Second Floor Room 211 - Single Coat Wall Plaster, Brown	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
48-103	BK0822446-103	Second Floor Room 211 - Mastic Associated With 12"x12" Floor Tile, Black	Black, Homogeneous, Non-Fibrous	35.4	13.9	50.8	0%	100%	NAD Inconclusive	NAD		X	X
48-104	BK0822446-104	Second Floor Room 218 - Mastic Associated With 12"x12" Floor Tile, Black	Black, Homogeneous, Non-Fibrous	21.0	27.2	51.8	0%	100%	NAD Inconclusive	NAD		X	X
49-105	BK0822446-105	Second Floor Room 211 - 12"x12" Floor Tile, White	Light Blue, Homogeneous, Non-Fibrous	8.9	4.1	87.0	0%	100%	NAD Inconclusive	NAD		X	X
49-106	BK0822446-106	Second Floor Room 218 - 12"x12" Floor Tile, White	Light Blue, Homogeneous, Non-Fibrous	4.4	1.5	94.1	0%	100%	NAD Inconclusive	NAD		X	X
50-107	BK0822446-107	Second Floor Room 211 - 12"x12" Floor Tile, Red	Red, Homogeneous, Non-Fibrous	9.5	3.1	87.3	0%	100%	NAD Inconclusive	NAD		X	X
50-108	BK0822446-108	Second Floor Room 218 - 12"x12" Floor Tile, Red	Red, Homogeneous, Non-Fibrous	13.7	34.5	51.8	0%	100%	NAD Inconclusive	NAD		X	X
51-109	BK0822446-109	Second Floor Room 211 - 12"x12" Floor Tile, Blue	Blue, Homogeneous, Non-Fibrous	9.2	1.2	89.6	0%	100%	NAD Inconclusive	NAD		X	X
51-110	BK0822446-110	Second Floor Room 218 - 12"x12" Floor Tile, Blue	Blue, Homogeneous, Non-Fibrous	8.3	23.2	68.5	0%	100%	NAD Inconclusive	NAD		X	X

Atlas Environmental Lab, Corp.
255 West 36th Street, Suite# 1503
New York, NY 10018
Phone:(212) 563-0400 Fax:(212) 563-0401
www.atlasenvironmentallab.com

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Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	AII %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
52-111	BK0822446-111	Second Floor Room 211 - Mastic Associated With 4" Red Cove Base Molding, Brown	Brown, Homogeneous, Non-Fibrous	26.7	3.9	69.4	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
52-112	BK0822446-112	Second Floor Room 212 - Mastic Associated With 4" Red Cove Base Molding, Brown	Brown, Homogeneous, Non-Fibrous	21.6	27.7	50.7	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
53-113	BK0822446-113	Second Floor Room 211 - 4" Cove Base Molding, Red	Red, Homogeneous, Non-Fibrous	29.0	1.7	69.2	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
53-114	BK0822446-114	Second Floor Room 211 - 4" Cove Base Molding, Red	Red, Homogeneous, Non-Fibrous	12.7	5.6	81.7	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**

MA

Quantitative Analysis (Semi/Full):Bulk Asbestos Analysis-PLM by EPA 600/M4-82-020 per 40 CFR or ELAP198.1 (friable) and 198.6 (NOB) samples for New York.

NAD=no asbestos detected, NA/PS=Not Analyzed/Positive Stop, Trace=<1%,FBGL=Fiberglass, CELL=Cellulose,CHRY=Chrysotile,Amo=Amosite,CRO=Crocidolite,ANTH=Anthophylite, TRE=Tremolite, ACT=Actinolite, NA=not applicable.

PLM is not consistently reliable in detecting Asbestos in floor coverings and similar non friable organically bound materials. NAD or Trace results by PLM are inconclusive.

TEM is currently the only method that can be used to determine if this material can be considered or treated as non asbestos containing in NY State.

All samples were prepared and analyzed in accordance with the EPA "TEM Method for Identifying and Quantifying Asbestos in Non-Fibrous Organically Bound Bulk Samples" ELAP 198.4".

ORG%=Ashed Organic%, AII= Acid Insoluble Inorganic%, ASI= Acid Soluble Inorganic%

NYS-ELAP#11999, NVLAP Lab Code: 500092-0, NJ ID: NY034 "ELCP on NJ won't apply to TEM", CT ID:PH-0154

PLM Analyst: AS TEM Analyst: VR Approved by:

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

BK0822446

PROJECT NO.: 31405320.013
CLIENT: Bedford Central School District
PROJECT SITE: Mount Kisco ES, 47 West Hyatt Ave., Mt Kisco, NY
Project Manager: Alex Smolyar

WSP
TELEPHONE NO. : (212) 612-7900
ADDRESS: One Penn Plaza, 4th Floor, New York, NY 10119

LOCATION(S) SURVEYED : Ground, 1st and 2nd Floors
PROPOSED PROJECT : SED Survey
DATE(S) OF INSPECTION: 08/26/2022
Inspector(s): Josue Garcia & Dmitri Kirnossenko

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐12 HR. ☐24 HR. ☐ 48 HR. X 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
01	01	Ground Floor Room 023	Gypsum Board, White		
	02	↓ ↓ 028	↓		
02	03	Ground Floor Room 023	Joint Compound, white		
	04	↓ ↓ 028	↓		
03	05	Ground Floor Room 031	Single Coat Wall Plaster, Gray		
	06	↓ ↓ ↓	↓		
	07	↓ ↓ 028	↓		
04	08	Ground Floor by Room 025	Cinderblock Wall Mortar, Gray		
	09	↓ Room 027	↓		
05	10	Ground Floor Room 022	Glazed Block Wall Mortar, Gray		
	11	↓ ↓ ↓	↓		

CHAIN OF CUSTODY

Relinquished by: (print) J. Garcia	(Sign)		8/29/22	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM
Received by: (print)	(Sign)		8/29/22	1515 AM/PM	Received by: (print)	(Sign)	/ /	AM/PM	Received by: (print)	(Sign)	/ /	AM/PM

Analyzed by Lab 09/01/22

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

BK0822 446

PROJECT NO.: 31405320.013
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Project Manager: Alex Smolyar

LOCATION(S) SURVEYED : Ground, 1st and 2nd Floors
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DATE(S) OF INSPECTION: 08/26/2022
Inspector(s): Josue Garcia & Dmitri Kirnossenko

WSP
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RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐12 HR. ☐24 HR. ☐ 48 HR. X 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
06	12	Ground Floor Room 028	Ceramic Wall Tile Grout, White		
	13	↓ ↓ 025	↓		
07	14	Ground Floor Room 028	Ceramic Wall Tile Backing, White		
	15	↓ ↓ 025	↓		
08	16	Ground Floor Room 028	2'x2' Fissured Ceiling Tile, White		
	17	↓ ↓ 031	↓		
09	18	Ground Floor Room 027	2'x2' Smooth Ceiling Tile, Tan		
	19	↓ ↓ 023	↓		
10	20	Ground Floor Room 022	2'x2' Textured Ceiling Tile, White		
	21	↓ ↓ 023	↓		
11	22	Ground Floor Room 025	1'x1' Perforated Ceiling Tile, Brown		
	23	↓ ↓ 027	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		Relinquished by: (print)	(Sign)		Relinquished by: (print)	(Sign)	
J. Garcia		8/29/22 AM/PM			/ / AM/PM			/ / AM/PM
Received by: (print)	(Sign)		Received by: (print)	(Sign)		Received by: (print)	(Sign)	
Dmitri Kirn		8-29-22 18:15 AM/PM			/ / AM/PM			/ / AM/PM

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ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

BKOX 22446

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TURNAROUND TIME: ☐12 HR. ☐24 HR. ☐ 48 HR. X 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
12	24	Ground Floor Room 031	1'x1' Fiberglass Ceiling Tile Glue,		
	25	↓ ↓ ↓	Brown		
13	26	Ground Floor Room 031	Ceiling Plaster, White Coat		
	27	↓ ↓ 028	↓		
	28	↓ ↓ 022	↓		
14	29	Ground Floor Room 031	Ceiling Plaster, Brown Coat		
	30	↓ ↓ 028	↓		
	31	↓ ↓ 022	↓		
15	32	Ground Floor Room 028	Interior Window Frame		
	33	↓ ↓ 023	Caulking, White		
16	34	Ground Floor Southwest	Exterior Window Frame		
	35	↓ West	Caulking, White		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)			Relinquished by: (print)	(Sign)			Relinquished by: (print)	(Sign)		
J. Garcia		8/29/22	AM/PM			/ /	AM/PM			/ /	AM/PM
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Anita Lico		8/29/22	15:15 AM/PM			/ /	AM/PM			/ /	AM/PM

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PROPOSED PROJECT : SED Survey
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HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
17	36	Ground Floor Southwest	Exterior Stone Wall Mortar, Gray		
	37	↓ West	↓		
18	38	Ground Floor West Playground	Asphalt, Black		
	39	↓ ↓	↓		
19	40	Ground Floor Southwest	Foundation Wall Waterproofing,		
	41	↓ ↓	↓ Black		
20	42	First Floor Room 168 closet	Gypsum Board, Gray		
	43	↓ Room 143	↓		
21	44	First Floor Room 168 closet	Joint Compound, White		
	45	↓ Room 143	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)			Relinquished by: (print)	(Sign)			Relinquished by: (print)	(Sign)		
J. Garcia		8/29/22	AM/PM			/ /	AM/PM			/ /	AM/PM
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		8/29/22	15:15 AM/PM			/ /	AM/PM			/ /	AM/PM

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1191

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

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HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
22	46	First Floor Room 143	Single Coat Wall Plaster, Gray		
	47	↓ 140	↓		
	48	↓ 135	↓		
23	49	First Floor Room 143	Mastic Associated with 12"x12"		If Positive Don't Analyze HA #s 24, 25, 26 & 27
	50	↓ ↓ 135	Floor Tile, Black		↓
24	51	First Floor Room 143	12"x12" Floor Tile, White		↓
	52	↓ ↓ 135	↓		↓
25	53	First Floor Room 143	12"x12" Floor Tile, Green		↓
	54	↓ ↓ 135	↓		↓
26	55	First Floor Room 143	12"x12" Floor Tile, Yellow		↓
	56	↓ ↓ 135	↓		↓

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
J. Garcia		8/29/22				/ /				/ /	
Received by: (print) Alex Gow	(Sign)	8/29/22	15:15 AM/PM	Received by: (print)	(Sign)	/ /	AM/PM	Received by: (print)	(Sign)	/ /	AM/PM

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HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
27	57	First Floor Room 169	12"x12" Floor Tile, Light Blue		
	58	↓ ↓	↓		
28	59	First Floor Room 168	6"x48" Self Adhesive Floor		
	60	↓ ↓	Tile, Yellow		
29	61	First Floor Main Office	Leveling Compound under		
	62	↓ ↓	Carpet Tile, Beige		
30	63	First Floor Room 143	Mastic Associated with 4" Green		If Positive Dont Analyze HA # 31
	64	↓ ↓ 135	Cove Base Molding, Brown		↓
31	65	First Floor Room 143	4" Cove Base Molding, Green		
	66	↓ ↓ 135	↓		
32	67	First Floor Office 147	Mastic Associated with 4" Red		If Positive Dont Analyze HA # 33
	68	↓ ↓ ↓	Cove Base Molding, Brown		↓

CHAIN OF CUSTODY

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J. Garcia		8/29/22	AM/PM			/ /	AM/PM			/ /	AM/PM
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Keith Ciw		8/29/22	15:11 AM/PM			/ /	AM/PM			/ /	AM/PM

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ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

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TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. X 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
33	69	First Floor Office 147	4" Cove Base Molding, Red		
	70	↓ ↓ ↓	↓		
34	71	First Floor Room 143	2'x2' Textured Ceiling Tile, White		
	72	↓ ↓ 135	↓		
35	73	First Floor Room 126	Plaster Single Coat Ceiling ~~Tile~~, Brown		
	74	↓ ↓ 135	↓		
	75	↓ ↓ 140	↓		
	76	↓ ↓ 143	↓		
	77	↓ ↓ 168	↓		
36	78	First Floor Lobby N10	Gypsum Board, White		
	79	↓ ↓	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
J. Garcia		8/29/22									
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
		8/29/22	11:13								

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

1191

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

BK08224616

PROJECT NO.: 31405320.013
CLIENT: Bedford Central School District
PROJECT SITE: Mount Kisco ES, 47 West Hyatt Ave., Mt Kisco, NY
Project Manager: Alex Smolyar

WSP
TELEPHONE NO. : (212) 612-7900
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LOCATION(S) SURVEYED : Ground, 1st and 2nd Floors
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Inspector(s): Josue Garcia & Dmitri Kirnossenko

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. X 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
37	80	First Floor Lobby N10	Joint Compound, White		
	81	↓ ↓	↓		
38	82	First Floor Lobby N10	Mastic Associated with 12"x12"		If Positive Dont Analyze HA # 39
	83	↓ ↓	White w/Multi color specs FT, Black		↓
39	84	First Floor Lobby N10	12"x12" Floor Tile, White w/Multicolor specs		
	85	↓ ↓	↓		
40	86	First Floor Lobby N10	Mastic Associated with 4" Green		If Positive Dont Analyze HA # 41
	87	↓ ↓	Cove Base Molding, Beige		↓
41	88	First Floor Lobby N10	4" Cove Base Molding, Green		
	89	↓ ↓	↓		
42	90	First Floor Main Entrance	Exterior Brick Mortar, Brown		
	91	↓ ↓	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)			Relinquished by: (print)	(Sign)			Relinquished by: (print)	(Sign)		
J. Garcia		8/29/22	AM/PM			/ /	AM/PM			/ /	AM/PM
Received by: (print)	(Sign)			Received by: (print)	(Sign)			Received by: (print)	(Sign)		
		8/29/22	15:45 AM/PM			/ /	AM/PM			/ /	AM/PM

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ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

BK08 22446

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HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
43	92	First Floor Main Entrance	Exterior column Caulking, White		
	93	↓ ↓	↓		
44	94	First Floor Main Entrance	Exterior Floor Expansion Joint		
	95	↓ ↓	Caulking, Gray		
45	96	Second Floor Room 224	Gypsum Board, Gray		
	97	↓ Room 211 ext	↓		
46	98	Second Floor Room 224	Joint compound, White		
	99	↓ ↓ 211	↓		
47	100	Second Floor Room 227	Single coat Wall Plaster, Brown		
	101	↓ ↓ 218	↓		
	102	↓ ↓ 211	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
J. Garcia+		8/29/22				/ /				/ /	
Received by: (print) Aleeta Lew	(Sign)	8/29/22	11:15 AM/PM	Received by: (print)	(Sign)	/ /	AM/PM	Received by: (print)	(Sign)	/ /	AM/PM

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ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

B1C0822446

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HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
48	103	Second Floor Room 211	Mastic Associated with 12"x 12"		If Positive Don't Analyze HA # 49, 50 & 51
	104	↓ ↓ 218	Floor Tile, Black		
49	105	Second Floor Room 211	12"x12" Floor Tile, White		
	106	↓ ↓ 218	↓		
50	107	Second Floor Room 211	12"x12" Floor Tile, Red		
	108	↓ ↓ 218	↓		
51	109	Second Floor Room 211	12"x12" Floor Tile, Blue		
	110	↓ ↓ 218	↓		
52	111	Second Floor Room 211	Mastic Associated with 4" Red		If Positive Don't Analyze HA # 53
	112	↓ ↓ 212	Cove Base Molding, Brown		
53	113	Second Floor Room 211	4" Cove Base Molding, Red		
	114	↓ ↓ 212	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)	Date	AM/PM	Received by: (print)	(Sign)	Date	AM/PM
J. Garcia+		8 29 22					
		8 29 22					

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

Atlas Environmental Lab, Corp.
255 West 36th Street, Suite# 1503
New York, NY 10018
Phone:(212) 563-0400 Fax:(212) 563-0401
www.atlasenvironmentallab.com

Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: 31405320.013 / Bedford Central School District
Project Address: Mt. Kisco ES, 47 West Hyatt Ave, Mt. Kisco, NY
Collected By: Client
Work Area:

AEL ID# BK0922191
Date Received: 9/14/2022
PLM Date Analyzed: 9/14/2022
TEM Date Analyzed:
Report Date: 9/17/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	AII %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
13A-27q	BK0922191-1	Ground Floor, Room 208, Adj 1 Door Entry - Ceiling Plaster, White Coat	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
14A-28q	BK0922191-2	Ground Floor, Room 208, Adj 1 Door Entry - Ceiling Plaster, Brown Coat	Brown, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		

MG

Quantitative Analysis (Semi/Full):Bulk Asbestos Analysis-PLM by EPA 600/M4-82-020 per 40 CFR or ELAP198.1 (friable) and 198.6 (NOB) samples for New York.

NAD=no asbestos detected, NA/PS=Not Analyzed/Positive Stop, Trace=<1%,FBGL=Fiberglass, CELL=Cellulose,CHRY=Chrysotile,Amo=Amosite,CRO=Crocidolite,ANTH=Anthophylite, TRE=Tremolite, ACT=Actinolite, NA=not applicable.

PLM is not consistently reliable in detecting Asbestos in floor coverings and similar non friable organically bound materials. NAD or Trace results by PLM are inconclusive.

TEM is currently the only method that can be used to determine if this material can be considered or treated as non asbestos containing in NY State.

All samples were prepared and analyzed in accordance with the EPA "TEM Method for Identifying and Quantifying Asbestos in Non-Fibrous Organically Bound Bulk Samples" ELAP 198.4".

ORG%=Ashed Organic%, AII= Acid Insoluble Inorganic%, ASI= Acid Soluble Inorganic%

This "Summary of Analytical Results "shall not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, ELAP or any agency of the U.S Government. The results relate only to the items tested. This report may not be reproduced, except in full, without the written approval of AEL .Atlas Environmental lab did not collect the analyzed samples and thus accepts no liability with regard to their collection and/or maintenance . AEL relies on client's data. The liability of Atlas Environmental Lab corp with respect to the services charged, shall in no event exceed the amount of the invoice.

NYS-ELAP#11999, NVLAP Lab Code: 500092-0, NJ ID: NY034 "ELCP on NJ won't apply to TEM", CT ID:PH-0154

PLM Analyst: FC TEM Analyst: Approved by:

1191

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 1 OF 1

BK0922191

PROJECT NO.: 31405320.013
CLIENT: BEDFORD CENTRAL SCHOOL DISTRICT
PROJECT SITE: MT. KISCO ES, 47 WEST HYATT AVE, MT. KISCO, NY
Project Manager: ALEX SMOLYAR

LOCATION(S) SURVEYED: GROUND
PROPOSED PROJECT: SED SURVEY
DATE(S) OF INSPECTION: 9.13.2022
Inspector(s): STEPHEN GRUBER

WSP
TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014

RESULTS TO: Lb.Labresults@wsp.com
alexander.smolyar@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☑ 24 HR. ☐ 48 HR. ☒ 72 HR.

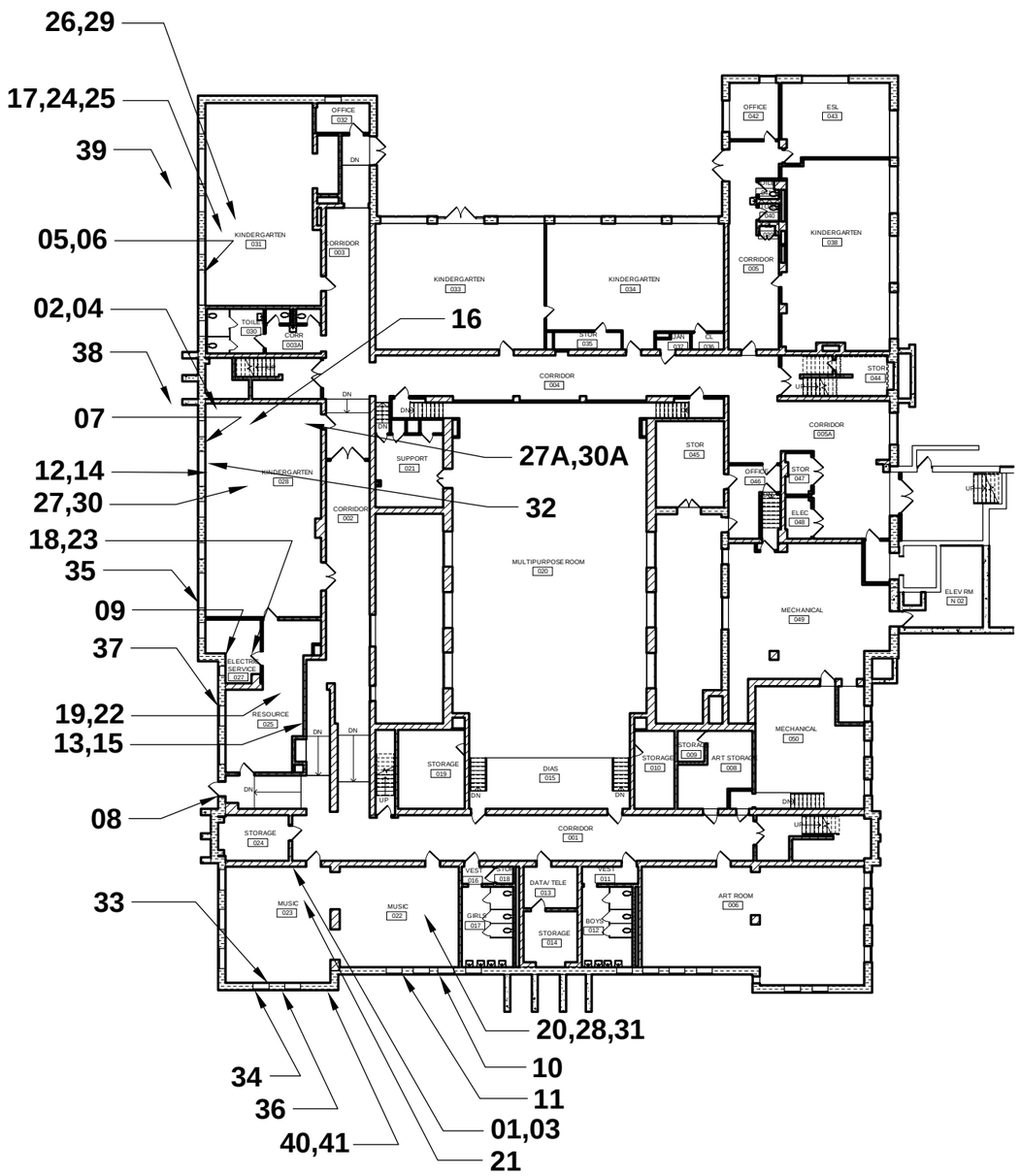
HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
13A	27a	Ground Floor, Room 028, adj 1 door entry	Ceiling Plaster, White Coat		
14A	30a	↓ ↓ ↓	↓ ↓ , Brown Coat		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
Stephen Gruber		9/14/22				/ /				/ /	
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
		9/14/22	15:07			/ /				/ /	

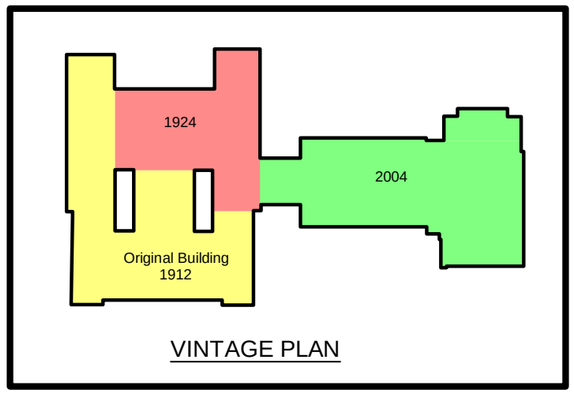
NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

APPENDIX C:
ASBESTOS BULK SAMPLE LOCATION DRAWINGS



GROUND FLOOR PLAN

SCALE: 3/32" = 1'-0"



VINTAGE PLAN

BEDFORD CENTRAL SCHOOL DISTRICT

Every Single Student, Every Single Day

BEDFORD
CENTRAL SCHOOL
DISTRICT

632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL: 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

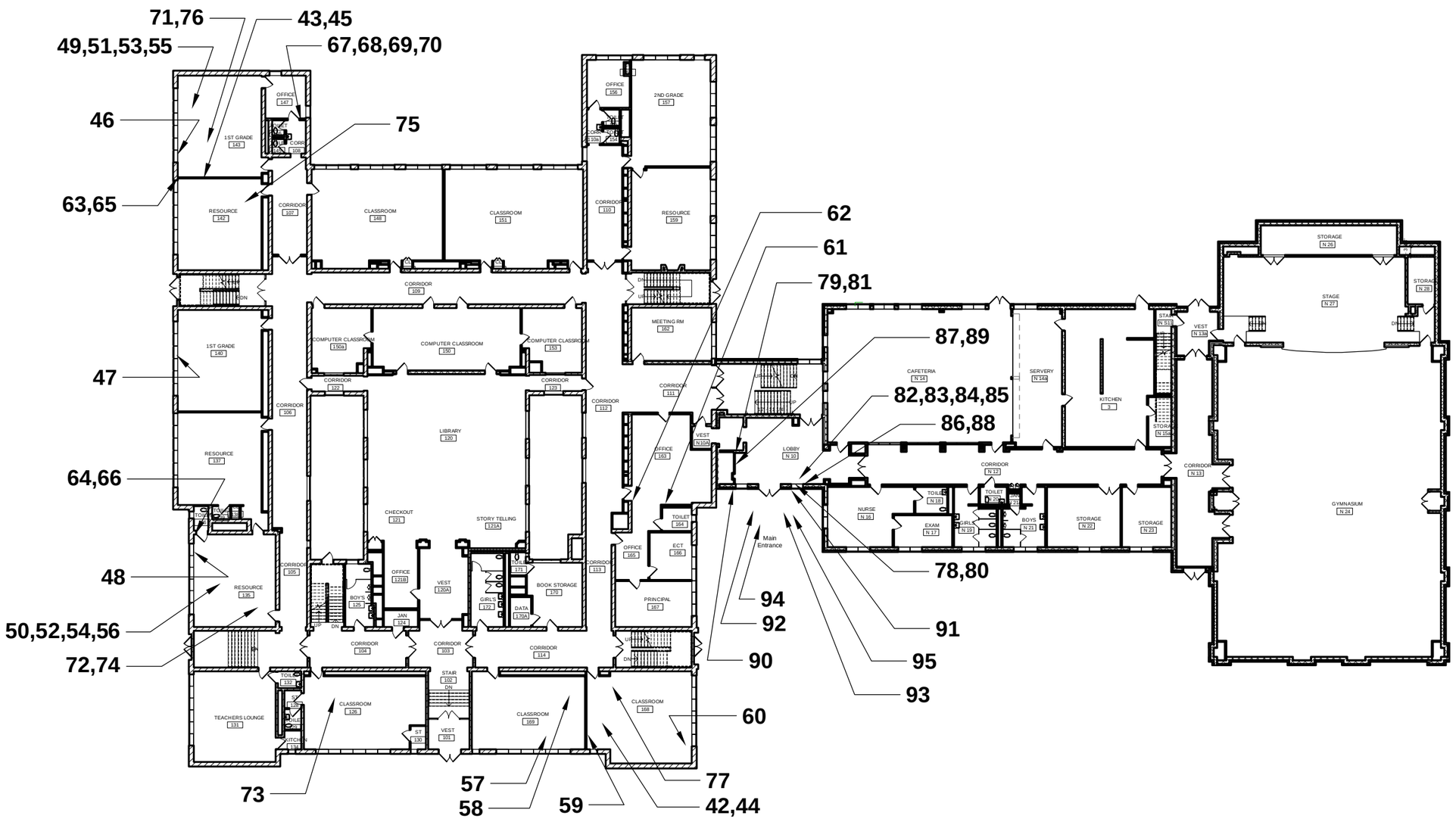
MOUNT KISCO ELEMENTARY
SCHOOL
SED SURVEY PROJECT
47 WEST HYATT AVENUE
MT. KISCO, NY 10549

DRAWING TITLE

BULK SAMPLE LOCATIONS
GROUND FLOOR PLAN

DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV. J.GARCIA	DATE: 09/20/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A.SMOLYAR	BSL001
	DRAWING NUMBER: 1 OF 3

CONSULTANTS PROJECT 31405320.013



FIRST FLOOR PLAN

SCALE: 3/32" = 1'-0"

BEDFORD CENTRAL SCHOOL DISTRICT
Every Single Student, Every Single Day

BEDFORD CENTRAL SCHOOL DISTRICT
632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL: 914.742.1120

KEY PLAN:

REVISIONS:

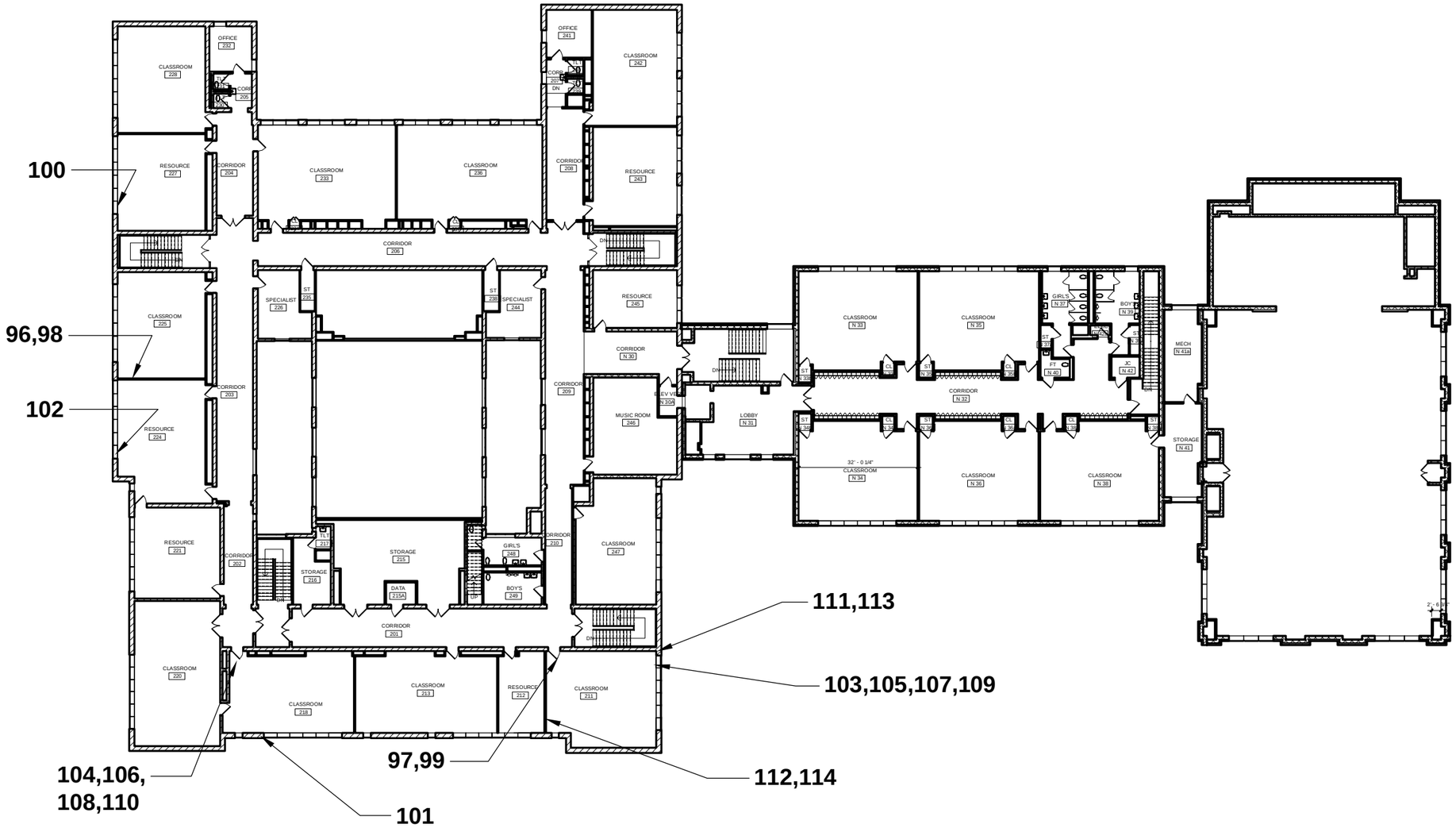
NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

MOUNT KISCO ELEMENTARY SCHOOL
SED SURVEY PROJECT
47 WEST HYATT AVENUE
MT. KISCO, NY 10549

DRAWING TITLE

BULK SAMPLE LOCATIONS
SECOND FLOOR PLAN

DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV. J. GARCIA	DATE: 09/20/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A.SMOLYAR	BSL002
	DRAWING NUMBER: 2 OF 3



SECOND FLOOR PLAN

SCALE: 3/32" = 1'-0"

BEDFORD CENTRAL SCHOOL DISTRICT
Every Single Student, Every Single Day

BEDFORD
CENTRAL SCHOOL
DISTRICT

632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL. 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

MOUNT KISCO ELEMENTARY
SCHOOL
SED SURVEY PROJECT
47 WEST HYATT AVENUE
MT. KISCO, NY 10549

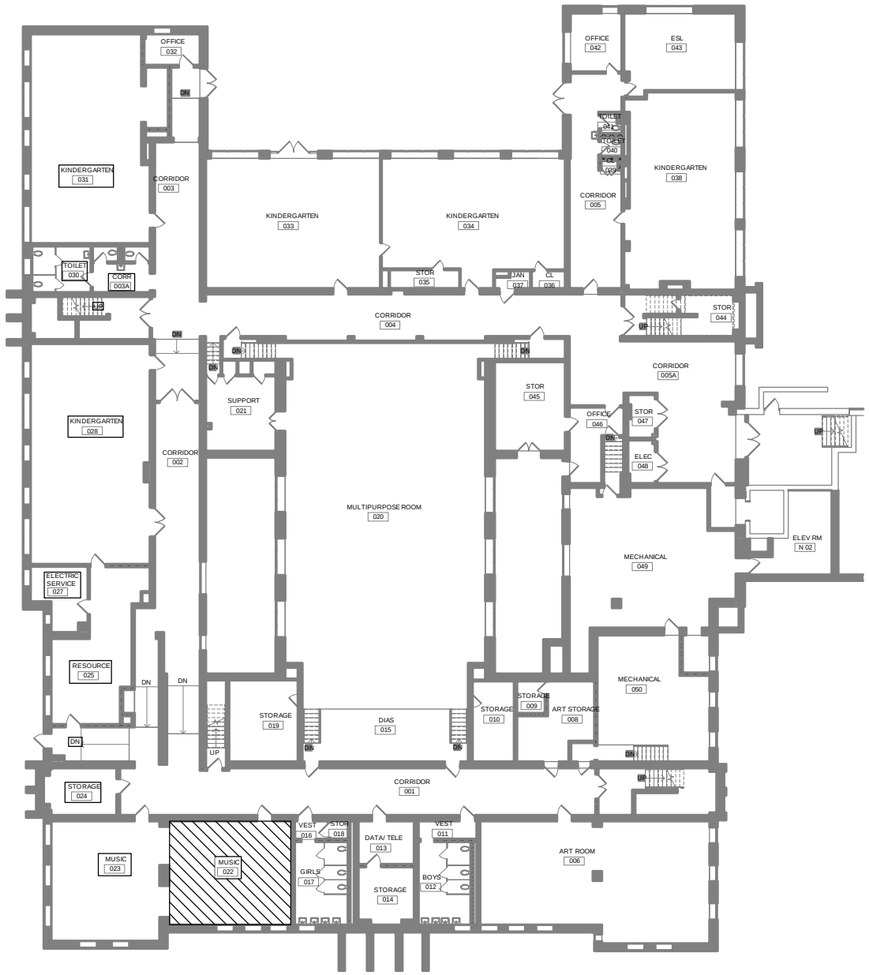
DRAWING TITLE

BULK SAMPLE LOCATIONS
SECOND FLOOR PLAN

DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV. J.GARCIA	DATE: 09/20/2022
CERTIFICATE NO. 01-04202	DRAWING NUMBER:
CHECKED BY: A. SMOLYAR	BSL003
	DRAWING NUMBER: 3 OF 3

CONSULTANTS PROJECT 31405320.013

APPENDIX D:
ASBESTOS CONTAINING MATERIALS LOCATION DRAWINGS

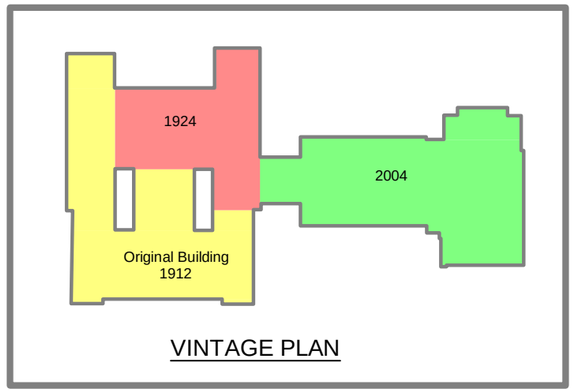


GROUND FLOOR PLAN

SCALE: 3/32" = 1'-0"

LEGEND

LOCATION OF ASBESTOS CONTAINING CEILING PLASTER (WHITE AND BROWN COATS).



VINTAGE PLAN

BEDFORD CENTRAL SCHOOL DISTRICT
Every Single Student, Every Single Day

BEDFORD CENTRAL SCHOOL DISTRICT

632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL: 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

MOUNT KISCO ELEMENTARY SCHOOL
SED SURVEY PROJECT
47 WEST HYATT AVENUE
MT. KISCO, NY 10549

DRAWING TITLE

ASBESTOS CONTAINING MATERIALS
GROUND FLOOR PLAN

DRAWN BY: J. PEREZ	SCALE: AS SHOWN
INSP./INV: J. GARCIA	DATE: 09/20/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A. SMOLYAR	ACM001
	DRAWING NUMBER: 1 OF 1

CONSULTANTS PROJECT 31405320.013

APPENDIX E:
LEAD XRF SHOT RESULTS

XRF CALIBRATION CHECK FORM

PAGE 1 OF ____

PROJ. NO.:		DATE:	8/26/22
PROJECT NAME:	Mt. Kisco ES	INSPECTOR NAME:	DK; JG; JW
CLIENT:		INSPECTOR SIGNATURE:	
SITE:		PROJ. MANAGER:	

250 W 34th Street -4th Floor, New York, NY
Tel 212 612 7900 Fax 212 363 4341

XRF MAKE/MODEL: RMD LPA-1; PB200i-#2150

XRF JOB # 0825095 6

NOTES:

CALIBRATION CHECK – FIELD-END/2-HR/4-HR (circle one)

1.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 9:30	TEST #	01	02	03	0.7
	XRF READING	0.7	0.7	0.7	

CALIBRATION CHECK – FIELD-END/2-HR/4-HR (circle one)

0.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 9:33	TEST #	04	05	06	0.0
	XRF READING	0.0	0.0	0.0	

CALIBRATION CHECK – FIELD-END/2-HR/4-HR (circle one)

1.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 1245	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR/4-HR (circle one)

____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ____	TEST #	25	26	27	
	XRF READING	0.8	0.7	0.7	

CALIBRATION CHECK – FIELD-END/2-HR/4-HR (circle one)

____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ____	TEST #	28	29	30	
	XRF READING	-0.1	-0.1	-0.1	

CALIBRATION CHECK – FIELD-END/2-HR/4-HR (circle one)

____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ____	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR/4-HR (circle one)

____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ____	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR/4-HR (circle one)

____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ____	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR/4-HR (circle one)

____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ____	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR/4-HR (circle one)

____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ____	TEST #				
	XRF READING				

XRF LEAD-BASED PAINT TESTING DATA SHEET/CHAIN OF CUSTODY

PAGE 1 OF ___

XRF SERIAL #:

PROJECT NO.: _____

CLIENT: _____

INSPECTOR(S): _____

PROJ. MANAGER:

PROJECT NAME:

PROJECT LOCATION: _____

INSPECTION DATE:

SPACE CHARACTERISTICS:

FLOOR #: _____ ROOM #: _____ ROOM NAME: _____

NOTES:

SAMPLE #	SUBSTRATE	COMPONENT DISCRIPTION: COLOR	CONDITION [I / F / P]	COMPONENT	WALL/SIDE DESIGN.	SIDE [L/C/R]	HEIGHT [L/M/U]	COMPONENT REPLICANT	QUANTITY (IF POSITIVE) [SF]	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	XRF READING [mg/cm²]
07	M PL S C CB PG CR B W V CT (G) FG OTHER:	white		W	A B (C) D RM CTR FL CL			Rm	022			0.4
08	M PL S C CB PG CR B W V (CT) G FG OTHER:	white		W	A B (C) D RM CTR FL CL			Rm	022			0.6
09	(M) PL S C CB PG CR B W V CT G FG OTHER:	white		WF	A B (C) D RM CTR FL CL			Rm	022			0.4
10	M PL S C CB (PG) CR B W V CT G FG OTHER:	white		W	A B (C) D RM CTR FL CL			Rm	022			0.2
11	M PL S C (CB) PG CR B W V CT G FG OTHER:	white		W	(A) B C D RM CTR FL CL		Corridor	Ext	Rm	025		0.3
12	M PL S C CB PG CR B (W) V CT G FG OTHER:	white		W. Sill	A B (C) D RM CTR FL CL			Rm	028			5.0
13	(M) PL S C CB PG CR B W V CT G FG OTHER:	beige		RC	A B (C) D RM CTR FL CL			Rm	028			0.1
14	M (PL) S C CB PG CR B (W) V CT G FG OTHER:	white		W	A B C D RM CTR FL CL			Rm	031			0.5
15	(M) PL S C CB PG CR B W V CT G FG OTHER:	white		EC	A B (C) D RM CTR FL CL			Rm	031			<0.1
16	M (PL) S C CB PG CR B W V CT G FG OTHER:	white		CL	A B C D RM CTR FL CL			Rm	031			1.9
17	M (PL) S C CB PG CR B (W) V CT G FG OTHER:	beige		W	A B (C) D RM CTR FL CL			Rm	143			0.5
18	M PL S C CB PG CR B W V CT (G) FG OTHER:	Beige		W	A (B) C D RM CTR FL CL			Rm	143			0.1
19	(M) PL S C CB PG CR B (W) V CT G FG OTHER:	beige		BB	A B C D RM CTR FL CL			Rm	143			<0.1
20	M (PL) S C CB PG CR B W V CT G FG OTHER:	beige		W	A B (C) D RM CTR FL CL			Rm	131			7.1
21	M PL S C CB PG CR B (W) V CT G FG OTHER:	beige		BB	A B C D RM CTR FL CL			Rm	131			0.0
22	M (PL) S C CB PG CR B W V CT G FG OTHER:	beige		W	A B (C) D RM CTR FL CL			Rm	221			19.1
23	M PL S C CB PG CR B (W) V CT G FG OTHER:	beige		BB	A B (C) D RM CTR FL CL			Rm	221			0.0
24	M PL S C CB PG CR B W V CT (G) FG OTHER:	beige		W	A B C D RM CTR FL CL			Rm	227			0.2
25	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							

Side: Left/Center/Right; Height: Lower/Middle/Upper; Substrate: M: Metal; PL: Plaster; S: Sheetrock; C: Concrete; CB: Cinder Block; CR: Sinks, Water Closets, etc.; CT: Ceramic Tile; PG: Porcelain-glazed Block; B: Brick; W: Wood; V: Vinyl; FG: Fiberglass; G: Glass ; Condition: I = Intact; F = Fair; P = Poor; Initial Result: P = Positive; N = Negative;

APPENDIX F:
PCB BULK SAMPLE FIELD DATA SHEETS WITH CHAIN OF CUSTODY & LABORATORY RESULTS

Technical Report

prepared for:

WSP USA (New York, NY)
One Penn Plaza, 2nd Floor
New York NY, 10119
Attention: Alexander Smolyar

Report Date: 09/06/2022
Client Project ID: 31405320.013 Mount Kisco ES, 47 West Hyatt Ave, NY
York Project (SDG) No.: 22H1650

CT Cert. No. PH-0723 New Jersey Cert. No. CT005 and NY037 New York Cert. Nos. 10854 and 12058 PA Cert. No. 68-04440

120 RESEARCH DRIVE STRATFORD, CT 06615 ■ 132-02 89th AVENUE RICHMOND HILL, NY 11418
www.YORKLAB.com (203) 325-1371 FAX (203) 357-0166 ClientServices@yorklab.com

Report Date: 09/06/2022
Client Project ID: 31405320.013 Mount Kisco ES, 47 West Hyatt Ave, NY
York Project (SDG) No.: 22H1650

WSP USA (New York, NY)
One Penn Plaza, 2nd Floor
New York NY, 10119
Attention: Alexander Smolyar

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on August 29, 2022 and listed below. The project was identified as your project: **31405320.013 Mount Kisco ES, 47 West Hyatt Ave, NY**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Sample and Analysis Qualifiers section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the Sample and Data Qualifiers Relating to This Work Order section of this report and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
22H1650-01	01-01/02/03	Caulk	08/26/2022	08/29/2022
22H1650-02	02-04/05/06	Caulk	08/26/2022	08/29/2022
22H1650-03	03-07/08/09	Caulk	08/26/2022	08/29/2022
22H1650-04	04-10/11/12	Caulk	08/26/2022	08/29/2022

General Notes for York Project (SDG) No.: 22H1650

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All analyses conducted met method or Laboratory SOP requirements. See the Sample and Data Qualifiers Section for further information.
6. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
7. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.
8. Analyses conducted at York Analytical Laboratories, Inc. Stratford, CT are indicated by NY Cert. No. 10854; those conducted at York Analytical Laboratories, Inc., Richmond Hill, NY are indicated by NY Cert. No. 12058.

Approved By:  **Date:** 09/06/2022

Cassie L. Mosher
Laboratory Manager

Sample Information

Client Sample ID: 01-01/02/03 **York Sample ID:** 22H1650-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1650	31405320.013 Mount Kisco ES, 47 West Hyatt Ave, NY	Caulk	August 26, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB) **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.368	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:03	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.368	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:03	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.368	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:03	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.368	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:03	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.368	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:03	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.368	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:03	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.368	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:03	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.368	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,NJDEP	09/05/2022 19:03	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.368	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,NJDEP	09/05/2022 19:03	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.368	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 19:03	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*92.0 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*104 %*	*30-140*

Sample Information

Client Sample ID: 02-04/05/06 **York Sample ID:** 22H1650-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1650	31405320.013 Mount Kisco ES, 47 West Hyatt Ave, NY	Caulk	August 26, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB) **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.352	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:16	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.352	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:16	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.352	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:16	BJ

Sample Information

Client Sample ID: 02-04/05/06 **York Sample ID:** 22H1650-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1650	31405320.013 Mount Kisco ES, 47 West Hyatt Ave, NY	Caulk	August 26, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
53469-21-9	Aroclor 1242	ND		mg/kg	0.352	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:16	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.352	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:16	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.352	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:16	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.352	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:16	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.352	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,NJDEP	09/05/2022 19:16	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.352	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,NJDEP	09/05/2022 19:16	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.352	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 19:16	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*99.0 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*108 %*	*30-140*

Sample Information

Client Sample ID: 03-07/08/09 **York Sample ID:** 22H1650-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1650	31405320.013 Mount Kisco ES, 47 West Hyatt Ave, NY	Caulk	August 26, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:30	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:30	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:30	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:30	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:30	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:30	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:30	BJ

Sample Information

Client Sample ID: 03-07/08/09 **York Sample ID:** 22H1650-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1650	31405320.013 Mount Kisco ES, 47 West Hyatt Ave, NY	Caulk	August 26, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
37324-23-5	Aroclor 1262	ND		mg/kg	0.403	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 19:30	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.403	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 19:30	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.403	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 19:30	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*80.5 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*78.0 %*	*30-140*

Sample Information

Client Sample ID: 04-10/11/12 **York Sample ID:** 22H1650-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1650	31405320.013 Mount Kisco ES, 47 West Hyatt Ave, NY	Caulk	August 26, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.431	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 19:43	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.431	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 19:43	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.431	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 19:43	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.431	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 19:43	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.431	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 19:43	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.431	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 19:43	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.431	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 19:43	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.431	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 19:43	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.431	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 19:43	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.431	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 19:43	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*95.0 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*104 %*	*30-140*

Sample Information

Client Sample ID: **04-10/11/12** **York Sample ID:** **22H1650-04**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1650	31405320.013 Mount Kisco ES, 47 West Hyatt Ave, NY	Caulk	August 26, 2022 3:00 pm	08/29/2022

Analytical Batch Summary

Batch ID: BI20099 **Preparation Method:** EPA 3550C **Prepared By:** KEO

YORK Sample ID	Client Sample ID	Preparation Date
22H1650-01	01-01/02/03	09/02/22
22H1650-02	02-04/05/06	09/02/22
22H1650-03	03-07/08/09	09/02/22
22H1650-04	04-10/11/12	09/02/22
BI20099-BLK1	Blank	09/02/22
BI20099-BS1	LCS	09/02/22
BI20099-BSD1	LCS Dup	09/02/22

Polychlorinated Biphenyls by GC/ECD - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BI20099 - EPA 3550C											
Blank (BI20099-BLK1)								Prepared: 09/02/2022 Analyzed: 09/05/2022			
Aroclor 1016	ND	0.455	mg/kg								
Aroclor 1221	ND	0.455	"								
Aroclor 1232	ND	0.455	"								
Aroclor 1242	ND	0.455	"								
Aroclor 1248	ND	0.455	"								
Aroclor 1254	ND	0.455	"								
Aroclor 1260	ND	0.455	"								
Aroclor 1262	ND	0.455	"								
Aroclor 1268	ND	0.455	"								
Total PCBs	ND	0.455	"								
Surrogate: Tetrachloro-m-xylene	*1.65*		*"*	*1.82*		*90.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*1.69*		*"*	*1.82*		*93.0*	*30-140*				
LCS (BI20099-BS1)								Prepared: 09/02/2022 Analyzed: 09/05/2022			
Aroclor 1016	7.97	0.455	mg/kg	9.09		87.6	40-130				
Aroclor 1260	8.40	0.455	"	9.09		92.4	40-130				
Surrogate: Tetrachloro-m-xylene	*1.75*		*"*	*1.82*		*96.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*1.93*		*"*	*1.82*		*106*	*30-140*				
LCS Dup (BI20099-BSD1)								Prepared: 09/02/2022 Analyzed: 09/05/2022			
Aroclor 1016	7.12	0.455	mg/kg	9.09		78.3	40-130		11.2	25	
Aroclor 1260	7.37	0.455	"	9.09		81.1	40-130		13.1	25	
Surrogate: Tetrachloro-m-xylene	*1.54*		*"*	*1.82*		*84.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*1.58*		*"*	*1.82*		*87.0*	*30-140*				
Batch Y2I0605 - BI20097											
Aroclor Reference (Y2I0605-ARC1)								Prepared & Analyzed: 09/05/2022			
Surrogate: Tetrachloro-m-xylene	*0.211*		*ug/mL*	*0.200*		*106*					
Surrogate: Decachlorobiphenyl	*0.210*		*"*	*0.200*		*105*					

Sample and Data Qualifiers Relating to This Work Order

Definitions and Other Explanations

*	Analyte is not certified or the state of the samples origination does not offer certification for the Analyte.
ND	NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
LOQ	LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence. This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon NELAC 2009 Standards and applies to all analyses.
LOD	LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.
MDL	METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.
Reported to	This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two. For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the LOD/MDL, with values between the LOD/MDL and the LOQ being "J" flagged as estimated results.

For analyses by EPA SW-846-8270D, the Limit of Quantitation (LOQ) reported for benzidine is based upon the lowest standard used for calibration and is not a verified LOQ due to this compound's propensity for oxidative losses during extraction/concentration procedures and non-reproducible chromatographic performance.

22141650

PCB SURVEY DATA SHEET/ CHAIN OF CUSTODY

WSP PROJ #: 31405320.013
CLIENT: Bedford Central School District
Project Site: Mount Kisco ES, 47 West Hyatt Ave., Mt Kisco, NY 10549
Project Manager: Alex Smolyar

LOCATION(S) SURVEYED: Ground, 1st and 2nd Floors
PROPOSED PROJECT : SED Survey
DATE(S) OF INSPECTION: 08/26/2022
Inspector(s) Josue Garcia & Dmitri Kirnossenko

WSP
TELEPHONE NO. : (212) 612-7900 **FAX NO.: (212) 363-4341**
ADDRESS: 96 Morton Street, 8 Floor, New York, NY 10014

RESULTS TO:

TURNAROUND TIME:
☐48 HR ☐72 H R ☐96 HR X 120 HR

LAB SAMPLE NO.	HA	SAMPLE NO.	MATERIAL DESCRIPTION	SAMPLE LOCATION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
	01	01	Interior Window Frame	Ground Floor RM 23		1912 Buildings
		02	Caulking, White	↓ ↓		
		03	↓	↓ RM 23		
	02	04	Exterior Window Frame	Ground Floor Southwest		1912 Building
		05	Caulking, white	↓ West		
		06	↓	↓ ↓		
	03	07	Exterior Column Caulking,	First Floor Main Entrance		2004 Buildings
		08	↓ Lunite	↓ ↓		
		09	↓	↓ ↓		
	04	10	Exterior Floor Expansion Joint	First Floor Main Entrance		2004 Buildings
		11	Caulking, Gray	↓ ↓		
		12	↓	↓ ↓		

CHAIN OF CUSTODY

Relinquished by:	(Sign)			Relinquished by: (print)	(Sign)			Relinquished by: (print)	(Sign)		
J. Garcia		8/29/22	AM/PM			8/29/22	1531 AM/PM	I. B		8/29/22	1846 AM/PM
Received by:	(Sign)			Received by: (print)	(Sign)			Received by: (print)	(Sign)		
		8/29/22	AM/PM	I. B		/ /	AM/PM			8/29/22	1846 AM/PM

23.2i

LAB INSTRUCTIONS: create one (1) composite sample of each homogeneous material from equal mass portions (± 5%) of the three (3) sub-samples for extraction and analysis via EPA Method 8082 and report the Arochlors listed (Arochlor 1016, Arochlor 1221, Arochlor 1232, Arochlor 1242, Arochlor 1248, Arochlor 1254, Arochlor 1260). The laboratory shall target a PCB detection limit of 1 ppm

APPENDIX G:
COMPANY LICENSE, PERSONAL CERTIFICATIONS AND LABORATORY ACCREDITATIONS

New York State – Department of Labor
Division of Safety and Health
License and Certificate Unit
State Campus, Building 12
Albany, NY 12240

ASBESTOS HANDLING LICENSE

WSP USA Solutions Inc.
4th Floor
One Penn Plaza

New York, NY 10119

FILE NUMBER: 19-132876
LICENSE NUMBER: 132876
LICENSE CLASS: RESTRICTED
DATE OF ISSUE: 03/31/2022
EXPIRATION DATE: 03/31/2023

Duly Authorized Representative – Craig Napolitano:

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Amy Phillips, Director
For the Commissioner of Labor

SH 432 (8/12)

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2023
Issued April 01, 2022

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MS. JACKIE DARVISH
ATLAS ENVIRONMENTAL LABS CORP
255 W 36TH STREET SUITE 1503
NEW YORK, NY 10018

NY Lab Id No: 11999

is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:

Miscellaneous

Asbestos in Friable Material	Item 198.1 of Manual
	EPA 600/M4/82/020
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)
Asbestos in Non-Friable Material-TEM	Item 198.4 of Manual
Asbestos-Vermiculite-Containing Material	Item 198.8 of Manual
Lead in Dust Wipes	EPA 7000B
Lead in Paint	EPA 7000B

Sample Preparation Methods

EPA 3050B

Serial No.: 64911

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Atlas Environmental Lab (Asbestos in Bulk)
255 W 36th Street Suite #1503
New York, NY 10018
Ms. Jackie Darvish
Phone: 212-563-0400 Fax: 212-563-0401
Email: jdarvish@atlasenvironmentallab.com
http://www.atlasenvironmentallab.com

ASBESTOS FIBER ANALYSIS — NVLAP LAB CODE 500092-0

Bulk Asbestos Analysis

Code	*Description*
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

Code	*Description*
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

For the National Voluntary Laboratory Accreditation Program

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 500092-0

Atlas Environmental Lab (Asbestos in Bulk)

New York, NY

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2021-10-01 through 2022-09-30

Effective Dates

For the National Voluntary Laboratory Accreditation Program

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

Atlas Environmental Lab

255 W 36th Street, Suite 1503, New York, NY 10018

Laboratory ID: LAP-208306

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA LAP), LLC accreditation to the ISO/IEC 17025:2017 international standard, General Requirements for the Competence of Testing and Calibration Laboratories in the following:

LABORATORY ACCREDITATION PROGRAMS

☑	**INDUSTRIAL HYGIENE**	Accreditation Expires: August 01, 2023
☑	**ENVIRONMENTAL LEAD**	Accreditation Expires: August 01, 2023
☑	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires: August 01, 2023
☐	**FOOD**	Accreditation Expires:
☐	**UNIQUE SCOPES**	Accreditation Expires:

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached Scope of Accreditation. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2017 and AIHA LAP, LLC requirements. This certificate is not valid without the attached Scope of Accreditation. Please review the AIHA LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

Cheryl O. Morton

Cheryl O Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision19.1: 07/28/2021

Date Issued: 07/28/2021

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2023
Issued April 01, 2022

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. ROBERT Q. BRADLEY
YORK ANALYTICAL LABORATORIES INC
120 RESEARCH DRIVE
STRATFORD, CT 06615

NY Lab Id No: 10854

is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards (2016) for the category ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved analytes are listed below:

Polychlorinated Biphenyls

Aroclor 1016 (PCB-1016)	EPA 8082A
Aroclor 1016 (PCB-1016) in Oil	EPA 8082A
Aroclor 1221 (PCB-1221)	EPA 8082A
Aroclor 1221 (PCB-1221) in Oil	EPA 8082A
Aroclor 1232 (PCB-1232)	EPA 8082A
Aroclor 1232 (PCB-1232) in Oil	EPA 8082A
Aroclor 1242 (PCB-1242)	EPA 8082A
Aroclor 1242 (PCB-1242) in Oil	EPA 8082A
Aroclor 1248 (PCB-1248)	EPA 8082A
Aroclor 1248 (PCB-1248) in Oil	EPA 8082A
Aroclor 1254 (PCB-1254)	EPA 8082A
Aroclor 1254 (PCB-1254) in Oil	EPA 8082A
Aroclor 1260 (PCB-1260)	EPA 8082A
Aroclor 1260 (PCB-1260) in Oil	EPA 8082A
Aroclor 1262 (PCB-1262)	EPA 8082A
Aroclor 1262 (PCB-1262) in Oil	EPA 8082A
Aroclor 1268 (PCB-1268)	EPA 8082A
Aroclor 1268 (PCB-1268) in Oil	EPA 8082A

Polynuclear Aromatic Hydrocarbons

Acenaphthene	EPA 8270D
	EPA 8270E
Acenaphthylene	EPA 8270D

Serial No.: 65074

01213 005960614 55

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NEW YORK NY 10014

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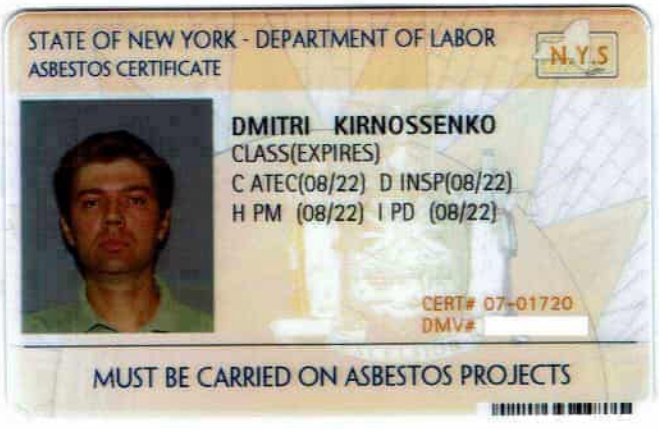


United States Environmental Protection Agency

This is to certify that

Dmitri Kirnossenko

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Inspector

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires October 01, 2023

LBP-I-16279-2

Certification #

June 19, 2020

Issued On

Ben Conetta, Chief

Chemicals and Multimedia Programs Branch

STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE

N.Y.S.

JOSUE GARCIA
CLASS(EXPIRES)
C ATEC(08/22) D INSP(08/22)
H PM (08/22) I PD (08/22)

CERT# 01-04282
DMV# 815004194

MUST BE CARRIED ON ASBESTOS PROJECTS

United States Environmental Protection Agency

This is to certify that

Josue Garcia

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Risk Assessor

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires April 09, 2023

LBP-R-6928-2
Certification #

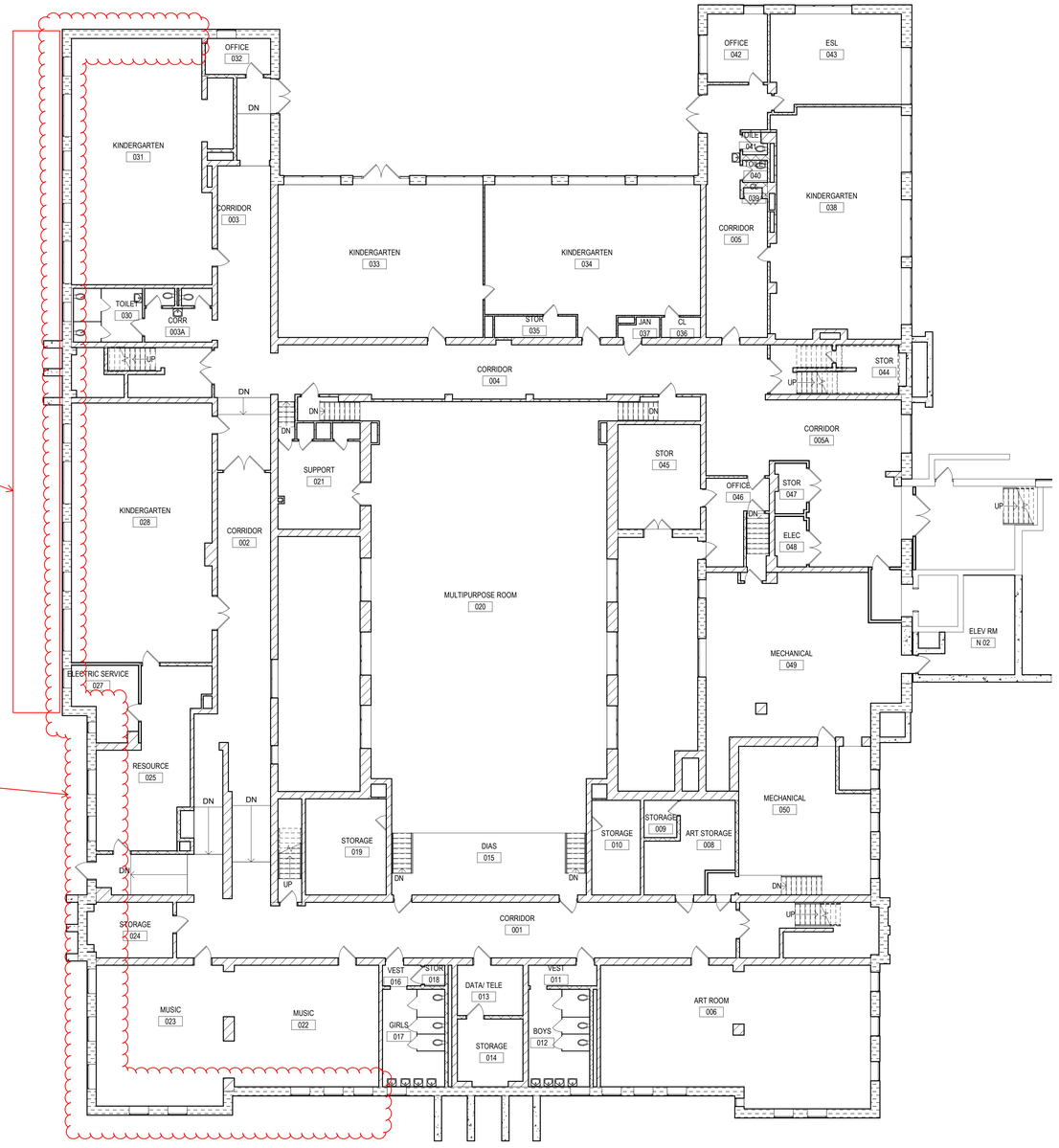
January 28, 2020
Issued On

Susan Schulz, Acting Chief
Chemicals and Multimedia Programs Branch

APPENDIX H:
SCOPE OF WORK DRAWINGS

Item 1.20
New window wells. Test suspected exterior materials

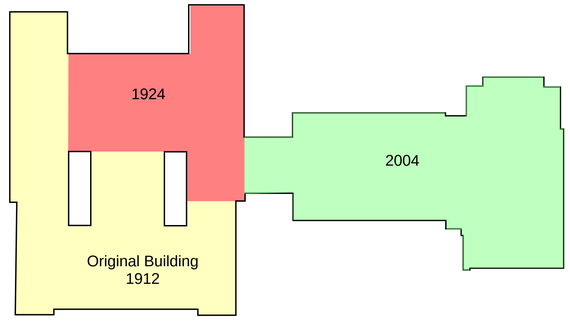
Item 1.17
Test suspected interior wall, ceiling materials/paint



GROUND FLOOR
SCALE: 3/32" = 1'-0"

Mount Kisco ES Phase 1 Projects - Scope of Work

1.17	Mount Kisco Elementary School	MKES A-2	Due to the fact that lower floor is below grade - in some areas exterior wall need repairs/refinishing due to water infiltration
1.18	Mount Kisco Elementary School	MKES A-6	Floor replacement in multiple classrooms and offices located in the original building
1.19	Mount Kisco Elementary School	MKES A-10	Rearrange existing security vestibule for better function security vestibule
1.20	Mount Kisco Elementary School	MKES A-16	Reconstruct area window wells at west side first floor windows
1.21	Mount Kisco Elementary School	MKES A-25	Provide glass vestibule below existing entry canopy
1.22	Mount Kisco Elementary School	MKES E-3	Add telephone handsets to classrooms to improve communications and enhance safety during emergency situations

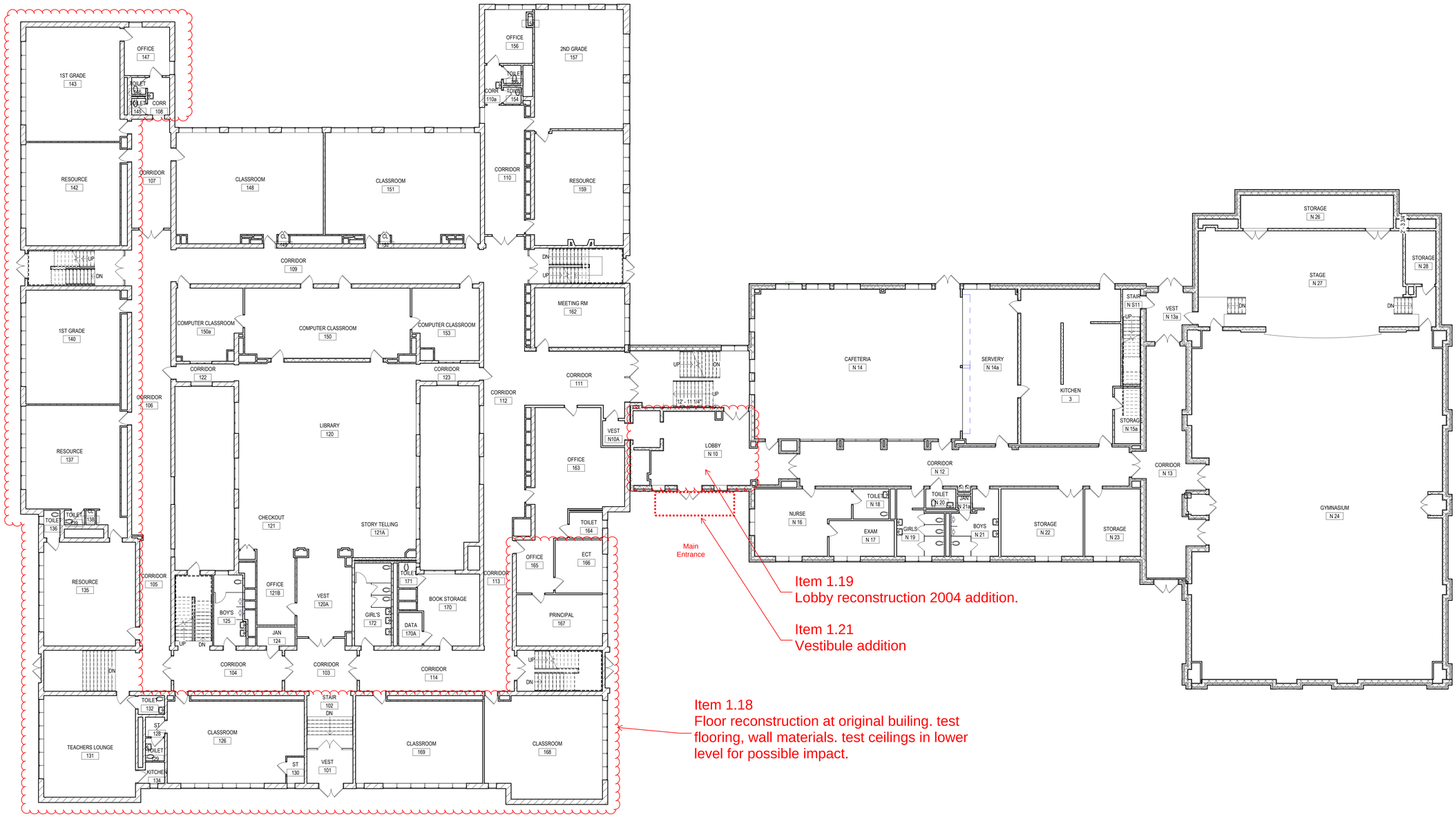


Vintage Plan

OVERALL GROUND FLOOR
MOUNT KISCO ELEMENTARY SCHOOL
BEDFORD CENTRAL SCHOOL DISTRICT

04/06/21

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS



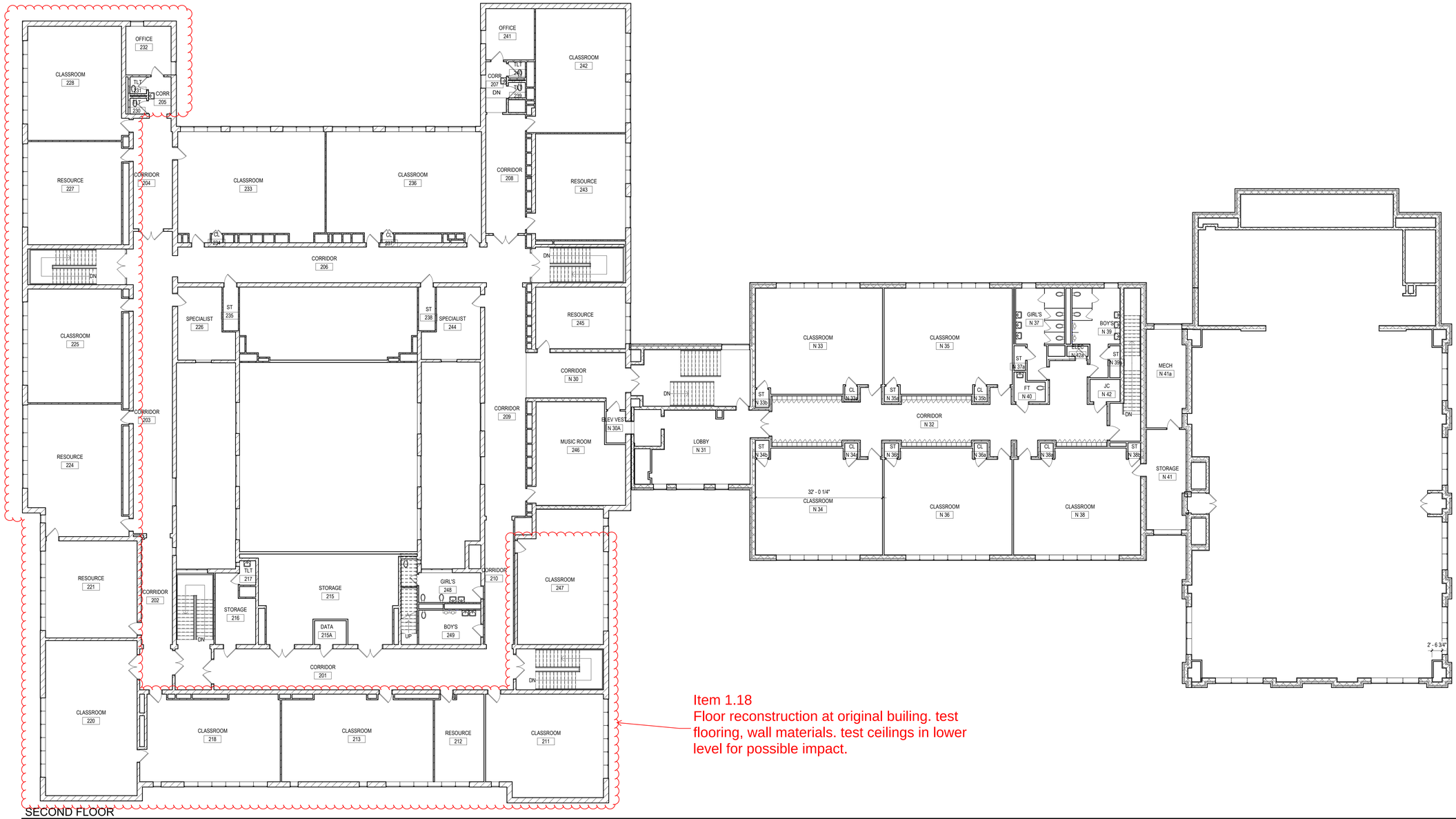
FIRST FLOOR

SCALE: 3/32" = 1'-0"

OVERALL FIRST FLOOR
MOUNT KISCO ELEMENTARY SCHOOL
BEDFORD CENTRAL SCHOOL DISTRICT

04/06/21

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS



Item 1.18
Floor reconstruction at original builing. test flooring, wall materials. test ceilings in lower level for possible impact.

SECOND FLOOR
SCALE: 3/32" = 1'-0"

OVERALL SECOND FLOOR
MOUNT KISCO ELEMENTARY SCHOOL
BEDFORD CENTRAL SCHOOL DISTRICT

04/06/21

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS

APPENDIX I:
FILE SEARCH

ASBESTOS TRIENNIAL INSPECTION REPORT

for

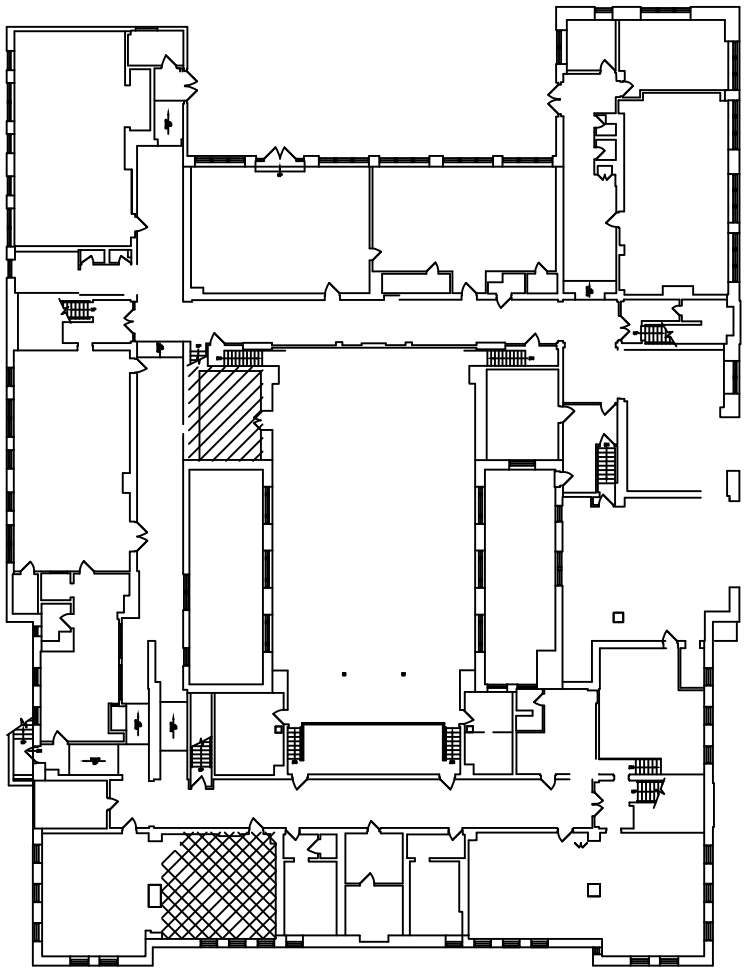
MOUNT KISCO ELEMENTARY SCHOOL

BEDFORD CENTRAL SCHOOL DISTRICT
Fox Lane Campus
Mount Kisco, New York 10528

by

S & B ENVIRONMENTAL, LLC
7 Fairchild Road
Newtown, CT. 06470

12 May 2019



Mount Kisco Elementary School
Basement

Location of asbestos containing floor tiles and mastic. These tiles are located on the upper level of this section (the office above the store room shown).

Location of asbesots containing plaster ceiling.

FINAL REPORT OF ENVIRONMENTAL SERVICES

Performed at:

BEDFORD HILLS ELEMENTARY SCHOOL
SED SURVEY PROJECT
123 BABBITT ROAD
BEDFORD HILLS, NY 10507

Prepared for:

BEDFORD CENTRAL SCHOOL DISTRICT

Inspiring and Challenging Our Students

632 South Bedford Road
Bedford, NY 10506

Prepared by:

WSP USA Solutions, Inc.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
Tel. (914) 747-1120

Project No. 31405320.009
Final Submission Date: September 26, 2022

September 26, 2022

Mr. Dennis Rankin
Director of Facilities
Bedford Central School District
632 South Bedford Road
Bedford, NY 10506

Subject: **Final Report of Environmental Services**
SED Survey Project
Bedford Hills Elementary School
123 Babbitt Road
Bedford Hills, NY 10507

Dear Mr. Rankin:

WSP USA Solutions, Inc. has completed a material inspection at the Bedford Hills Elementary School located at 123 Babbitt Road, Bedford Hills, NY 10507. The inspection included visual observation, material sampling, and laboratory sample analysis of suspect Asbestos-Containing Materials (ACM), Lead Based Paints (LBP) and Polychlorinated Biphenyls (PCBs) as part of the SED Survey project at the Bedford Hills Elementary School.

The attached report presents descriptions and results of the material sampling procedures and visual analysis. Relevant general project information is provided, followed by our findings, assessments and recommendations. Laboratory analysis data and certifications are provided in the Appendices.

If you have any questions concerning this report or if we may be of further assistance to you, please contact us.

Sincerely,

WSP USA SOLUTIONS, INC.

Steven Eget, PE
Vice President, Earth & Environment Downstate NY Business Line Leader

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Appendices

1.0 EXECUTIVE SUMMARY

WSP USA Solutions, Inc. has performed a material inspection for the presence or absence of Asbestos-Containing Materials (ACM), Lead Based Paints (LBP) and Polychlorinated Biphenyls (PCBs) at the Bedford Hills Elementary School located at 123 Babbitt Road, Bedford Hills, NY 10507. The intent of this inspection was to screen for ACM, LBP and PCBs that may be impacted during the SED Survey project at the school noted above.

Jordan Wong and Josue Garcia of WSP performed this inspection on August 30, 2022. Mr. Wong is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert#09-09397) and a licensed New York State EPA as a Lead Risk Assessor (Cert# LBP-R-I183144-2). Mr. Garcia is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert#01-04292) and a licensed New York State EPA as a Lead Risk Assessor (Cert# LBP-R-6928-2).

The results of the visual inspection and bulk sample analysis determined that the following suspect ACM, LBP and PCB materials may be impacted by the proposed SED Survey project at the school noted above:

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 08/30/2022 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **Aircell Pipe and Pipe Fitting Insulation - (Basement Wood Shop)**

The following materials **Contain Asbestos as per AHERA Report:**

- **Floor Tiles and Mastic (Ground Floor, Office above Storage Room) - Not Affected by Current SOW**

Analytical results of the bulk samples collected on 08/30/2022 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Interior Stone Wall Mortar (Gray) - (Basement)
- Interior Limestone Mortar (Gray) - (Basement)
- Interior Brick Mortar (Gray) - (Basement)
- Fiberglass Pipe Insulation Wrap (White) - (Basement)
- Pipe Fitting to Fiberglass Pipe Insulation (Gray) - (Basement)
- Cinderblock Wall Mortar (Gray) - (Basement)
- Interior Textured Paint (Green) - (Basement)
- Gypsum Board (White) - (First Floor)
- Joint Compound (White) - (First Floor)
- Interior Brick Mortar (Gray) - (First Floor)
- Mastic Associated with 12”x12” Terrazzo Floor Tile (Beige/Gray) - (First Floor)
- 12”x12” Terrazzo Floor Tile (Red) - (First Floor)

- 12”x12” Terrazzo Floor Tile (Brown) - (First Floor)
- Single Coat Wall Plaster (Gray) - (First Floor)
- 2’x2’ Fissured Ceiling Tile (White) - (First Floor)
- Exterior Stone Wall Mortar (Gray) - (First Floor)
- Exterior Stairs / Pavers Mortar (Gray) - (First Floor)
- Exterior Door Frame Caulking (White) - (First Floor)
- Exterior Textured Paint on Wood (White) - (First Floor)
- Exterior Window Frame Caulking (White) - (First Floor)

B. LEAD-BASED PAINT

Based upon XRF readings, lead has been confirmed to exist in the following tested combinations:

- **Green Paint on Stone Wall (Basement, Woodshop)**
- **White Paint on Brick Wall (Basement, Stair Vestibule 1)**
- **Green Paint on Metal Stair Newel Post (Basement, Stair Vestibule 1)**
- **Green Paint on Metal Stair Stringer (Basement, Stair Vestibule 1)**
- **Gray Paint on Wood Door (Basement, Storage)**
- **Gray Paint on Wood Door Frame (Basement, Storage)**
- **Yellow Paint on Gypsum Wall (First Floor, Staff Toilet 105)**
- **White Paint on Wood Exterior Door Frame (First Floor, Main Entrance)**

Lead was **not detected** in the following tested combinations via XRF readings:

- Green Paint on Concrete Ceiling (Basement, Woodshop)
- Blue Paint on Metal Door (Basement, Woodshop)
- Beige Paint on Metal Door Frame (Basement, Woodshop)
- Green Paint on Metal Ceiling Radiator (Basement, Woodshop)
- Green Paint on Metal Pipe (Basement, Woodshop)
- Green Paint on Concrete Floor (Basement, Stair Vestibule 1)
- Dark Blue Paint on Metal Chair Lift (Basement, Stair Vestibule 2)
- Black Paint on Wood Door (First Floor, Entry Vestibule)
- Wood Paint on Wood Stain Door Frame (First Floor, Entry Vestibule)
- Wood Paint on Wood Stain Door (First Floor, Entry Vestibule)
- Dark Blue Paint on Metal Chair Lift (First Floor, Entry Vestibule)
- Green Paint on Concrete Stairs (First Floor, Entry Vestibule)
- Aqua Paint on Wood Window Sill (First Floor, Staff Toilet 105)
- White Paint on Wood Door Frame (First Floor, Staff Toilet 105)
- White Paint on Brick Wall (First Floor, Staff Toilet 105 Vestibule)
- Blue Paint on Metal Door (First Floor, Stairs)
- Beige Paint on Metal Door Frame (First Floor, Stairs)
- Beige Paint on Plaster Ceiling (First Floor, Auditorium Vestibule)
- Light Blue Paint on Gypsum Wall (First Floor, Principal Office 110)

- Light Blue Paint on Wood Door (First Floor, Principal Office 110)
- Light Blue Paint on Wood Door Frame (First Floor, Principal Office 110)
- Black Paint on Wood Exterior Door (First Floor, Main Entrance)
- Black Paint on Metal Exterior Handrail (First Floor, Main Entrance)

C. PCB-CONTAINING MATERIAL

Analytical results of the bulk samples collected indicate that the following materials **contain PCB** (greater than 50 PPM):

- **None**

Analytical results of the bulk samples collected indicate that the following materials **did not contain PCB** (less than 50 PPM):

- Exterior Door Frame Caulking (White) - (First Floor, Main Entrance)
- Exterior Window Frame Caulking (White) - (First Floor, Main Entrance)

2.0 FIELD INSPECTION PROCEDURES AND SAMPLE ANALYSIS METHODS

A. ASBESTOS-CONTAINING MATERIAL

Guidelines used for the inspection were established by the Environmental Protection Agency (EPA) in the Guidance for Controlling Asbestos Containing Materials in Buildings, Office of Pesticides and Toxic Substances, Doc 560/5-85-024, and 40 CFR Part 763, Asbestos Hazard Emergency Response Act (AHERA).

Field information was organized in accordance with the AHERA methodology of homogenous area (HA). During the Inspection, reasonable effort was made to identify all locations and types of ACM materials associated with the scope of work. Sampling has included multiple samples of the same materials chosen at random. However, due to inconsistencies of a manufacturer's processes and the contractor's installation methods, materials of similar construction may contain various amounts of asbestos. Furthermore, some materials that were not originally specified to contain asbestos may in fact contain this mineral. For example, cementitious pipe insulation and plaster were frequently mixed with asbestos at the construction site for ease of application. Locating all asbestos materials can only be definitively achieved by conducting exploratory demolition and sampling every section of pipe insulation, fitting or valve covering, fireproofing, and other suspect ACM.

Bulk samples of suspect ACM are analyzed using polarized light microscopy (PLM) coupled with dispersion staining, as described in 40 CFR Part 763 and the National Emissions Standard for Hazardous Air Pollutants (NESHAPS). NESHAPS is the standard industry protocol for the determination of asbestos in building materials. A suspect material is immersed in a solution of known refractive index and subjected to illumination by polarized light. The color displays that result are compared to a standardized atlas whereby the specific variety of asbestos is determined. It should also be recognized that PLM is primarily a qualitative identification method whereby asbestos percentage, if any, is estimated. While EPA, New York State, and

New York City regulations governing ACM consider materials containing greater then 1-percent as asbestos, accurately quantifying asbestos content below 5-percent has been shown to be unreliable.

The New York State Department of Health has recently revised the PLM Stratified Point Counting Method. The March 25th, 2011 method, "Polarized Light Microscopy Methods for Identifying and Quantifying Asbestos in Bulk Samples" can be found as Item 198.1 in the Environmental Laboratory Approval program (ELAP) Certification manual. Whereas the procedure of analysis for bulk samples that fall into the category of "Non-friable Organically Bound" (NOB) can be found in the March 25th 2011 method "Polarized-Light Microscope Method for Identifying and Quantifying Asbestos in Non-Friable Organically Bound Bulk Samples", Item 198.6 in the ELAP Certification Manual. This category includes any sample in a flexible to rigid asphalt or vinyl matrix (floor tiles, mastic, roofing shingles, roofing felt, etc.). These samples must be "ashed" in a muffle furnace at 480-degrees Celsius (to remove organic matrix), treated with acid (to remove any mineral carbonate), and filtered through a 0.4-micron polycarbonate filter before being analyzed by PLM. The sample must be weighted between each of these steps to track the percent loss of organic matrix.

ELAP has determined that analysis of NOB materials is not reliably performed by PLM. Therefore, if PLM analysis yields results of 1-percent asbestos or less, the result must be confirmed by TEM. For bulk samples that undergo TEM analysis, the March 25th, 2011 method "Transmission Electron Microscope Method for Identifying and Quantitating Asbestos in Non-Friable organically Bound Bulk Samples" must be used and can be found as Item 198.4 in the ELAP Certification Manual. ELAP certified laboratories must include the following statement with their PLM analysis results for each "negative" (1-percent or less asbestos) NOB sample: "Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Before this material can be considered or treated as non-ACM, confirmation must be made by quantitative transmission electron microscopy".

All samples are initially analyzed by Polarized Light Microscopy in accordance with Item 198.1 and 198.6 of the ELAP Certification Manual. Samples which yield a negative PLM result and which are classified as a "non-friable" material, are then re-analyzed utilizing TEM methodology in accordance with Item 198.4 of the ELAP Certification Manual. The laboratory performing both these analysis procedures Atlas Environmental Lab, Corp. located at 255 West 36th Street, New York, NY 10018. The laboratory has received accreditation from the following agencies:

- National Voluntary Laboratory Accreditation Program (Lab Code 500092-0)
- New York State Environmental Laboratory Approval Program (Lab No. 11999)
- American Industrial Hygiene Association Accredited Laboratory (Lab No. 208306)

B. LEAD-BASED PAINT

Painted surfaces within the space equivalents in the scope of work were identified and grouped together by component type, substrate and visible color. In similar fashion, the inspection continued in each space equivalent with the identification of unique combinations of component, substrate and visible color. A random representative area of each unique combination was

sampled and tested. For each of these designated components, an area on the component was chosen which represents the paint on that building component. During the inspection, components that are accessible surfaces, friction surfaces, impact surfaces, or have deteriorated paint was identified.

The readings of paint surfaces were taken using Heuresis Pb200i and RMD LPA-1 XRF Lead Paint Spectrum Analyzers. The Heuresis and LPA-1 method of measurement is based on the spectrometric analysis of lead K-shell X-ray fluorescence within a controlled depth of interrogation. The Heuresis and LPA-1 Analyzers uses a Co-57 radioactive source and an advanced, solid-state, room temperature, radiation detector to generate and detect the x-ray fluorescence spectrum of a painted surface. The spectrum is then analyzed by a microprocessor to eliminate the effects of substrate and other factors such as scattering to allow an accurate determination of the amount of lead on a surface. The Heuresis and LPA-1 automatically analyzes spectrometric data in real time and differentiates the lead signal from the spectrum. The x-ray fluorescence properties are determined through calibration process and are used for automatic substrate correction and calculation of the lead content of a painted surface.

For quality control, the XRF instrument was calibrated using a U.S. Department of Commerce National Institute of Standards and Technology (NIST) Level III 1.0 mg/cm2 lead based paint film. For each calibration, three (3) XRF readings were taken on the paint film. The average of these three (3) readings was then subtracted from the known lead content in the paint film. The difference was compared with an Environmental Protection Agency (EPA)-approved tolerance range. Such calibration procedures were conducted at the start and at the end of the workday

C. POLYCHLORINATED BIPHENYLS (PCBs)

PCBs belong to a broad family of man-made organic chemicals known as chlorinated hydrocarbons. PCBs were domestically manufactured from 1929 until their manufacture was banned in 1979. They have a range of toxicity and vary in consistency from thin, light-colored liquids to yellow or black waxy solids. Due to their non-flammability, chemical stability, high boiling point, and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics, and rubber products; in pigments, dyes, and carbonless copy paper; and many other industrial applications.

Although no longer commercially produced in the United States, PCBs may be present in products and materials produced before the 1979 PCB ban. Products that may contain PCBs include: Transformers and capacitors, Oil used in motors and hydraulic systems, Fluorescent light ballasts, Adhesives and tapes, Caulking, Plastics, etc.

The PCBs used in these products were chemical mixtures made up of a variety of individual chlorinated biphenyl components, known as congeners. Most commercial PCB mixtures are known in the United States by their industrial trade names. The most common trade name is aroclor.

Polychlorinated biphenyls (PCBs) are regulated pursuant to the United States Environmental Protection Agency Code of Federal Regulations (40 CFR Part 761) and the Toxic Substances Control Act (TSCA – 15 U.S.C. 2605). These regulations require certain testing and reporting requirements to determine management, recycling and disposal options for PCBs.

3.0 INSPECTION SCOPE AND MATERIAL ASSESSMENT

The areas inspected for ACM materials that may be impacted by the proposed SED Survey project at the Bedford Hills Elementary School. Locations surveyed include:

- Basement and First Floor

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 08/30/2022 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **Aircell Pipe and Pipe Fitting Insulation - (Basement Wood Shop)**

The following materials **Contain Asbestos as per AHERA Report:**

- **Floor Tiles and Mastic (Ground Floor, Office above Storage Room) - Not Affected by Current SOW**

Analytical results of the bulk samples collected on 08/30/2022 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Interior Stone Wall Mortar (Gray) - (Basement)
- Interior Limestone Mortar (Gray) - (Basement)
- Interior Brick Mortar (Gray) - (Basement)
- Fiberglass Pipe Insulation Wrap (White) - (Basement)
- Pipe Fitting to Fiberglass Pipe Insulation (Gray) - (Basement)
- Cinderblock Wall Mortar (Gray) - (Basement)
- Interior Textured Paint (Green) - (Basement)
- Gypsum Board (White) - (First Floor)
- Joint Compound (White) - (First Floor)
- Interior Brick Mortar (Gray) - (First Floor)
- Mastic Associated with 12”x12” Terrazzo Floor Tile (Beige/Gray) - (First Floor)
- 12”x12” Terrazzo Floor Tile (Red) - (First Floor)
- 12”x12” Terrazzo Floor Tile (Brown) - (First Floor)
- Single Coat Wall Plaster (Gray) - (First Floor)
- 2’x2’ Fissured Ceiling Tile (White) - (First Floor)
- Exterior Stone Wall Mortar (Gray) - (First Floor)
- Exterior Stairs / Pavers Mortar (Gray) - (First Floor)
- Exterior Door Frame Caulking (White) - (First Floor)

- Exterior Textured Paint on Wood (White) - (First Floor)
- Exterior Window Frame Caulking (White) - (First Floor)

D. LEAD-BASED PAINT

Based upon XRF readings, lead has been confirmed to exist in the following tested combinations:

- **Green Paint on Stone Wall (Basement, Woodshop)**
- **White Paint on Brick Wall (Basement, Stair Vestibule 1)**
- **Green Paint on Metal Stair Newel Post (Basement, Stair Vestibule 1)**
- **Green Paint on Metal Stair Stringer (Basement, Stair Vestibule 1)**
- **Gray Paint on Wood Door (Basement, Storage)**
- **Gray Paint on Wood Door Frame (Basement, Storage)**
- **Yellow Paint on Gypsum Wall (First Floor, Staff Toilet 105)**
- **White Paint on Wood Exterior Door Frame (First Floor, Main Entrance)**

Lead was **not detected** in the following tested combinations via XRF readings:

- Green Paint on Concrete Ceiling (Basement, Woodshop)
- Blue Paint on Metal Door (Basement, Woodshop)
- Beige Paint on Metal Door Frame (Basement, Woodshop)
- Green Paint on Metal Ceiling Radiator (Basement, Woodshop)
- Green Paint on Metal Pipe (Basement, Woodshop)
- Green Paint on Concrete Floor (Basement, Stair Vestibule 1)
- Dark Blue Paint on Metal Chair Lift (Basement, Stair Vestibule 2)
- Black Paint on Wood Door (First Floor, Entry Vestibule)
- Wood Paint on Wood Stain Door Frame (First Floor, Entry Vestibule)
- Wood Paint on Wood Stain Door (First Floor, Entry Vestibule)
- Dark Blue Paint on Metal Chair Lift (First Floor, Entry Vestibule)
- Green Paint on Concrete Stairs (First Floor, Entry Vestibule)
- Aqua Paint on Wood Window Sill (First Floor, Staff Toilet 105)
- White Paint on Wood Door Frame (First Floor, Staff Toilet 105)
- White Paint on Brick Wall (First Floor, Staff Toilet 105 Vestibule)
- Blue Paint on Metal Door (First Floor, Stairs)
- Beige Paint on Metal Door Frame (First Floor, Stairs)
- Beige Paint on Plaster Ceiling (First Floor, Auditorium Vestibule)
- Light Blue Paint on Gypsum Wall (First Floor, Principal Office 110)
- Light Blue Paint on Wood Door (First Floor, Principal Office 110)
- Light Blue Paint on Wood Door Frame (First Floor, Principal Office 110)
- Black Paint on Wood Exterior Door (First Floor, Main Entrance)
- Black Paint on Metal Exterior Handrail (First Floor, Main Entrance)

E. PCB-CONTAINING MATERIAL

Analytical results of the bulk samples collected indicate that the following materials **contain PCB** (greater than 50 PPM):

- **None**

Analytical results of the bulk samples collected indicate that the following materials **did not contain PCB** (less than 50 PPM):

- Exterior Door Frame Caulking (White) - (First Floor, Main Entrance)
- Exterior Window Frame Caulking (White) - (First Floor, Main Entrance)

4.0 INSPECTION RESULTS

A. ASBESTOS-CONTAINING MATERIAL

The asbestos inspection involved a thorough visual examination of all areas that may be impacted by the proposed SED Survey project at the Bedford Hills Elementary School. The following suspect materials were sampled and analyzed for asbestos content by WSP:

4.1 Table 4.1 – Suspect Materials Inspected

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
WSP Sampled on 08/30/22			
01	Basement	Interior Stone Wall Mortar (Gray)	NAD
02	Basement	Interior Limestone Mortar (Gray)	NAD
03	Basement	Interior Brick Mortar (Gray)	NAD
04	Basement	Fiberglass Pipe Insulation Wrap (White)	NAD
05	Basement	Pipe Fitting to Fiberglass Pipe Insulation (Gray)	NAD
06	Basement	Cinderblock Wall Mortar (Gray)	NAD
07	Basement	Interior Textured Paint (Green)	NAD
08	First Floor	Gypsum Board (White)	NAD
09	First Floor	Joint Compound (White)	NAD
10	First Floor	Interior Brick Mortar (Gray)	NAD
11	First Floor	Mastic Associated with 12”x12” Terrazzo Floor Tile (Beige/Gray)	NAD
12	First Floor	12”x12” Terrazzo Floor Tile (Red)	NAD
13	First Floor	12”x12” Terrazzo Floor Tile (Brown)	NAD
14	First Floor	Single Coat Ceiling Plaster (Gray)	NAD

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
15	First Floor	2'x2' Fissured Ceiling Tile (White)	NAD
16	First Floor	Exterior Stone Wall Mortar (Gray)	NAD
17	First Floor	Exterior Stairs / Pavers Mortar (Gray)	NAD
18	First Floor	Exterior Door Frame Caulking (White)	NAD
19	First Floor	Exterior Textured Paint on Wood (White)	NAD
20	First Floor	Exterior Window Frame Caulking (White)	NAD
-	**Basement Woodshop**	**Aircell Pipe and Pipe Fitting Insulation**	**ACM**
AHERA Report			
-	**Throughout**	**Floor Tiles and Mastic - Not Affected by Current SOW**	**ACM**

Bold = Positive for ACM NAD = No Asbestos Detected NA/PS = Not analyzed/ positive sample

4.2 CONDITION AND FRIABLITY ASSESSMENT TABLE

For each inspection conducted, the inspector classifies ACM or Assumed ACM materials by friability and condition. This helps to determine the extent of damage in certain areas as well as the potential for further damage and Asbestos release due to disturbance of the material.

Table 4.2 – Condition and Friability Assessment

Location	Material	Quantity	Friability	Condition
Basement Woodshop	Aircell Pipe and Pipe Fitting Insulation	3 LF	Friable	Good

Condition Definitions:
Good: None/Minimal apparent damage to ACM
Fair: Up to 10% localized damage or up to 25% of the entire ACM is damaged
Poor: Over 10% localized damage or over 25% of the entire ACM is damaged

4.3 SAMPLE ANALYSIS TABLE

Laboratory analysis results, in tabular form, are included in Appendix A.

B. LEAD-BASED PAINT

The lead Inspection involved a thorough visual examination of all accessible areas impacted by the proposed SED Survey project at the Bedford Hills Elementary School. The following suspect surfaces were tested for lead content:

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
Previous WSP Report dated 08/30/22						
1	Calibration Check @ 1.0	---	---	---	---	1.1
2	Calibration Check @ 1.0	---	---	---	---	1.0
3	Calibration Check @ 1.0	---	---	---	---	1.0
4	Calibration Check @ 0.0	---	---	---	---	0.2
5	Calibration Check @ 0.0	---	---	---	---	0.1
6	Calibration Check @ 0.0	---	---	---	---	0.1
7	**Basement, Woodshop**	**Wall**	**Green**	**Stone**	**Poor**	**3.7**
8	Basement, Woodshop	Ceiling	Green	Concrete	Poor	0.1
9	Basement, Woodshop	Door	Blue	Metal	Fair	-0.1
10	Basement, Woodshop	Door Frame	Beige	Metal	Fair	-0.1
11	Basement, Woodshop	Ceiling Radiator	Green	Metal	Poor	0.1
12	Basement, Woodshop	Pipe	Green	Metal	Poor	0.1
13	**Basement, Stair Vestibule 1**	**Wall**	**White**	**Brick**	**Intact**	**3.4**
14	**Basement, Stair Vestibule 1**	**Stair Newel Post**	**Green**	**Metal**	**Intact**	**2.8**
15	**Basement, Stair Vestibule 1**	**Stair Stringer**	**Green**	**Metal**	**Intact**	**3.5**
16	Basement, Stair Vestibule 1	Floor	Green	Concrete	Intact	0.3
17	Basement, Stair Vestibule 2	Chair Lift	Dark Blue	Metal	Intact	0.2
18	**Basement, Storage**	**Door**	**Gray**	**Wood**	**Intact**	**17.1**
19	**Basement, Storage**	**Door Frame**	**Gray**	**Wood**	**Intact**	**18.5**
20	First Floor, Entry Vestibule	Door	Black	Wood	Intact	0.2
21	First Floor, Entry Vestibule	Door Frame	Wood	Wood Stain	Intact	0.1
22	First Floor, Entry Vestibule	Door	Wood	Wood Stain	Intact	0.2
23	First Floor, Entry Vestibule	Chair Lift	Dark Blue	Metal	Intact	0.0

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
24	First Floor, Entry Vestibule	Stairs	Green	Concrete	Intact	0.5
25	**First Floor, Staff Toilet 105**	**Wall**	**Yellow**	**Gypsum**	**Intact**	**3.8**
26	First Floor, Staff Toilet 105	Window Sill	Aqua	Wood	Intact	0.1
27	First Floor, Staff Toilet 105	Door Frame	White	Wood	Intact	0.2
28	First Floor, Staff Toilet 105 Vestibule	Wall	White	Brick	Intact	0.2
29	**First Floor, Staff Toilet 105**	**Wall**	**Yellow**	**Gypsum**	**Intact**	**4.0**
30	First Floor, Stairs	Door	Blue	Metal	Intact	0.1
31	First Floor, Stairs	Door Frame	Beige	Metal	Intact	0.1
32	First Floor, Auditorium Vestibule	Ceiling	Beige	Plaster	Intact	0.3
33	First Floor, Principal Office 110	Wall	Light Blue	Gypsum	Intact	0.3
34	First Floor, Principal Office 110	Door	Light Blue	Wood	Intact	0.3
35	First Floor, Principal Office 110	Door Frame	Light Blue	Wood	Intact	0.0
36	First Floor, Main Entrance	Exterior Door	Black	Wood	Intact	0.2
37	**First Floor, Main Entrance**	**Exterior Door Frame**	**White**	**Wood**	**Intact**	**16.6**
38	First Floor, Main Entrance	Exterior Handrail	Black	Metal	Intact	0.1
39	Calibration Check @ 1.0	---	---	---	---	1.1
40	Calibration Check @ 1.0	---	---	---	---	1.1
41	Calibration Check @ 1.0	---	---	---	---	1.1
42	Calibration Check @ 0.0	---	---	---	---	0.2
43	Calibration Check @ 0.0	---	---	---	---	0.3
44	Calibration Check @ 0.0	---	---	---	---	0.2

C. PCB-CONTAINING MATERIAL

The PCB Inspection involved a thorough visual examination of all areas that may be impacted by the proposed SED Survey project at the Bedford Hills Elementary School. The following suspect materials were tested for PCB content:

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	PCB CONTENT (PPM)
01	First Floor	Exterior Door Frame Caulking (White)	ND
02	First Floor	Exterior Window Frame Caulking (White)	ND

5.0 AREAS NOT ACCESSIBLE

During the inspection the following areas were not accessible:

Spaces within Walls/Floors/Ceilings: No destructive sampling was performed on concealed spaces in walls to access plenum, chases etc. It should be assumed that asbestos containing materials may exist in these spaces. Any suspect materials encountered during work should be sampled for analysis before work continues.

Building Envelope: No destructive sampling was performed on the building envelope. It should be assumed that asbestos, lead and PCB containing materials may exist in these spaces. Any suspect materials encountered during work should be sampled for analysis before work continues.

6.0 CONCLUSIONS AND RECOMMENDATIONS

ACM & LBP was identified in this inspection that may be impacted as part of the proposed SED Survey project at the Bedford Hills Elementary School.

No PCB have been identified in this inspection that may be impacted as part of the proposed SED Survey project at the Bedford Hills Elementary School.

The ACM, LBP & PCB inspection was conducted at the request of Bedford Central School District for the proposed SED Survey project at the Bedford Hills Elementary School. Any change in the scope of work will require further investigation to accurately classify any additional ACM, LBP or PCBs resulting from the modified or updated scope of work.

7.0 REPORT CERTIFICATIONS

This report, and the supporting data, findings, conclusions, opinions, and recommendations it contains represent the result of WSP's efforts for the environmental inspection work for the Bedford Hills Elementary School, SED Survey project.

Opinions and recommendations presented in this report apply to site conditions and features as they existed at the time of WSP's site visits, and those reasonably foreseeable. They cannot necessarily apply to conditions and features of which WSP is unaware and has not had the opportunity to evaluate.

The conclusions presented in this report are professional opinions solely upon WSP's visual observations of accessible areas, laboratory test data, and current regulatory requirements. These conclusions are intended exclusively for the purpose stated herein and the site indicated for the project indicated.

Prepared by:

Josue Garcia
NYS DOL Inspector

Reviewed by:

Steven Eget, PE
Vice President

APPENDIX A:
ASBESTOS SAMPLE ANALYSIS RESULTS IN TABULAR FORM

APPENDIX A
SAMPLE ANALYSIS RESULTS IN TABULAR FORM
BEDFORD HILLS ELEMENTARY SCHOOL
SED SURVEY PROJECT
123 BABBITT ROAD
BEDFORD HILLS, NY 10507

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
WSP Sampled on 08/30/2022					
01	01	Basement, Woodshop	Interior Stone Wall Mortar (Gray)	NAD	N/A
	02	Basement, Woodshop		NAD	N/A
02	03	Basement, Storage	Interior Limestone Mortar (gray)	NAD	N/A
	04	Basement, Storage		NAD	N/A
03	05	Basement, Stair Vestibule	Interior Brick Mortar (Gray)	NAD	N/A
	06	Basement, Corridor		NAD	N/A
04	07	Basement, Storage/Mech. Room	Fiberglass Pipe Insulation Wrap (White)	NAD	NAD
	08	Basement, Stair Vestibule		NAD	NAD
	09	Basement, Stair by Gym		NAD	NAD
05	10	Basement, Storage/Mech. Room	Pipe Fitting to Fiberglass Pipe Insulation (Gray)	NAD	N/A
	11	Basement, Stair Vestibule		NAD	N/A
	12	Basement, Stair by Gym		NAD	N/A
06	13	Basement, Boiler Room	Cinderblock Wall Mortar (Gray)	NAD	N/A
	14	Basement, Boiler Room		NAD	N/A
07	15	Basement, Woodshop	Interior Textured Paint (Green)	NAD	NAD
	16	Basement, Woodshop		NAD	NAD
08	17	First Floor, Principal Office 110	Gypsum Board (White)	NAD	N/A
	18	First Floor, Lobby		NAD	N/A
09	19	First Floor, Principal Office 110	Joint Compound (White)	NAD	N/A
	20	First Floor, Lobby		NAD	N/A
10	21	First Floor, Lobby	Interior Brick Mortar (Gray)	NAD	N/A
	22	First Floor, Lobby		NAD	N/A

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
11	23	First Floor, Lobby	Mastic Associated with 12”x12” Terrazzo Floor Tile (Beige/Gray)	NAD	NAD
	24	First Floor, Lobby		NAD	NAD
12	25	First Floor, Lobby	12”x12” Terrazzo Floor Tile (Red)	NAD	N/A
	26	First Floor, Lobby		NAD	N/A
13	27	First Floor, Lobby	12”x12” Terrazzo Floor Tile (Brown)	NAD	N/A
	28	First Floor, Lobby		NAD	N/A
14	29	First Floor, Stair	Single Coat Wall Plaster (Gray)	NAD	N/A
	30	First Floor, Lobby by Auditorium		NAD	N/A
	31	First Floor, Stair		NAD	N/A
15	32	First Floor, Principal Office 110	2’x2’ Fissured Ceiling Tile (White)	NAD	NAD
	33	First Floor, Principal Office 110		NAD	NAD
16	34	First Floor, Main Entrance	Exterior Stone Wall Mortar (Gray)	NAD	N/A
	35	First Floor, Main Entrance		NAD	N/A
17	36	First Floor, Main Entrance	Exterior Stairs / Pavers Mortar (Gray)	NAD	N/A
	37	First Floor, Main Entrance		NAD	N/A
18	38	First Floor, Main Entrance	Exterior Door Frame Caulking (White)	NAD	NAD
	39	First Floor, Main Entrance		NAD	NAD
19	40	First Floor, Main Entrance	Exterior Textured Paint on Wood (White)	NAD	NAD
	41	First Floor, Main Entrance		NAD	NAD
20	42	First Floor, Staff Toilet 105	Exterior Window Frame Caulking (White)	NAD	NAD
	43	First Floor, Principal Office 110		NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

APPENDIX B:
ASBESTOS BULK SAMPLE FIELD DATA SHEETS WITH CHAIN OF CUSODY & LABORATORY RESULTS

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Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford Central School District / 31405320.009
Project Address: Bedford Hills E.S.
Collected By: Client
Work Area: Basement, 1st Floor & Exterior

AEL ID# BK0922008
Date Received: 9/1/2022
PLM Date Analyzed: 9/2/2022
TEM Date Analyzed: 9/3/2022
Report Date: 9/4/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
01-01	BK0922008-1	Basement Woodshop - Interior Store Wall Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
01-02	BK0922008-2	Basement Woodshop - Interior Store Wall Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
02-03	BK0922008-3	Basement Storage - Interior Limestone Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
02-04	BK0922008-4	Basement Storage - Interior Limestone Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
03-05	BK0922008-5	Basement Stair Vestibule - Interior Brick Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
03-06	BK0922008-6	Basement Corridor - Interior Brick Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
04-07	BK0922008-7	Basement Storage - Mech Rm - Fiberglass Pipe Insulation Wrap, White	White/Silver, Homogeneous, Non-Fibrous	13.2	8.7	78.1	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
04-08	BK0922008-8	Basement Stair Vestibule - Fiberglass Pipe Insulation Wrap, White	White/Silver, Homogeneous, Non-Fibrous	25.1	6.1	68.8	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
04-09	BK0922008-9	Basement Stair by Gym - Fiberglass Pipe Insulation Wrap, White	White/Silver, Homogeneous, Non-Fibrous	9.7	6.1	84.1	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
05-10	BK0922008-10	Basement Storage - Mech Rm - Pipe Fitting to Fiberglass Pipe Insulation, Gray	Beige, Homogeneous, Friable	Not Applicable			5%CELL 10%FBGL	85%	**NAD**		**X**		

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Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford Central School District / 31405320.009
Project Address: Bedford Hills E.S.
Collected By: Client
Work Area: Basement, 1st Floor & Exterior

AEL ID# BK0922008
Date Received: 9/1/2022
PLM Date Analyzed: 9/2/2022
TEM Date Analyzed: 9/3/2022
Report Date: 9/4/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
05-11	BK0922008-11	Basement Stair Vestibule - Pipe Fitting to Fiberglass Pipe Insulation, Gray	Beige, Homogeneous, Friable	Not Applicable			5%CELL 10%FBGL	85%	**NAD**		**X**		
05-12	BK0922008-12	Basement Stair by Gym - Pipe Fitting to Fiberglass Pipe Insulation, Gray	Beige, Homogeneous, Friable	Not Applicable			5%CELL 10%FBGL	85%	**NAD**		**X**		
06-13	BK0922008-13	Basement Boiler Room - Cinderblock Wall Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
06-14	BK0922008-14	Basement Boiler Room - Cinderblock Wall Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
07-15	BK0922008-15	Basement Woodshop - Interior Textured Paint, Green	Green, Homogeneous, Non-Fibrous	13.4	16.7	69.9	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
07-16	BK0922008-16	Basement Woodshop - Interior Textured Paint, Green	Green, Homogeneous, Non-Fibrous	23.4	51.2	25.5	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
08-17	BK0922008-17	First Floor Principal Office 110 - Gypsum Board, White	White, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	**NAD**		**X**		
08-18	BK0922008-18	First Floor Lobby - Gypsum Board, White	White, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	**NAD**		**X**		
09-19	BK0922008-19	First Floor Principal Office 110 - Joint Compound, White	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
09-20	BK0922008-20	First Floor Lobby - Joint Compound, White	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		

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Project Name/No.: Bedford Central School District / 31405320.009
Project Address: Bedford Hills E.S.
Collected By: Client
Work Area: Basement, 1st Floor & Exterior

AEL ID# BK0922008
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PLM Date Analyzed: 9/2/2022
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Report Date: 9/4/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
10-21	BK0922008-21	First Floor Lobby - Interior Brick Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
10-22	BK0922008-22	First Floor Lobby - Interior Brick Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
11-23	BK0922008-23	First Floor Lobby - Mastic Associated With 12"x12"	Grey, Homogeneous, Non-Fibrous	9.1	4.9	86.0	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
11-24	BK0922008-24	First Floor Lobby - Terrazzo Floor Tile, Beige/Gray	Grey, Homogeneous, Non-Fibrous	10.9	37.4	51.7	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
12-25	BK0922008-25	First Floor Lobby - 12"x12" Terrazzo Floor Tile, Red	Red, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
12-26	BK0922008-26	First Floor Lobby - 12"x12" Terrazzo Floor Tile, Red	Red, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
13-27	BK0922008-27	First Floor Lobby - 12"x12" Terrazzo Floor Tile, Brown	Brown, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
13-28	BK0922008-28	First Floor Lobby - 12"x12" Terrazzo Floor Tile, Brown	Brown, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
14-29	BK0922008-29	First Floor Stair - Single Coat Ceiling Plaster, Brown	Brown, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
14-30	BK0922008-30	First Floor Lobby by Auditorium - Single Coat Ceiling Plaster, Brown	Brown, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		

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Report Date: 9/4/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
14-31	BK0922008-31	First Floor Stair - Single Coat Ceiling Plaster, Brown	Brown, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
15-32	BK0922008-32	First Floor Principal Office 110 - 2'x2' Fissured Ceiling Tile, White	White/Grey, Homogeneous, Non-Fibrous	7.5	85.8	6.7	0%	100%	NAD Inconclusive	NAD		X	X
15-33	BK0922008-33	First Floor Principal Office 110 - 2'x2' Fissured Ceiling Tile, White	White/Grey, Homogeneous, Non-Fibrous	17.4	34.9	47.7	0%	100%	NAD Inconclusive	NAD		X	X
16-34	BK0922008-34	First Floor Main Entrance - Exterior Stone Wall Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
16-35	BK0922008-35	First Floor Main Entrance - Exterior Stone Wall Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
17-36	BK0922008-36	First Floor Main Entrance - Exterior Stairs - Pavers Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
17-37	BK0922008-37	First Floor Main Entrance - Exterior Stairs - Pavers Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
18-38	BK0922008-38	First Floor Main Entrance - Exterior Door Frame Caulking, White	White, Homogeneous, Non-Fibrous	9.0	30.6	60.4	0%	100%	NAD Inconclusive	NAD		X	X
18-39	BK0922008-39	First Floor Main Entrance - Exterior Door Frame Caulking, White	White, Homogeneous, Non-Fibrous	8.7	59.2	32.1	0%	100%	NAD Inconclusive	NAD		X	X
19-40	BK0922008-40	First Floor Main Entrance - Exterior Textured Paint on Wood, White	White, Homogeneous, Non-Fibrous	10.1	20.6	69.3	0%	100%	NAD Inconclusive	NAD		X	X

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Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford Central School District / 31405320.009
Project Address: Bedford Hills E.S.
Collected By: Client
Work Area: Basement, 1st Floor & Exterior

AEL ID# BK0922008
Date Received: 9/1/2022
PLM Date Analyzed: 9/2/2022
TEM Date Analyzed: 9/3/2022
Report Date: 9/4/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	AII %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
19-41	BK0922008-41	First Floor Main Entrance - Exterior Textured Paint on Wood, White	White, Homogeneous, Non-Fibrous	11.1	20.1	68.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X
20-42	BK0922008-42	First Floor Staff Toile 105 - Exterior Window Frame Caulking, White	White, Homogeneous, Non-Fibrous	5.5	37.2	57.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X
20-43	BK0922008-43	First Floor Principal Office 110 - Exterior Window Frame Caulking, White	White, Homogeneous, Non-Fibrous	5.6	48.1	46.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X

MA

Quantitative Analysis (Semi/Full):Bulk Asbestos Analysis-PLM by EPA 600/M4-82-020 per 40 CFR or ELAP198.1 (friable) and 198.6 (NOB) samples for New York.

NAD=no asbestos detected, NA/PS=Not Analyzed/Positive Stop, Trace=<1%,FBGL=Fiberglass, CELL=Cellulose,CHRY=Chrysotile,Amo=Amosite,CRO=Crocidolite,ANTH=Anthophylite, TRE=Tremolite, ACT=Actinolite, NA=not applicable.

PLM is not consistently reliable in detecting Asbestos in floor coverings and similar non friable organically bound materials. NAD or Trace results by PLM are inconclusive.

TEM is currently the only method that can be used to determine if this material can be considered or treated as non asbestos containing in NY State.

All samples were prepared and analyzed in accordance with the EPA "TEM Method for Identifying and Quantifying Asbestos in Non-Fibrous Organically Bound Bulk Samples" ELAP 198.4".

ORG%=Ashed Organic%, AII= Acid Insoluble Inorganic%, ASI= Acid Soluble Inorganic%

NYS-ELAP#11999, NVLAP Lab Code: 500092-0, NJ ID: NY034 "ELCP on NJ won't apply to TEM", CT ID:PH-0154

PLM Analyst: MN TEM Analyst: FC Approved by:

BK0922008

1151

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.009

CLIENT: Bedford Central School District

PROJECT SITE: Bedford Hills E. S.

Project Manager: Alex Smolyar

LOCATION(S) SURVEYED: Basement, 1st Floor & Exterior

PROPOSED PROJECT: SED Survey

DATE(S) OF INSPECTION: 08/30/2022

Inspector(s): Josue Garcia & S. Wong

WSP
TELEPHONE NO.: (212) 612-7900
ADDRESS: One Penn Plaza, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐12 HR. ☐24 HR. ☐48 HR. X 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
01	01	Basement Woodshop	Interior Stone Wall Mortar, Gray		
	02	↓ ↓	↓		
02	03	Basement Storage	Interior Limestone Mortar, Gray		
	04	↓ ↓	↓		
03	05	Basement Stair & Vestibule	Interior Brick Mortar, Gray		
	06	↓ Corridor	↓		
04	07	Basement Storage/Mech. RM	Fiberglass Pipe Insulation		
	08	Stair Vestibule	Wrap, White		
[illegible]	09	↓ Stair by Gym	↓		
05	10	Basement Storage/Mech. RM	Pipe Fittings to Fiberglass		
[illegible]	11	↓ Stair Vestibule	Pipe Insulation, Gray		
	12	↓ Stair by Gym	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
J. Garcia+		/ /				/ /				/ /	
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
Monique Allen		9/1/22	12:55			/ /				/ /	

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

PLM analyst MN 09/02/2022 @ 12:30

BK0922008

1191

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.009
CLIENT: Bedford Central School District
PROJECT SITE: Bedford Hills E.S.
Project Manager: Alex Smolyar

WSP
TELEPHONE NO. : (212) 612-7900
ADDRESS: One Penn Plaza, 4th Floor, New York, NY 10119

LOCATION(S) SURVEYED: Basement, 1st floor >> Exterior
PROPOSED PROJECT : SED Survey
DATE(S) OF INSPECTION: 08/30/2022
Inspector(s): Josue Garcia & T. Wong

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. X 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
06	13	Basement Boiler Room	Cinderblock Wall Mortar, Gray		
	14	↓ ↓	↓		
07	15	Basement Woodshop	Interior Textured Paint, Green		
	16	↓ ↓	↓		
08	17	First Floor Principal Office 110	Gypsum Board, White		
	18	↓ Lobby	↓		
09	19	First Floor Principal Office 110	Joint Compound, White		
	20	↓ Lobby	↓		
10	21	First Floor Lobby	Interior Brick Mortar, Gray		
	22	↓ ↓	↓		
11	23	First Floor Lobby	Mastic Associated with 12"x12"		
	24	↓ ↓	Terrazzo Floor Tile, Beige/Gray		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)			Relinquished by: (print)	(Sign)			Relinquished by: (print)	(Sign)		
J. Garcia+		/ /	AM/PM			/ /	AM/PM			/ /	AM/PM
Received by: (print)	(Sign)			Received by: (print)	(Sign)			Received by: (print)	(Sign)		
Monique A		9/1/22	12:55 AM/PM			/ /	AM/PM			/ /	AM/PM

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

TEM analysis MN 08/02/2022 @ 12:30

BLC922008

WSP

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.009

CLIENT: Bedford Central School District

PROJECT SITE: Bedford Hills E.S.

Project Manager: Alex Smolyar

WSP
TELEPHONE NO. : (212) 612-7900
ADDRESS: One Penn Plaza, 4th Floor, New York, NY 10119

LOCATION(S) SURVEYED : Basement, 1st floor, & Exterior

PROPOSED PROJECT : SED Survey

DATE(S) OF INSPECTION: 08/30/2022

Inspector(s): Josue Garcia & S. Wong

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. X 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
12	25	First Floor Lobby	12"x12" Terrazzo Floor Tile, Red		
	26	↓ ↓	↓		
13	27	First Floor Lobby	12"x12" Terrazzo Floor Tile, Brown		
	28	↓ ↓	↓		
14	29	First Floor Stair	Single Coat Ceiling Plaster, Brown		
	30	↓ Lobby by Auditorium	↓		
	31	↓ Stair	↓		
15	32	First Floor Principal Office 110	2'x2' Fissured Ceiling Tile, White		
	33	↓ ↓	↓		
16	34	First Floor Main Entrance	Exterior Stone Wall Mortar, Gray		
	35	↓ ↓	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)			Relinquished by: (print)	(Sign)			Relinquished by: (print)	(Sign)		
J. Garcia+		/ /	AM/PM			/ /	AM/PM			/ /	AM/PM
Received by: (print)	(Sign)			Received by: (print)	(Sign)			Received by: (print)	(Sign)		
Monique A		9/1/22	12:55 AM/PM			/ /	AM/PM			/ /	AM/PM

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

Plm analyst MN 09/02/2022 @12:30

BLOCK 2008

1191

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.009

CLIENT: Bedford Central School District

PROJECT SITE: Bedford Hills E.S.

Project Manager: Alex Smolyar

WSP
TELEPHONE NO. : (212) 612-7900
ADDRESS: One Penn Plaza, 4th Floor, New York, NY 10119

LOCATION(S) SURVEYED : Basement, 1st Floor & Exterior

PROPOSED PROJECT : SED Survey

DATE(S) OF INSPECTION: 08/30/2022

Inspector(s): Josue Garcia & S. Leung

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐12 HR. ☐24 HR. ☐48 HR. X 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
17	36	First Floor Main Entrance	Exterior Stairs / Pavers Mortar, Gray		
	37	↓ ↓	↓		
18	38	First Floor Main Entrance	Exterior Door Frame Caulking, White		
	39	↓ ↓	↓		
19	40	First Floor Main Entrance	Exterior Textured Paint on Wood, White		
	41	↓ ↓	↓		
20	42	First Floor Staff Toilet 105	Exterior Window Frame Caulking, White		
	43	↓ Principal Office 110	↓		

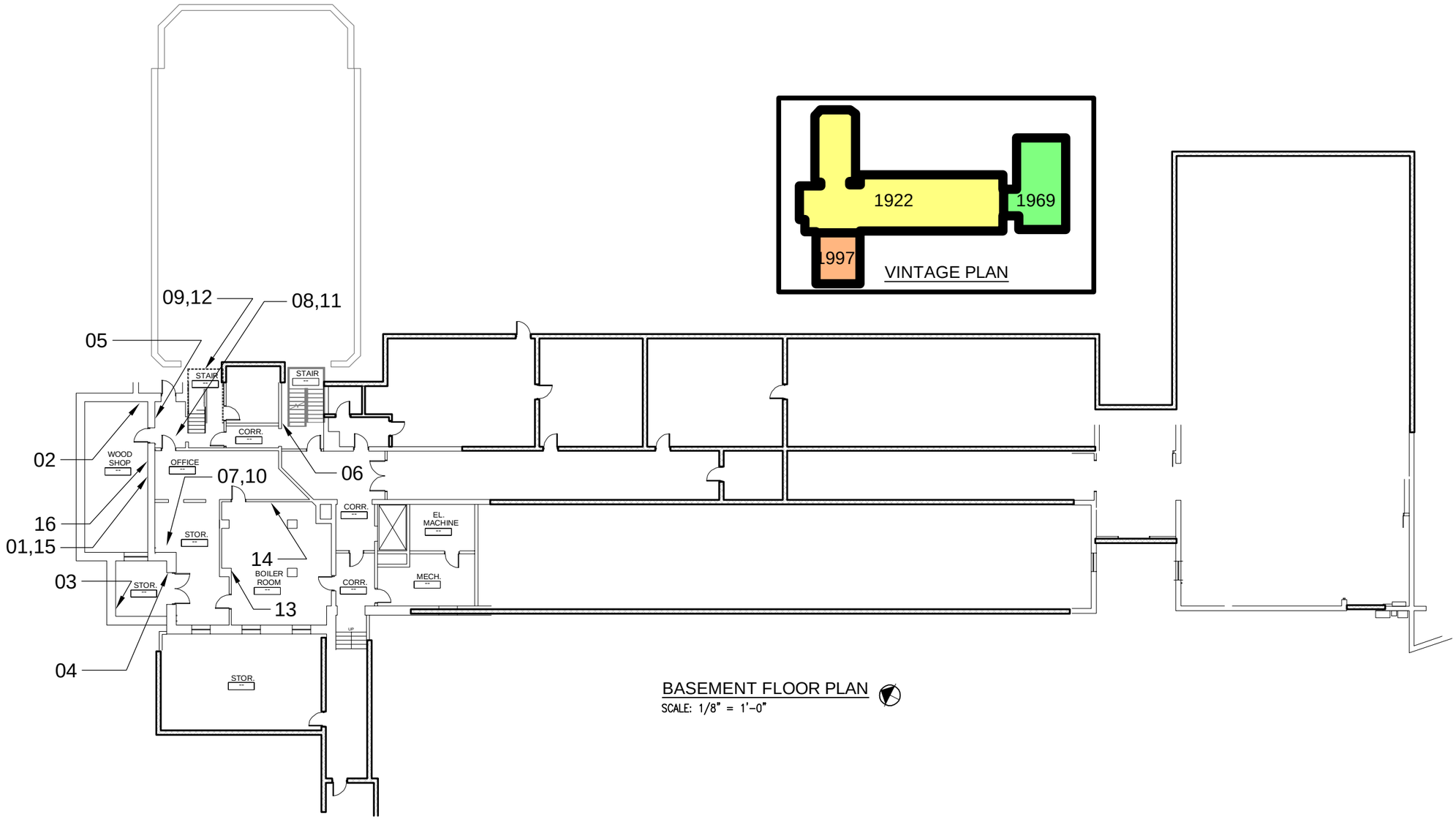
CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)			Relinquished by: (print)	(Sign)			Relinquished by: (print)	(Sign)		
J. Garcia+		/ /	AM/PM			/ /	AM/PM			/ /	AM/PM
Received by: (print)	(Sign)			Received by: (print)	(Sign)			Received by: (print)	(Sign)		
Monique A		9/1/22	12:55 AM/PM			/ /	AM/PM			/ /	AM/PM

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

Plm analyst MN 09/02/2022 @ 12:30

APPENDIX C:
ASBESTOS BULK SAMPLE LOCATION DRAWINGS



BASEMENT FLOOR PLAN

SCALE: 1/8" = 1'-0"

BEDFORD CENTRAL SCHOOL DISTRICT
Every Single Student, Every Single Day

BEDFORD
CENTRAL SCHOOL
DISTRICT

632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL: 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

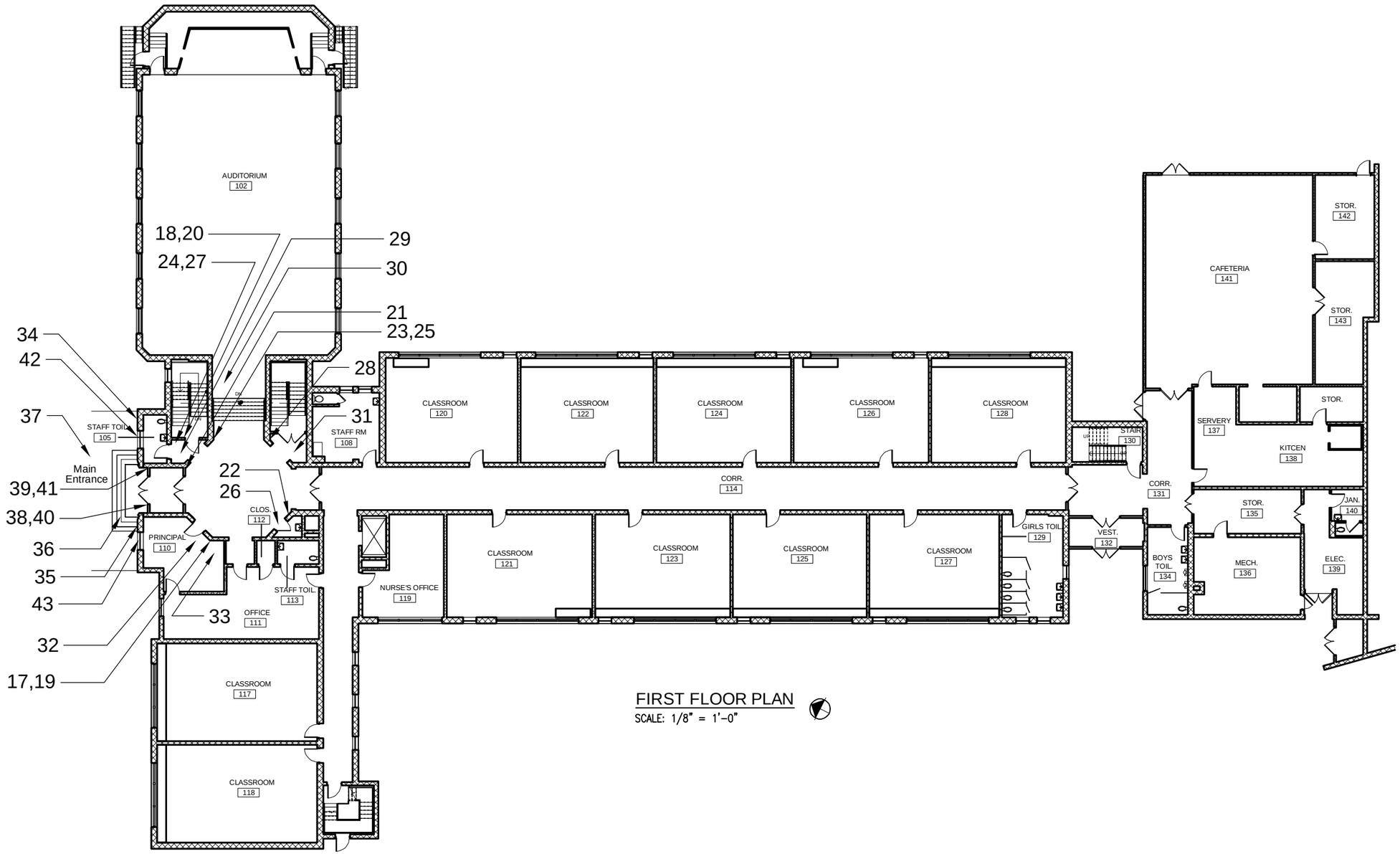
BEDFORD HILLS
ELEMENTARY SCHOOL
SED SURVEY PROJECT
123 BABBITT ROAD
BEDFORD HILLS, NY 10507

DRAWING TITLE

BULK SAMPLE LOCATIONS
BASEMENT FLOOR PLAN

DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV. J. GARCIA	DATE: 09/26/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A. SMOLYAR	BSL001
	DRAWING NUMBER 1 OF 2

CONSULTANTS PROJECT 31405320.009



FIRST FLOOR PLAN

SCALE: 1/8" = 1'-0"

BEDFORD CENTRAL SCHOOL DISTRICT

Every Single Student, Every Single Day

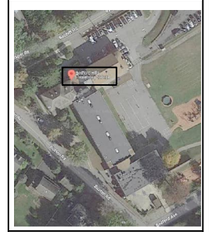
BEDFORD
CENTRAL SCHOOL
DISTRICT

632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 400
Valhalla, NY 10595
TEL. 914.742.1120

KEY PLAN:



REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

BEDFORD HILLS
ELEMENTARY SCHOOL
SED SURVEY PROJECT
123 BABBITT ROAD
BEDFORD HILLS, NY 10507

DRAWING TITLE

BULK SAMPLE LOCATIONS
FIRST FLOOR PLAN

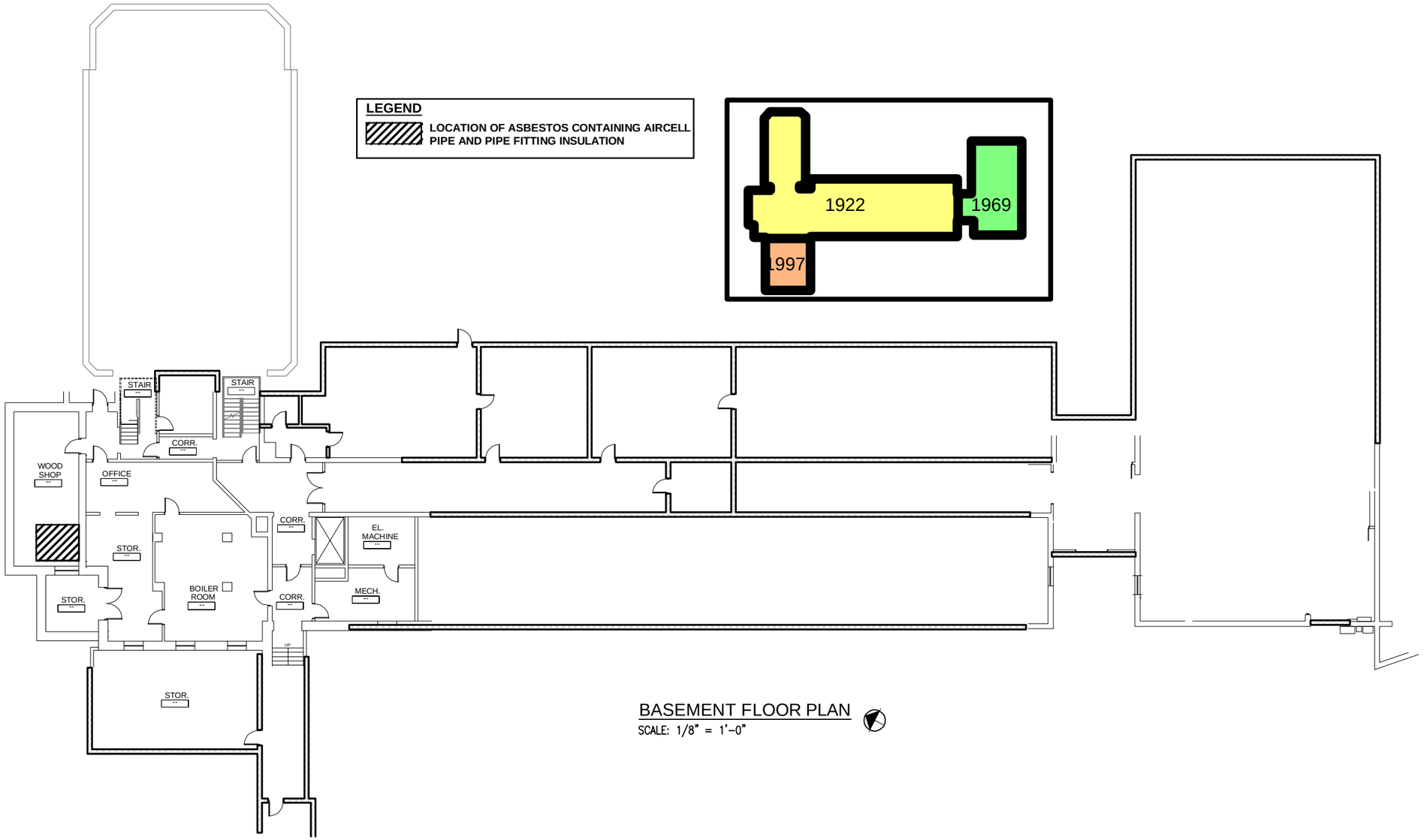
DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV. J.GARCIA	DATE: 09/26/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A.SMOLYAR	BSL002
	DRAWING NUMBER 2 OF 2

CONSULTANTS PROJECT 31405320.009

APPENDIX D:
ASBESTOS CONTAINING MATERIALS LOCATION DRAWINGS

LEGEND

LOCATION OF ASBESTOS CONTAINING AIRCELL PIPE AND PIPE FITTING INSULATION



BASEMENT FLOOR PLAN

SCALE: 1/8" = 1'-0"

BEDFORD CENTRAL SCHOOL DISTRICT
Every Single Student, Every Single Day

BEDFORD
CENTRAL SCHOOL
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BEDFORD, NY 10506

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL: 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

BEDFORD HILLS
ELEMENTARY SCHOOL
SED SURVEY PROJECT
123 BABBITT ROAD
BEDFORD HILLS, NY 10507

DRAWING TITLE

ASBESTOS CONTAINING
MATERIALS
BASEMENT FLOOR PLAN

DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV. J.GARCIA	DATE: 09/26/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A.SMOLYAR	ACM001
	DRAWING NUMBER 1 OF 1

CONSULTANTS PROJECT 31405320.009

APPENDIX E:
LEAD XRF SHOT RESULTS

XRF CALIBRATION CHECK FORM

PAGE 1 OF 1

PROJ. NO.:	31405320.009	DATE:	08/30/2022
PROJECT NAME:	Bedford Hills ES, SED Survey	INSPECTOR NAME:	J Garcia [illegible]
CLIENT:	Bedford CSD	INSPECTOR SIGNATURE:	[signature]
SITE:		PROJ. MANAGER:	A. Smolyar

LOUIS BERGER a WSP USA Company
TELEPHONE #: (212) 612-7900
FAX #: (212) 425-1618
ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014

XRF MAKE/MODEL: RMD LPA-1 (Serial#3675) Heuresis Pb200i (Serial#2150)

LLW#:

JOB#: 08300921

NOTES:

CALIBRATION CHECK – PRIOR TO LEAVING OFFICE

1.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 8:56	TEST #	01	02	03	1.0
	XRF READING	1.1	1.0	1.0	

CALIBRATION CHECK – PRIOR TO LEAVING OFFICE

0.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 8:59	TEST #	04	05	06	0.1
	XRF READING	0.2	0.1	0.1	

CALIBRATION CHECK – FIELD-START

1.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 10:45	TEST #	39	40	41	1.1
	XRF READING	1.1	1.1	1.1	

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

0.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 10:48	TEST #	42	43	44	0.2
	XRF READING	0.2	0.3	0.2	

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

______ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ______	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

______ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ______	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

______ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ______	TEST #				
	XRF READING				

XRF LEAD-BASED PAINT TESTING DATA SHEET/CHAIN OF CUSTODY

PROJECT NO.: 31405320.009
CLIENT: Bedford CSD
INSPECTOR(S): J. Garcia & J. Wong
PROJ. MANAGER: A Smylor

PROJECT NAME: Bedford Hills ES
PROJECT LOCATION:
INSPECTION DATE: 08/30/2022

SPACE CHARACTERISTICS:
FLOOR #: _____ ROOM #: _____ ROOM NAME: _____

NOTES:

SAMPLE #	SUBSTRATE	COMPONENT DISCRIPTION: COLOR	CONDITION [I / F / P]	COMPONENT	WALL/SIDE DESIGN.	SIDE [L/C/R]	HEIGHT [L/M/U]	COMPONENT REPLICANT	QUANTITY (IF POSITIVE) [SF]	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	XRF READING [mg/cm²]
07	M PL S C CB PG CR B W V CT G FG OTHER: Stone	Green	P	Wall	A B C D RM CTR FL CL	Paint	Wood Shop					3.7
08	M PL S C CB PG CR B W V CT G FG OTHER:	"	P	Ceiling	A B C D RM CTR FL CL							0.1
09	M PL S C CB PG CR B W V CT G FG OTHER:	Blue	F	Door	A B C D RM CTR FL CL							0.1
10	M PL S C CB PG CR B W V CT G FG OTHER:	Beige	F	DF	A B C D RM CTR FL CL							0.1
11	M PL S C CB PG CR B W V CT G FG OTHER:	Green		Ceiling Radiator	A B C D RM CTR FL CL							0.1
12	M PL S C CB PG CR B W V CT G FG OTHER:	"		Pipe	A B C D RM CTR FL CL							0.1
13	M PL S C CB PG CR B W V CT G FG OTHER:	White		Wall	A B C D RM CTR FL CL		Stair Vestibule				1	3.4
14	M PL S C CB PG CR B W V CT G FG OTHER:	Green		Stair Newel Post	A B C D RM CTR FL CL							2.8
15	M PL S C CB PG CR B W V CT G FG OTHER:	"		Stair Stringer	A B C D RM CTR FL CL							3.5
16	M PL S C CB PG CR B W V CT G FG OTHER:	"		Floor	A B C D RM CTR FL CL							0.3
17	M PL S C CB PG CR B W V CT G FG OTHER:	Dark Blue		Chair Lift	A B C D RM CTR FL CL				4		2	0.2
18	M PL S C CB PG CR B W V CT G FG OTHER:	Gray		Door	A B C D RM CTR FL CL		Storage					17.1
19	M PL S C CB PG CR B W V CT G FG OTHER:	"		DF	A B C D RM CTR FL CL			1				18.5
20	M PL S C CB PG CR B W V CT G FG OTHER:	Black		Door	A B C D RM CTR FL CL	1st	Floor	Ent	Vestibule			0.2
21	M PL S C CB PG CR B W V CT G FG OTHER:	Wood Stain		DF	A B C D RM CTR FL CL							0.1
22	M PL S C CB PG CR B W V CT G FG OTHER:	"		Door	A B C D RM CTR FL CL							0.2
23	M PL S C CB PG CR B W V CT G FG OTHER:	Dark Blue		Chair Lift	A B C D RM CTR FL CL							0.0
24	M PL S C CB PG CR B W V CT G FG OTHER:	Green		Stairs	A B C D RM CTR FL CL							0.5
25	M PL S C CB PG CR B W V CT G FG OTHER:	Yellow		Wall	A B C D RM CTR FL CL				Bathroom			3.8
26	M PL S C CB PG CR B W V CT G FG OTHER:	Light Aqua		Window Sill	A B C D RM CTR FL CL				1			0.1

Side: Left/Center/Right; Height: Lower/Middle/Upper; Substrate: M: Metal; PL: Plaster; S: Sheetrock; C: Concrete; CB: Cinder Block; CR: Sinks, Water Closets, etc.; CT: Ceramic Tile; PG: Porcelain-glazed Block; B: Brick; W: Wood; V: Vinyl; FG: Fiberglass; G: Glass ; Condition: I = Intact; F = Fair; P = Poor; Initial Result: P = Positive; N = Negative;

XRF LEAD-BASED PAINT TESTING DATA SHEET/CHAIN OF CUSTODY

PROJECT NO.: 31405320.009
CLIENT: Bedford CSD
INSPECTOR(S): J. Garcia & J. Wong
PROJ. MANAGER: A. Smolyar

PROJECT NAME: Bedford Hill ES
PROJECT LOCATION:
INSPECTION DATE: 08/30/2022

SPACE CHARACTERISTICS:

FLOOR #: ____ ROOM #: ____ ROOM NAME: ____

NOTES:

SAMPLE #	SUBSTRATE	COLOR	CONDITION [I/F/P]	COMPONENT	WALL/SIDE DESIGN.	SIDE [L/C/R]	HEIGHT [L/M/U]	COMPONENT REPLICANT	QUANTITY (IF POSITIVE) [SF]	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	XRF READING [mg/cm²]
27	M PL S C CB PG CR B (W) V CT G FG OTHER:	White		DF	A B C D RM CTR FL CL	1st Fl			Bathroom			0.2
28	M PL S C CB PG CR (B) W V CT G FG OTHER:	"		~~[illegible]~~ Wall	A B C D RM CTR FL CL		↓		↓	Vestibule		0.2
29	M PL (S) C CB PG CR B W V CT G FG OTHER:	Yellow		Wall	A (B) C D RM CTR FL CL				Bathroom			4.0
30	(M) PL S C CB PG CR B W V CT G FG OTHER:	Blue		Door	A B C D RM CTR FL CL				Stairs			0.1
31	(M) PL S C CB PG CR B W V CT G FG OTHER:	Beige		DF	A B C D RM CTR FL CL				↓			0.1
32	M (PL) S C CB PG CR B W V CT G FG OTHER:	~~Beige~~		Ceiling	A B C D RM CTR FL CL				Auditorium		Vestibule	0.3
33	M PL (S) C CB PG CR B W V CT G FG OTHER:	Light Blue		Wall	A B C D RM CTR FL CL				Office			0.3
34	M PL S C CB PG CR B (W) V CT G FG OTHER:	↓		Door	A B C D RM CTR FL CL				↓			0.3
35	M PL S C CB PG CR B (W) V CT G FG OTHER:			DF	A B C D RM CTR FL CL	↓						0.0
36	M PL S C CB PG CR B (W) V CT G FG OTHER:	Black		Ext Door	A B C D RM CTR FL CL	Ext			Main Exit			0.2
37	M PL S C CB PG CR B (W) V CT G FG OTHER:	White		Ext DF	A B C D RM CTR FL CL				↓			16.6
38	(M) PL S C CB PG CR B W V CT G FG OTHER:	Black		Ext Handrail	A B C D RM CTR FL CL							0.1
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							

Side: Left/Center/Right; **Height**: Lower/Middle/Upper; **Substrate**: M: Metal; PL: Plaster; S: Sheetrock; C: Concrete; CB: Cinder Block; CR: Sinks, Water Closets, etc.; CT: Ceramic Tile; PG: Porcelain-glazed Block; B: Brick; W: Wood; V: Vinyl; FG: Fiberglass; G: Glass ; **Condition**: I = Intact; F = Fair; P = Poor; Initial Result: P = Positive; N = Negative;

APPENDIX F:
PCB BULK SAMPLE FIELD DATA SHEETS WITH CHAIN OF CUSTODY & LABORATORY RESULTS

Technical Report

prepared for:

WSP USA (New York, NY)
One Penn Plaza, 2nd Floor
New York NY, 10119
Attention: Alexander Smolyar

Report Date: 09/20/2022
Client Project ID: 31405320.009
York Project (SDG) No.: 22I0265

Report Date: 09/20/2022
Client Project ID: 31405320.009
York Project (SDG) No.: 22I0265

WSP USA (New York, NY)
One Penn Plaza, 2nd Floor
New York NY, 10119
Attention: Alexander Smolyar

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on September 07, 2022 and listed below. The project was identified as your project: **31405320.009**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Sample and Analysis Qualifiers section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the Sample and Data Qualifiers Relating to This Work Order section of this report and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
22I0265-01	01 01/02/03	Caulk	09/06/2022	09/07/2022
22I0265-02	02 04/05/06	Caulk	09/06/2022	09/07/2022

General Notes for York Project (SDG) No.: 22I0265

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All analyses conducted met method or Laboratory SOP requirements. See the Sample and Data Qualifiers Section for further information.
6. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
7. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.
8. Analyses conducted at York Analytical Laboratories, Inc. Stratford, CT are indicated by NY Cert. No. 10854; those conducted at York Analytical Laboratories, Inc., Richmond Hill, NY are indicated by NY Cert. No. 12058.

Approved By:  **Date:** 09/20/2022

Cassie L. Mosher
Laboratory Manager

Sample Information

Client Sample ID: 01 01/02/03 **York Sample ID:** 22I0265-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22I0265	31405320.009	Caulk	September 6, 2022 3:00 pm	09/07/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.373	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:24	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.373	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:24	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.373	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:24	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.373	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:24	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.373	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:24	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.373	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:24	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.373	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:24	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.373	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,NJDEP	09/20/2022 16:24	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.373	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,NJDEP	09/20/2022 16:24	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.373	1	EPA 8082A Certifications:	09/20/2022 08:24	09/20/2022 16:24	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*80.0 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*90.5 %*	*30-140*

Sample Information

Client Sample ID: 02 04/05/06 **York Sample ID:** 22I0265-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22I0265	31405320.009	Caulk	September 6, 2022 3:00 pm	09/07/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.450	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:37	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.450	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:37	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.450	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:37	BJ

Sample Information

Client Sample ID: 02 04/05/06 **York Sample ID:** 22I0265-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22I0265	31405320.009	Caulk	September 6, 2022 3:00 pm	09/07/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
53469-21-9	Aroclor 1242	ND		mg/kg	0.450	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:37	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.450	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:37	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.450	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:37	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.450	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:37	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.450	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,NJDEP	09/20/2022 16:37	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.450	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,NJDEP	09/20/2022 16:37	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.450	1	EPA 8082A Certifications:	09/20/2022 08:24	09/20/2022 16:37	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*87.0 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*94.0 %*	*30-140*

Analytical Batch Summary

Batch ID: BI20998 **Preparation Method:** EPA 3550C **Prepared By:** KEO

YORK Sample ID	Client Sample ID	Preparation Date
22I0265-01	01 01/02/03	09/20/22
22I0265-02	02 04/05/06	09/20/22
BI20998-BLK1	Blank	09/20/22
BI20998-BS1	LCS	09/20/22
BI20998-BSD1	LCS Dup	09/20/22

Polychlorinated Biphenyls by GC/ECD - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BI20998 - EPA 3550C											
Blank (BI20998-BLK1)								Prepared & Analyzed: 09/20/2022			
Aroclor 1016	ND	0.455	mg/kg								
Aroclor 1221	ND	0.455	"								
Aroclor 1232	ND	0.455	"								
Aroclor 1242	ND	0.455	"								
Aroclor 1248	ND	0.455	"								
Aroclor 1254	ND	0.455	"								
Aroclor 1260	ND	0.455	"								
Aroclor 1262	ND	0.455	"								
Aroclor 1268	ND	0.455	"								
Total PCBs	ND	0.455	"								
Surrogate: Tetrachloro-m-xylene	*1.74*		*"*	*1.82*		*95.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*2.14*		*"*	*1.82*		*118*	*30-140*				
LCS (BI20998-BS1)								Prepared & Analyzed: 09/20/2022			
Aroclor 1016	9.77	0.455	mg/kg	9.09		107	40-130				
Aroclor 1260	10.3	0.455	"	9.09		113	40-130				
Surrogate: Tetrachloro-m-xylene	*1.81*		*"*	*1.82*		*99.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*2.28*		*"*	*1.82*		*126*	*30-140*				
LCS Dup (BI20998-BSD1)								Prepared & Analyzed: 09/20/2022			
Aroclor 1016	8.06	0.455	mg/kg	9.09		88.7	40-130		19.1	25	
Aroclor 1260	8.96	0.455	"	9.09		98.5	40-130		13.9	25	
Surrogate: Tetrachloro-m-xylene	*1.59*		*"*	*1.82*		*87.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*1.94*		*"*	*1.82*		*106*	*30-140*				
Batch Y2I1942 - BI20998											
Aroclor Reference (Y2I1942-ARC1)								Prepared & Analyzed: 09/19/2022			
Surrogate: Tetrachloro-m-xylene	*0.200*		*ug/mL*	*0.200*		*100*					
Surrogate: Decachlorobiphenyl	*0.184*		*"*	*0.200*		*92.0*					

Sample and Data Qualifiers Relating to This Work Order

Definitions and Other Explanations

*	Analyte is not certified or the state of the samples origination does not offer certification for the Analyte.
ND	NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
LOQ	LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence. This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon NELAC 2009 Standards and applies to all analyses.
LOD	LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.
MDL	METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.
Reported to	This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two. For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the LOD/MDL, with values between the LOD/MDL and the LOQ being "J" flagged as estimated results.

For analyses by EPA SW-846-8270D, the Limit of Quantitation (LOQ) reported for benzidine is based upon the lowest standard used for calibration and is not a verified LOQ due to this compound's propensity for oxidative losses during extraction/concentration procedures and non-reproducible chromatographic performance.

PCB SURVEY DATA SHEET/ CHAIN OF CUSTODY

WSP PROJ #: 31405320.009
CLIENT: Bedford Central School District
Project Site: Bedford Hills ES 123 Babbitt Road, Bedford Hills, NY 10507
Project Manager: Alex Smolyar

LOCATION(S) SURVEYED: Basement, 1st Floor & Exterior
PROPOSED PROJECT : SED Survey
DATE(S) OF INSPECTION: 08/30/2022
Inspector(s) Josue Garcia & J. Wong

22I0265

WSP
TELEPHONE N0. : (212) 612-7900 **FAX N0.: (212) 363-4341**
ADDRESS: 96 Morton Street, 8 Floor, New York, NY 10014

RESULTS TO:

TURNAROUND TIME:
☐48 HR ☐72 H R ☐96 HR X 120 HR

LAB SAMPLE NO.	HA	SAMPLE NO.	MATERIAL DESCRIPTION	SAMPLE LOCATION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
	01	01	First Floor Main Entrance	Exterior Door Frame Caulking, White		
		02	↓	↓		
		03	↓	↓		
	02	04	First Floor Staff Toilet 105	Exterior Window Frame		
		05	Principal office 110	Caulking, White		
		06	↓	↓		

CHAIN OF CUSTODY

Relinquished by (print)	(Sign)		Received by (print)	(Sign)		
J. Garcia		9/6/22	Andrew Stur		9/7/22	9:50 AM/PM
Andrew Stur		9/7/22				AM/PM

Relinquished by (print)	(Sign)		Received by (print)	(Sign)		
Andrew Stur		9/7/22	1256 AM/PM			AM/PM
		/ /				AM/PM

Relinquished by (print)	(Sign)		Received by (print)	(Sign)		
		/ /	AM/PM		9/7/22	1256 AM/PM
		/ /	AM/PM		/ /	AM/PM

5.3°C

LAB INSTRUCTIONS: create one (1) composite sample of each homogeneous material from equal mass portions (± 5%) of the three (3) sub-samples for extraction and analysis via EPA Method 8082 and report the Arochlors listed (Arochlor 1016, Arochlor 1221, Arochlor 1232, Arochlor 1242, Arochlor 1248, Arochlor 1254, Arochlor 1260). The laboratory shall target a PCB detection limit of 1 ppm

APPENDIX G:
COMPANY LICENSE, PERSONAL CERTIFICATIONS AND LABORATORY ACCREDITATIONS

New York State – Department of Labor
Division of Safety and Health
License and Certificate Unit
State Campus, Building 12
Albany, NY 12240

ASBESTOS HANDLING LICENSE

WSP USA Solutions Inc.
4th Floor
One Penn Plaza

New York, NY 10119

FILE NUMBER: 19-132876
LICENSE NUMBER: 132876
LICENSE CLASS: RESTRICTED
DATE OF ISSUE: 03/31/2022
EXPIRATION DATE: 03/31/2023

Duly Authorized Representative – Craig Napolitano:

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Amy Phillips, Director
For the Commissioner of Labor

SH 432 (8/12)

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2023
Issued April 01, 2022

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MS. JACKIE DARVISH
ATLAS ENVIRONMENTAL LABS CORP
255 W 36TH STREET SUITE 1503
NEW YORK, NY 10018

NY Lab Id No: 11999

is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:

Miscellaneous

Asbestos in Friable Material	Item 198.1 of Manual
	EPA 600/M4/82/020
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)
Asbestos in Non-Friable Material-TEM	Item 198.4 of Manual
Asbestos-Vermiculite-Containing Material	Item 198.8 of Manual
Lead in Dust Wipes	EPA 7000B
Lead in Paint	EPA 7000B

Sample Preparation Methods

EPA 3050B

Serial No.: 64911

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Atlas Environmental Lab (Asbestos in Bulk)
255 W 36th Street Suite #1503
New York, NY 10018
Ms. Jackie Darvish
Phone: 212-563-0400 Fax: 212-563-0401
Email: jdarvish@atlasenvironmentallab.com
http://www.atlasenvironmentallab.com

ASBESTOS FIBER ANALYSIS — NVLAP LAB CODE 500092-0

Bulk Asbestos Analysis

Code	*Description*
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

Code	*Description*
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

For the National Voluntary Laboratory Accreditation Program

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 500092-0

Atlas Environmental Lab (Asbestos in Bulk)

New York, NY

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2021-10-01 through 2022-09-30

Effective Dates

For the National Voluntary Laboratory Accreditation Program

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

Atlas Environmental Lab

255 W 36th Street, Suite 1503, New York, NY 10018

Laboratory ID: LAP-208306

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA LAP), LLC accreditation to the ISO/IEC 17025:2017 international standard, General Requirements for the Competence of Testing and Calibration Laboratories in the following:

LABORATORY ACCREDITATION PROGRAMS

☑	**INDUSTRIAL HYGIENE**	Accreditation Expires: August 01, 2023
☑	**ENVIRONMENTAL LEAD**	Accreditation Expires: August 01, 2023
☑	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires: August 01, 2023
☐	**FOOD**	Accreditation Expires:
☐	**UNIQUE SCOPES**	Accreditation Expires:

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached Scope of Accreditation. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2017 and AIHA LAP, LLC requirements. This certificate is not valid without the attached Scope of Accreditation. Please review the AIHA LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

Cheryl O. Morton

Cheryl O Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision19.1: 07/28/2021

Date Issued: 07/28/2021

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2023
Issued April 01, 2022

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. ROBERT Q. BRADLEY
YORK ANALYTICAL LABORATORIES INC
120 RESEARCH DRIVE
STRATFORD, CT 06615

NY Lab Id No: 10854

is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards (2016) for the category ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved analytes are listed below:

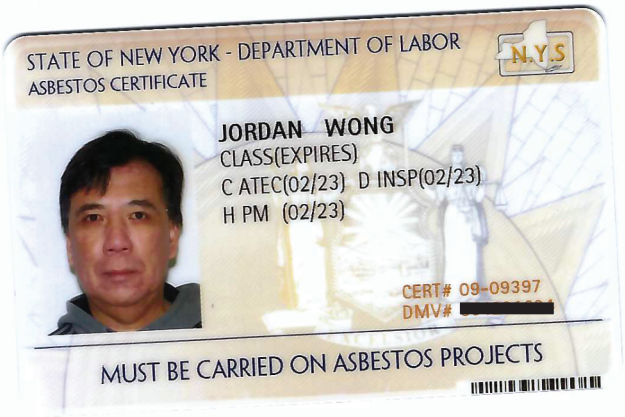
Polychlorinated Biphenyls

Aroclor 1016 (PCB-1016)	EPA 8082A
Aroclor 1016 (PCB-1016) in Oil	EPA 8082A
Aroclor 1221 (PCB-1221)	EPA 8082A
Aroclor 1221 (PCB-1221) in Oil	EPA 8082A
Aroclor 1232 (PCB-1232)	EPA 8082A
Aroclor 1232 (PCB-1232) in Oil	EPA 8082A
Aroclor 1242 (PCB-1242)	EPA 8082A
Aroclor 1242 (PCB-1242) in Oil	EPA 8082A
Aroclor 1248 (PCB-1248)	EPA 8082A
Aroclor 1248 (PCB-1248) in Oil	EPA 8082A
Aroclor 1254 (PCB-1254)	EPA 8082A
Aroclor 1254 (PCB-1254) in Oil	EPA 8082A
Aroclor 1260 (PCB-1260)	EPA 8082A
Aroclor 1260 (PCB-1260) in Oil	EPA 8082A
Aroclor 1262 (PCB-1262)	EPA 8082A
Aroclor 1262 (PCB-1262) in Oil	EPA 8082A
Aroclor 1268 (PCB-1268)	EPA 8082A
Aroclor 1268 (PCB-1268) in Oil	EPA 8082A

Polynuclear Aromatic Hydrocarbons

Acenaphthene	EPA 8270D
	EPA 8270E
Acenaphthylene	EPA 8270D

Serial No.: 65074


STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE
N.Y.S
JORDAN WONG
CLASS(EXPIRES)
C ATEC(02/23) D INSP(02/23)
H PM (02/23)
CERT# 09-09397
DMV# [redacted]
MUST BE CARRIED ON ASBESTOS PROJECTS

United States Environmental Protection Agency

This is to certify that

Jordan Wong

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Risk Assessor

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires January 11, 2025

LBP-R-I183144-2

Certification #

November 22, 2021

Issued On

Ben Conetta, Chief

Chemicals and Multimedia Programs Branch

STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE

N.Y.S.

JOSUE GARCIA
CLASS(EXPIRES)
C ATEC(08/22) D INSP(08/22)
H PM (08/22) I PD (08/22)

CERT# 01-04282
DMV# 815004194

MUST BE CARRIED ON ASBESTOS PROJECTS

United States Environmental Protection Agency

This is to certify that

Josue Garcia

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Risk Assessor

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires April 09, 2023

LBP-R-6928-2
Certification #

January 28, 2020
Issued On

Susan Schulz, Acting Chief
Chemicals and Multimedia Programs Branch

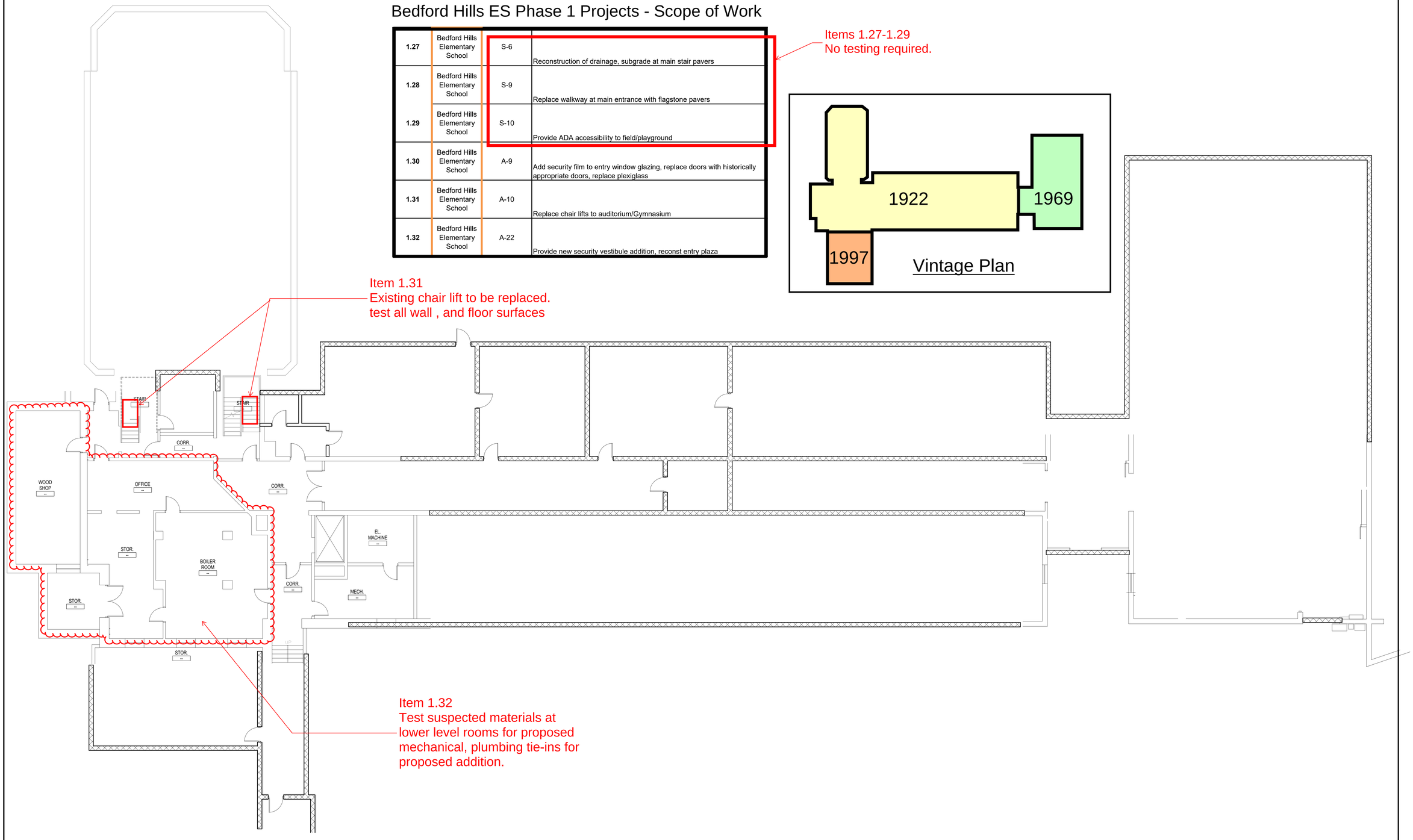
APPENDIX H:
SCOPE OF WORK DRAWINGS

Bedford Hills ES Phase 1 Projects - Scope of Work

1.27	Bedford Hills Elementary School	S-6	Reconstruction of drainage, subgrade at main stair pavers
1.28	Bedford Hills Elementary School	S-9	Replace walkway at main entrance with flagstone pavers
1.29	Bedford Hills Elementary School	S-10	Provide ADA accessibility to field/playground
1.30	Bedford Hills Elementary School	A-9	Add security film to entry window glazing, replace doors with historically appropriate doors, replace plexiglass
1.31	Bedford Hills Elementary School	A-10	Replace chair lifts to auditorium/Gymnasium
1.32	Bedford Hills Elementary School	A-22	Provide new security vestibule addition, reconst entry plaza

Items 1.27-1.29
No testing required.

Item 1.31
Existing chair lift to be replaced.
test all wall , and floor surfaces



Item 1.32
Test suspected materials at lower level rooms for proposed mechanical, plumbing tie-ins for proposed addition.

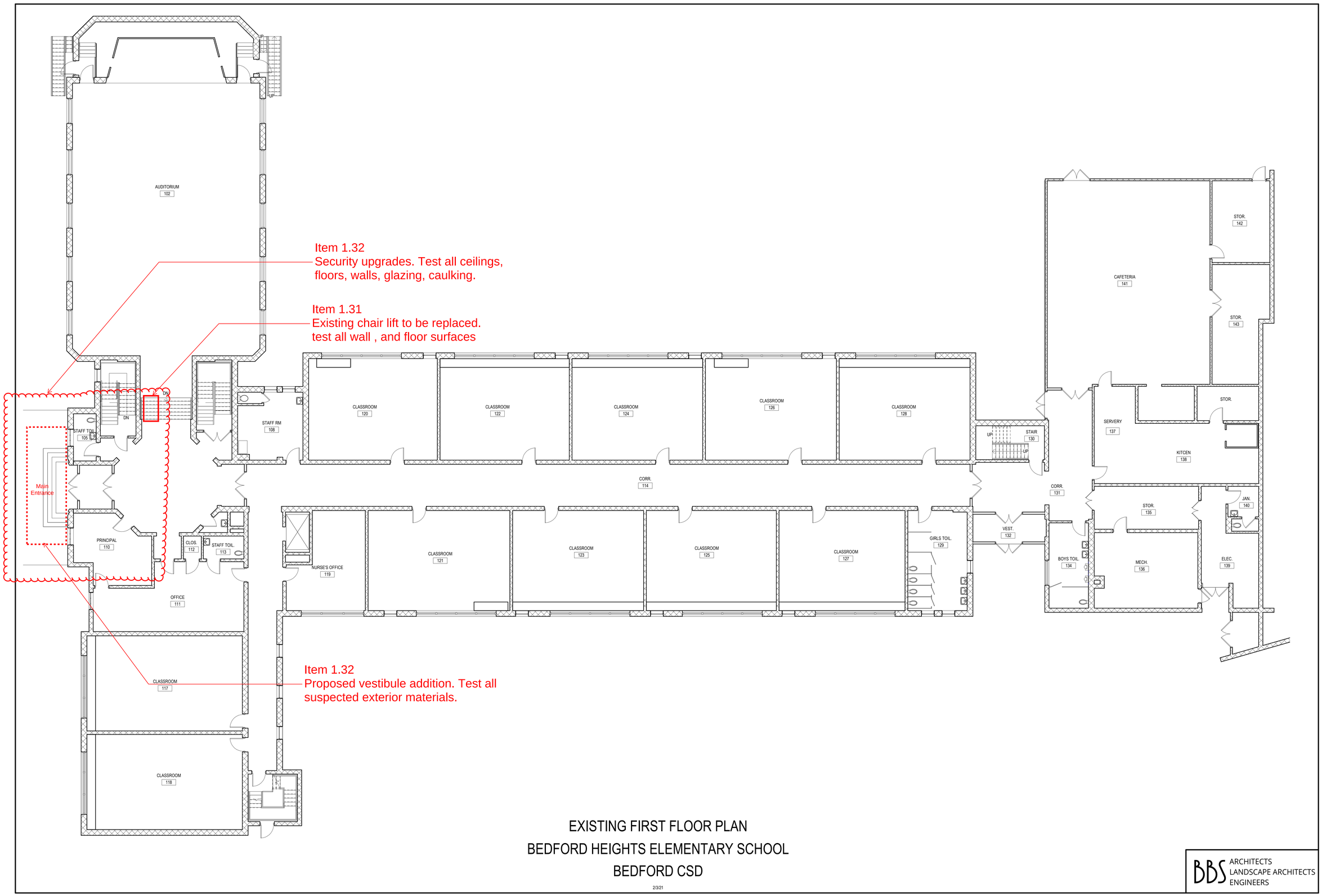
EXISTING BASEMENT PLAN

BEDFORD HEIGHTS ELEMENTARY SCHOOL

BEDFORD CSD

02/03/21

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS



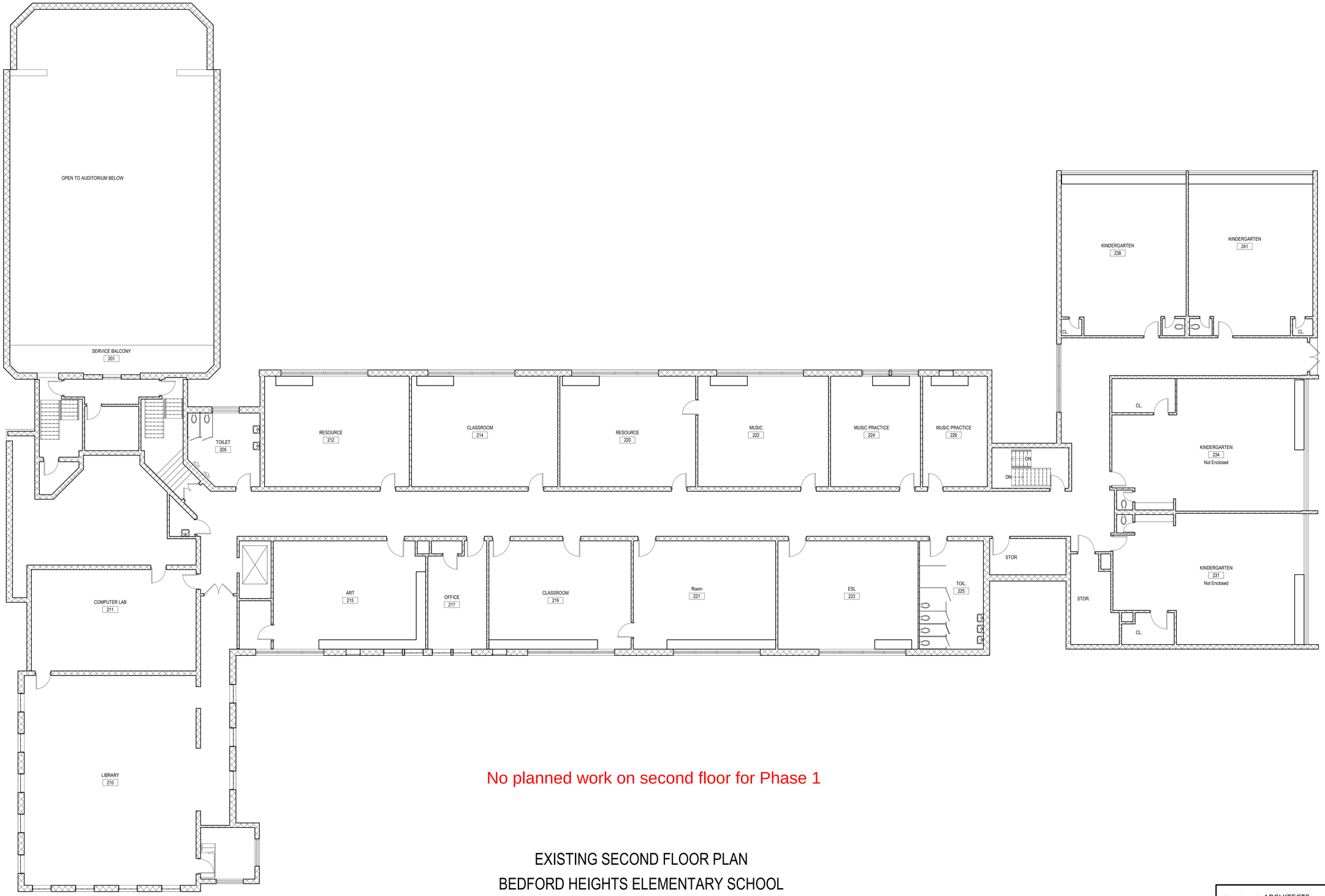
EXISTING FIRST FLOOR PLAN

BEDFORD HEIGHTS ELEMENTARY SCHOOL

BEDFORD CSD

2/3/21

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS



No planned work on second floor for Phase 1

EXISTING SECOND FLOOR PLAN
BEDFORD HEIGHTS ELEMENTARY SCHOOL
BEDFORD CSD

02/03/21

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS

APPENDIX I:
FILE SEARCH

ASBESTOS TRIENNIAL INSPECTION REPORT

for

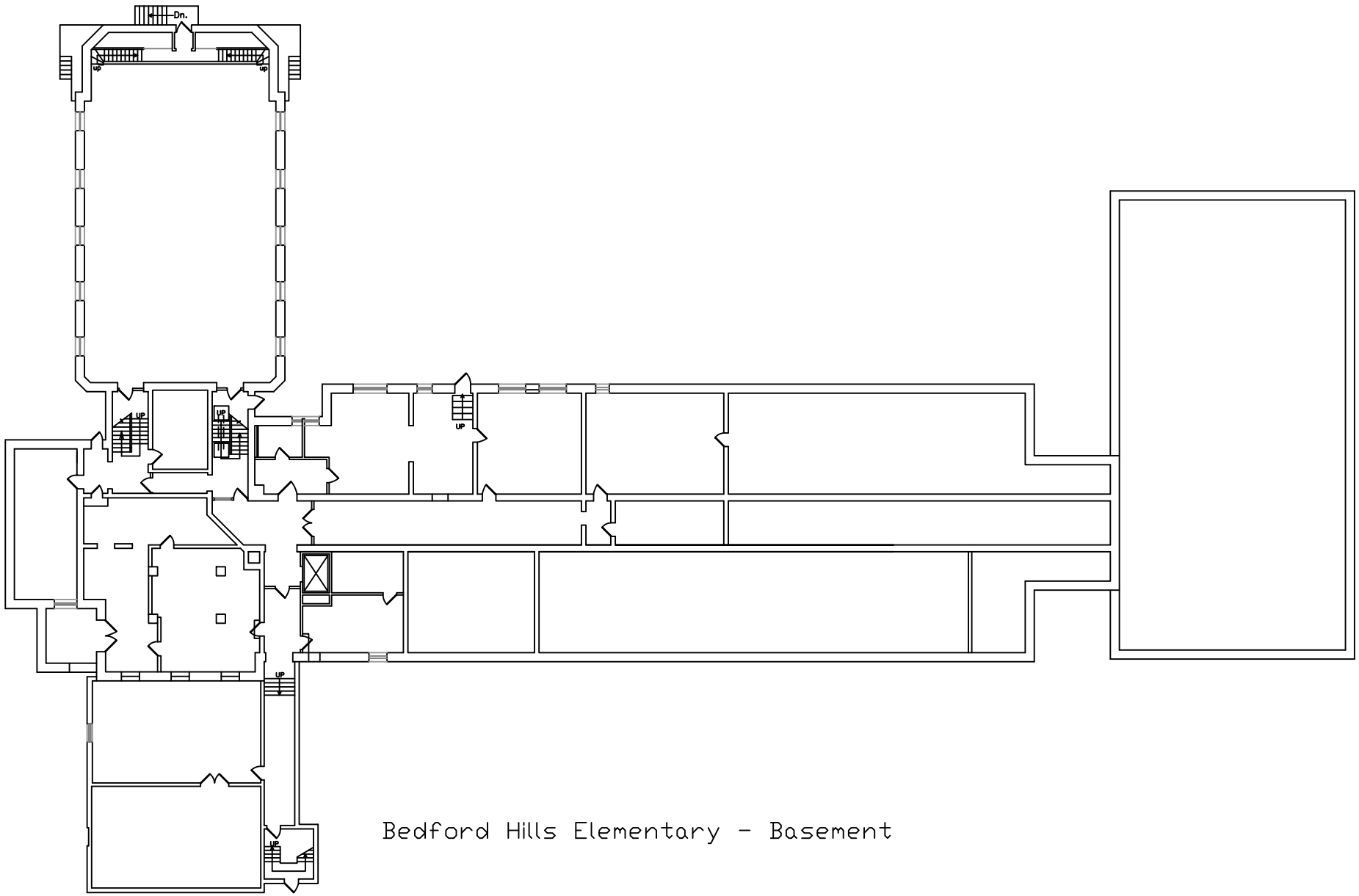
BEDFORD HILLS ELEMENTARY SCHOOL

BEDFORD CENTRAL SCHOOL DISTRICT
Fox Lane Campus
Mount Kisco, New York 10528

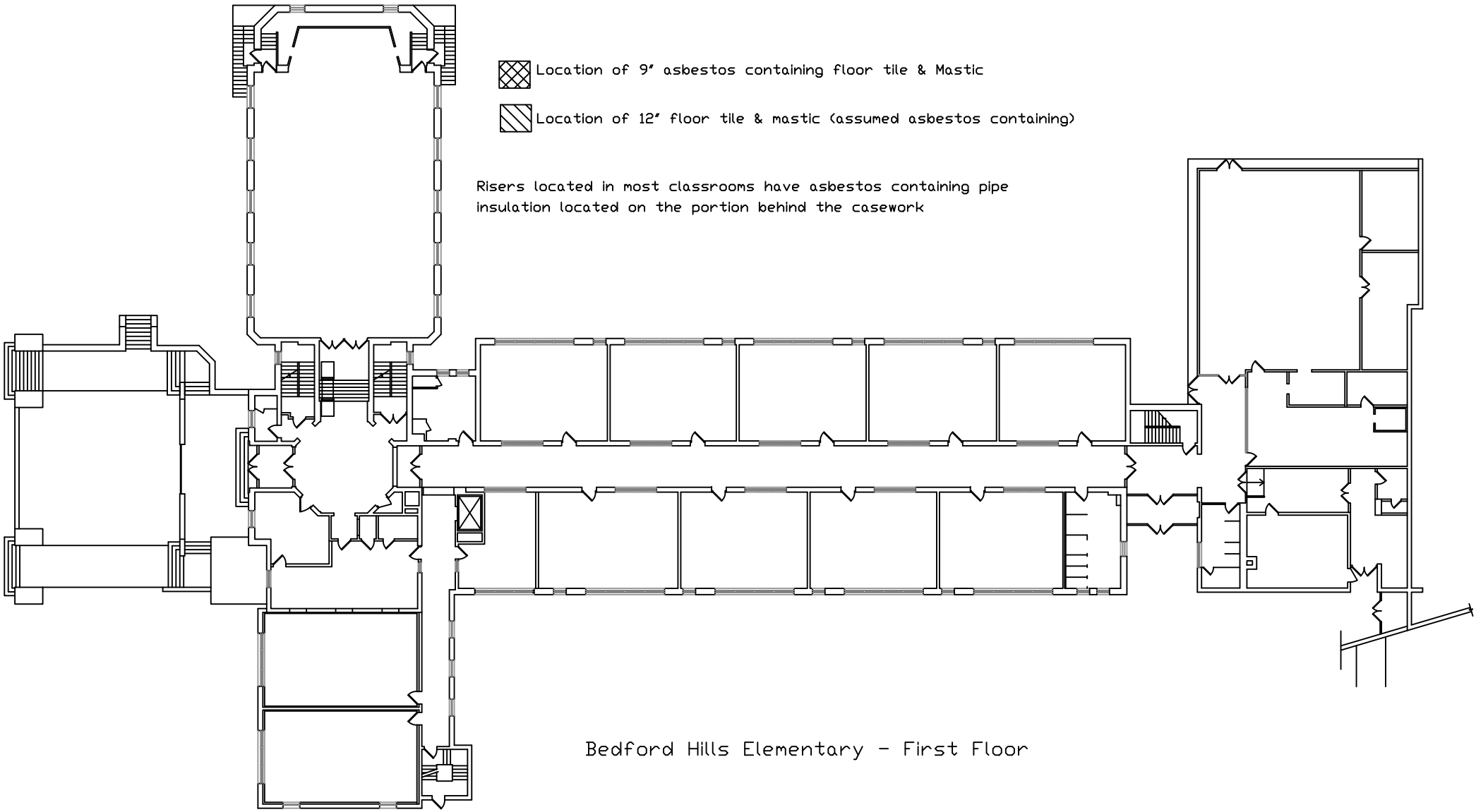
by

S & B ENVIRONMENTAL, LLC
7 Fairchild Road
Newtown, CT. 06470

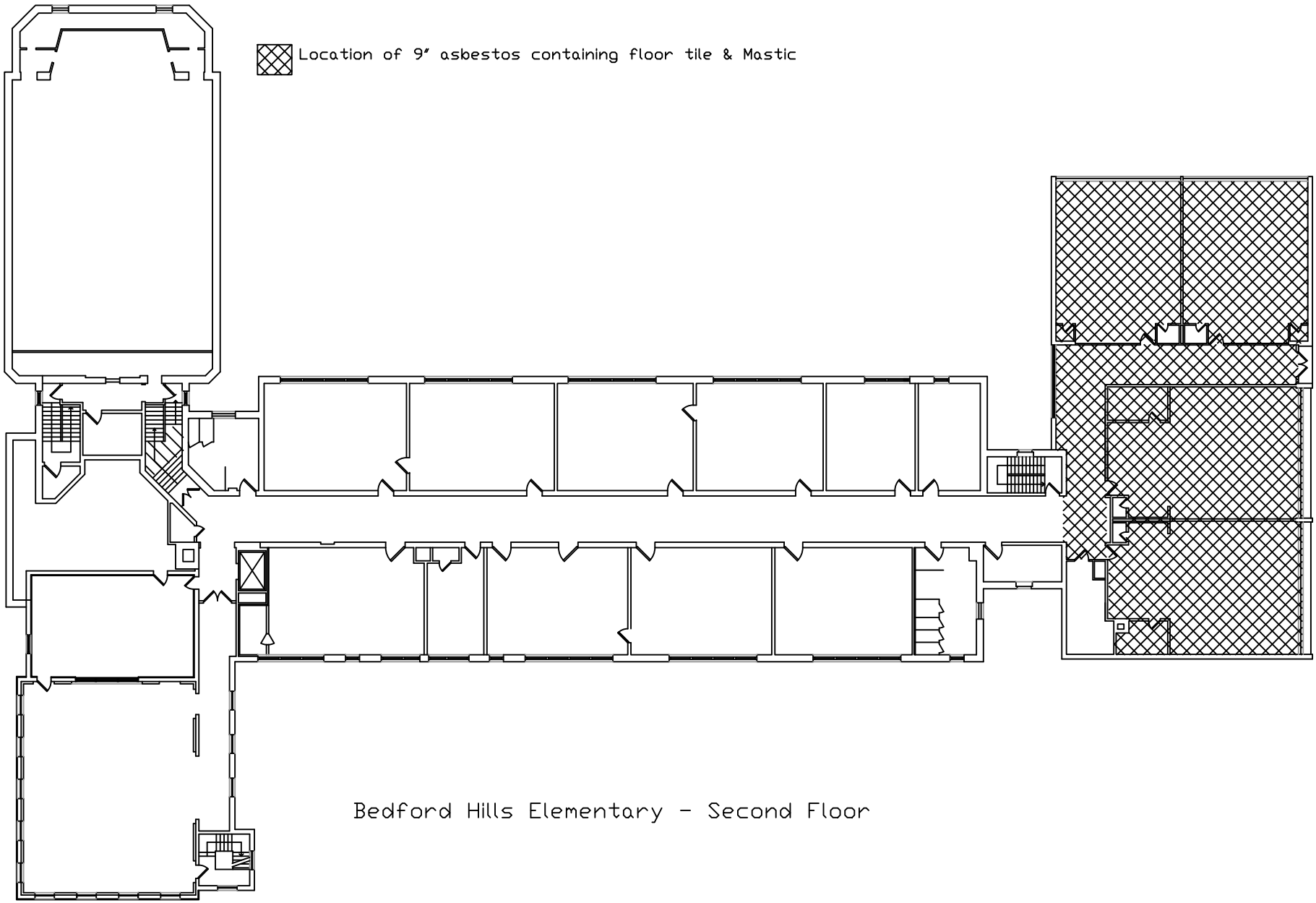
12 May 2019



Bedford Hills Elementary - Basement



Bedford Hills Elementary - First Floor



Bedford Hills Elementary - Second Floor

FINAL REPORT OF ENVIRONMENTAL SERVICES

Performed at:

WEST PATENT ELEMENTARY SCHOOL
SED SURVEY PROJECT
80 WEST PATENT ROAD
BEDFORD HILLS, NY 10507

Prepared for:

BEDFORD CENTRAL SCHOOL DISTRICT
Inspiring and Challenging Our Students

632 South Bedford Road
Bedford, NY 10506

Prepared by:

WSP USA Solutions, Inc.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
Tel. (914) 747-1120

Project No. 31405320.015
Final Submission Date: September 16, 2022

September 16, 2022

Mr. Dennis Rankin
Director of Facilities
Bedford Central School District
632 South Bedford Road
Bedford, NY 10506

Subject: **Final Report of Environmental Services**
SED Survey Project
West Patent Elementary School
80 West Patent Road
Bedford Hills, NY 10507

Dear Mr. Rankin:

WSP USA Solutions, Inc. has completed a material inspection at West Patent Elementary School located at Bedford Hills, NY 10507. The inspection included visual observation, material sampling, and laboratory sample analysis of suspect Asbestos-Containing Materials (ACM), Lead Based Paints (LBP) and Polychlorinated Biphenyls (PCBs) as part of the SED Survey project at the West Patent Elementary School.

The attached report presents descriptions and results of the material sampling procedures and visual analysis. Relevant general project information is provided, followed by our findings, assessments and recommendations. Laboratory analysis data and certifications are provided in the Appendices.

If you have any questions concerning this report or if we may be of further assistance to you, please contact us.

Sincerely,

WSP USA SOLUTIONS, INC.

Steven Eget, PE
Vice President, Earth & Environment Downstate NY Business Line Leader

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Appendices

1.0 EXECUTIVE SUMMARY

WSP USA Solutions, Inc. has performed a material inspection for the presence or absence of Asbestos-Containing Materials (ACM), Lead Based Paints (LBP) and Polychlorinated Biphenyls (PCBs) at the West Patent Elementary School located at Bedford Hills, NY 10507. The intent of this inspection was to screen for ACM, LBP and PCBs that may be impacted during the SED Survey project at the school noted above.

Alex Smolyar, Dmitri Kirnossenko and Josue Garcia of WSP performed this inspection on August 24, 2022. Mr. Smolyar is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert#12-07624) and a licensed New York State EPA as a Lead Risk Assessor (Cert# LBP-R-129050-2). Mr. Kirnossenko is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert#07-01720) and a licensed New York State EPA as a Lead Inspector (Cert# LBP-I-16279-2). Mr. Garcia is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert#01-04292) and a licensed New York State EPA as a Lead Risk Assessor (Cert# LBP-R-6928-2).

The results of the visual inspection and bulk sample analysis determined that the following suspect ACM, LBP and PCB materials may be impacted by the proposed SED Survey project at the school noted above:

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 08/24/2022 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **None**

The following materials **Contain Asbestos as per AHERA Report:**

- **Floor Tiles & Mastic - Not Affected by Current SOW**

Analytical results of the bulk samples collected on 08/24/2022 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Cinderblock Mortar (Gray) - (Interior)
- Interior Brick Mortar (Gray) - (Interior)
- Exterior Brick Mortar (Gray) - (exterior)
- 2’x2’ Ceiling Tile (Gray) - (Interior)
- 2’x4’ Ceiling Tile (Gray) - (Interior)
- Gypsum Board (Gray) - (Interior)
- Joint Compound (White) - (Interior)
- Baseboard (Red) - (Interior)
- Glue to Baseboard (Yellow) - (Interior)
- 12”x12” Floor Tile (Beige) - (Interior)
- 12”x12” Floor Tile (Red) - (Interior)

- Mastic to 12”x12” (Red & Beige) Floor Tile (Black) - (Interior)
- 12”x24” Floor Tile (Gray) - (Interior)
- Mastic to 12”x24” Floor Tile (Gray) - (Interior)
- Interior Window Caulking (Gray) - (Interior)
- Exterior Door Frame Caulking (Gray) - (Exterior)
- Interior Door Frame Caulking (Gray) - (Interior)

B. LEAD-BASED PAINT

Based upon XRF readings, lead has been confirmed to exist in the following tested combinations:

- **None**

Lead was **not detected** in the following tested combinations via XRF readings:

- Gray Paint on Metal Door (Main Lobby)
- Gray Paint on Metal Door Frame (Main Lobby)
- Brown Paint on Vinyl Baseboard (Main Lobby)
- Yellow Paint on Metal Door Frame (Security Office)
- Varnish Paint on Wood Door (Security Office)
- Mural Paint on Cinderblock Wall (Security Office)
- Mural Paint on Cinderblock Wall (Security Office)
- Mural Paint on Cinderblock Wall (Security Office)
- Blue Paint on Gypsum Pipe (Security Office)
- Mural Paint on Metal Radiator (Security Office)
- Yellow Paint on Cinderblock Wall (Hallway)
- Yellow Paint on Gypsum Wall (Hallway)
- Black Paint on Vinyl Baseboard (Hallway)
- Beige Paint on Gypsum Wall (West Doors)
- Red Paint on Metal Door (West Doors)
- Gray Paint on Wood Walkway Ceiling (West Doors)
- Gray Paint on Metal Exterior Door Frame (West Doors)
- Gray Paint on Metal Exterior Door (West Doors)

C. PCB-CONTAINING MATERIAL

Analytical results of the bulk samples collected indicate that the following materials **contain PCB** (greater than 50 PPM):

- None

Analytical results of the bulk samples collected indicate that the following materials **did not contain PCB** (less than 50 PPM):

- Interior Window Caulk (Gray)
- Exterior Door Frame Caulk (Gray)
- Interior Door Frame Caulk (Gray)

2.0 FIELD INSPECTION PROCEDURES AND SAMPLE ANALYSIS METHODS

A. ASBESTOS-CONTAINING MATERIAL

Guidelines used for the inspection were established by the Environmental Protection Agency (EPA) in the Guidance for Controlling Asbestos Containing Materials in Buildings, Office of Pesticides and Toxic Substances, Doc 560/5-85-024, and 40 CFR Part 763, Asbestos Hazard Emergency Response Act (AHERA).

Field information was organized in accordance with the AHERA methodology of homogenous area (HA). During the Inspection, reasonable effort was made to identify all locations and types of ACM materials associated with the scope of work. Sampling has included multiple samples of the same materials chosen at random. However, due to inconsistencies of a manufacturer's processes and the contractor's installation methods, materials of similar construction may contain various amounts of asbestos. Furthermore, some materials that were not originally specified to contain asbestos may in fact contain this mineral. For example, cementitious pipe insulation and plaster were frequently mixed with asbestos at the construction site for ease of application. Locating all asbestos materials can only be definitively achieved by conducting exploratory demolition and sampling every section of pipe insulation, fitting or valve covering, fireproofing, and other suspect ACM.

Bulk samples of suspect ACM are analyzed using polarized light microscopy (PLM) coupled with dispersion staining, as described in 40 CFR Part 763 and the National Emissions Standard for Hazardous Air Pollutants (NESHAPS). NESHAPS is the standard industry protocol for the determination of asbestos in building materials. A suspect material is immersed in a solution of known refractive index and subjected to illumination by polarized light. The color displays that result are compared to a standardized atlas whereby the specific variety of asbestos is determined. It should also be recognized that PLM is primarily a qualitative identification method whereby asbestos percentage, if any, is estimated. While EPA, New York State, and New York City regulations governing ACM consider materials containing greater then 1-percent as asbestos, accurately quantifying asbestos content below 5-percent has been shown to be unreliable.

The New York State Department of Health has recently revised the PLM Stratified Point Counting Method. The March 25th, 2011 method, "Polarized Light Microscopy Methods for Identifying and Quantifying Asbestos in Bulk Samples" can be found as Item 198.1 in the Environmental Laboratory Approval program (ELAP) Certification manual. Whereas the procedure of analysis for bulk samples that fall into the category of "Non-friable Organically Bound" (NOB) can be found in the March 25th 2011 method "Polarized-Light Microscope Method for Identifying and Quantifying Asbestos in Non-Friable Organically Bound Bulk Samples", Item 198.6 in the ELAP Certification Manual. This category includes any sample in a

flexible to rigid asphalt or vinyl matrix (floor tiles, mastic, roofing shingles, roofing felt, etc.). These samples must be "ashed" in a muffle furnace at 480-degrees Celsius (to remove organic matrix), treated with acid (to remove any mineral carbonate), and filtered through a 0.4-micron polycarbonate filter before being analyzed by PLM. The sample must be weighted between each of these steps to track the percent loss of organic matrix.

ELAP has determined that analysis of NOB materials is not reliably performed by PLM. Therefore, if PLM analysis yields results of 1-percent asbestos or less, the result must be confirmed by TEM. For bulk samples that undergo TEM analysis, the March 25th, 2011 method "Transmission Electron Microscope Method for Identifying and Quantitating Asbestos in Non-Friable organically Bound Bulk Samples" must be used and can be found as Item 198.4 in the ELAP Certification Manual. ELAP certified laboratories must include the following statement with their PLM analysis results for each "negative" (1-percent or less asbestos) NOB sample: "Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Before this material can be considered or treated as non-ACM, confirmation must be made by quantitative transmission electron microscopy".

All samples are initially analyzed by Polarized Light Microscopy in accordance with Item 198.1 and 198.6 of the ELAP Certification Manual. Samples which yield a negative PLM result and which are classified as a "non-friable" material, are then re-analyzed utilizing TEM methodology in accordance with Item 198.4 of the ELAP Certification Manual. The laboratory performing both these analysis procedures Atlas Environmental Lab, Corp. located at 255 West 36th Street, New York, NY 10018. The laboratory has received accreditation from the following agencies:

- National Voluntary Laboratory Accreditation Program (Lab Code 500092-0)
- New York State Environmental Laboratory Approval Program (Lab No. 11999)
- American Industrial Hygiene Association Accredited Laboratory (Lab No. 208306)

B. LEAD-BASED PAINT

Painted surfaces within the space equivalents in the scope of work were identified and grouped together by component type, substrate and visible color. In similar fashion, the inspection continued in each space equivalent with the identification of unique combinations of component, substrate and visible color. A random representative area of each unique combination was sampled and tested. For each of these designated components, an area on the component was chosen which represents the paint on that building component. During the inspection, components that are accessible surfaces, friction surfaces, impact surfaces, or have deteriorated paint was identified.

The readings of paint surfaces were taken using Heuresis Pb200i and RMD LPA-1 XRF Lead Paint Spectrum Analyzers. The Heuresis and LPA-1 method of measurement is based on the spectrometric analysis of lead K-shell X-ray fluorescence within a controlled depth of interrogation. The Heuresis and LPA-1 Analyzers uses a Co-57 radioactive source and an advanced, solid-state, room temperature, radiation detector to generate and detect the x-ray fluorescence spectrum of a painted surface. The spectrum is then analyzed by a microprocessor

to eliminate the effects of substrate and other factors such as scattering to allow an accurate determination of the amount of lead on a surface. The Heuresis and LPA-1 automatically analyzes spectrometric data in real time and differentiates the lead signal from the spectrum. The x-ray fluorescence properties are determined through calibration process and are used for automatic substrate correction and calculation of the lead content of a painted surface.

For quality control, the XRF instrument was calibrated using a U.S. Department of Commerce National Institute of Standards and Technology (NIST) Level III 1.0 mg/cm2 lead based paint film. For each calibration, three (3) XRF readings were taken on the paint film. The average of these three (3) readings was then subtracted from the known lead content in the paint film. The difference was compared with an Environmental Protection Agency (EPA)-approved tolerance range. Such calibration procedures were conducted at the start and at the end of the workday

C. POLYCHLORINATED BIPHENYLS (PCBs)

PCBs belong to a broad family of man-made organic chemicals known as chlorinated hydrocarbons. PCBs were domestically manufactured from 1929 until their manufacture was banned in 1979. They have a range of toxicity and vary in consistency from thin, light-colored liquids to yellow or black waxy solids. Due to their non-flammability, chemical stability, high boiling point, and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics, and rubber products; in pigments, dyes, and carbonless copy paper; and many other industrial applications.

Although no longer commercially produced in the United States, PCBs may be present in products and materials produced before the 1979 PCB ban. Products that may contain PCBs include: Transformers and capacitors, Oil used in motors and hydraulic systems, Fluorescent light ballasts, Adhesives and tapes, Caulking, Plastics, etc.

The PCBs used in these products were chemical mixtures made up of a variety of individual chlorinated biphenyl components, known as congeners. Most commercial PCB mixtures are known in the United States by their industrial trade names. The most common trade name is aroclor.

Polychlorinated biphenyls (PCBs) are regulated pursuant to the United States Environmental Protection Agency Code of Federal Regulations (40 CFR Part 761) and the Toxic Substances Control Act (TSCA – 15 U.S.C. 2605). These regulations require certain testing and reporting requirements to determine management, recycling and disposal options for PCBs.

3.0 INSPECTION SCOPE AND MATERIAL ASSESSMENT

The areas inspected for ACM materials that may be impacted by the proposed SED Survey project at the West Patent Elementary School. Locations surveyed include:

- First Floor West Entrance

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 08/24/2022 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **None**

The following materials **Contain Asbestos as per AHERA Report:**

- **Floor Tiles & Mastic - Not Affected by Current SOW**

Analytical results of the bulk samples collected on 08/24/2022 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Cinderblock Mortar (Gray) - (Interior)
- Interior Brick Mortar (Gray) - (Interior)
- Exterior Brick Mortar (Gray) - (exterior)
- 2'x2' Ceiling Tile (Gray) - (Interior)
- 2'x4' Ceiling Tile (Gray) - (Interior)
- Gypsum Board (Gray) - (Interior)
- Joint Compound (White) - (Interior)
- Baseboard (Red) - (Interior)
- Glue to Baseboard (Yellow) - (Interior)
- 12"x12" Floor Tile (Beige) - (Interior)
- 12"x12" Floor Tile (Red) - (Interior)
- Mastic to 12"x12" (Red & Beige) Floor Tile (Black) - (Interior)
- 12"x24" Floor Tile (Gray) - (Interior)
- Mastic to 12"x24" Floor Tile (Gray) - (Interior)
- Interior Window Caulking (Gray) - (Interior)
- Exterior Door Frame Caulking (Gray) - (Exterior)
- Interior Door Frame Caulking (Gray) - (Interior)

D. LEAD-BASED PAINT

Based upon XRF readings, lead has been confirmed to exist in the following tested combinations:

- **None**

Lead was **not detected** in the following tested combinations via XRF readings:

- Gray Paint on Metal Door (Main Lobby)
- Gray Paint on Metal Door Frame (Main Lobby)
- Brown Paint on Vinyl Baseboard (Main Lobby)
- Yellow Paint on Metal Door Frame (Security Office)

- Varnish Paint on Wood Door (Security Office)
- Mural Paint on Cinderblock Wall (Security Office)
- Mural Paint on Cinderblock Wall (Security Office)
- Mural Paint on Cinderblock Wall (Security Office)
- Blue Paint on Gypsum Pipe (Security Office)
- Mural Paint on Metal Radiator (Security Office)
- Yellow Paint on Cinderblock Wall (Hallway)
- Yellow Paint on Gypsum Wall (Hallway)
- Black Paint on Vinyl Baseboard (Hallway)
- Beige Paint on Gypsum Wall (West Doors)
- Red Paint on Metal Door (West Doors)
- Gray Paint on Wood Walkway Ceiling (West Doors)
- Gray Paint on Metal Exterior Door Frame (West Doors)
- Gray Paint on Metal Exterior Door (West Doors)

E. PCB-CONTAINING MATERIAL

Analytical results of the bulk samples collected indicate that the following materials **contain PCB** (greater than 50 PPM):

- **None**

Analytical results of the bulk samples collected indicate that the following materials **did not contain PCB** (less than 50 PPM):

- Interior Window Caulk (Gray)
- Exterior Door Frame Caulk (Gray)
- Interior Door Frame Caulk (Gray)

4.0 INSPECTION RESULTS

A. ASBESTOS-CONTAINING MATERIAL

The asbestos inspection involved a thorough visual examination of all areas that may be impacted by the proposed SED Survey project at the West Patent Elementary School. The following suspect materials were sampled and analyzed for asbestos content by WSP:

4.1 Table 4.1 – Suspect Materials Inspected

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
WSP Sampled on 08/24/22			
A	Interior	Cinderblock Mortar (Gray)	NAD
B	Interior	Interior Brick Mortar (Gray)	NAD

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
C	Exterior	Exterior Brick Mortar (Gray)	NAD
D	Interior	2'x2' Ceiling Tile (Gray)	NAD
E	Interior	2'x4' Ceiling Tile (Gray)	NAD
F	Interior	Gypsum Board (Gray)	NAD
G	Interior	Joint Compound (White)	NAD
H	Interior	Baseboard (Red)	NAD
I	Interior	Glue to Baseboard (Yellow)	NAD
J	Interior	12"x12" Floor Tile (Beige)	NAD
K	Interior	12"x12" Floor Tile (Red)	NAD
L	Interior	Mastic to 12"x12" (Red & Beige) Floor Tile (Black)	NAD
M	Interior	12"x24" Floor Tile (Gray)	NAD
N	Interior	Mastic to 12"x24" Floor Tile (Gray)	NAD
O	Interior	Interior Window Caulking (Gray)	NAD
P	Exterior	Exterior Door Frame Caulking (Gray)	NAD
Q	Interior	Interior Door Frame Caulking (Gray)	NAD
AHERA Report			
-	**Interior**	**Floor Tiles & Mastic - Not Affected by Current SOW**	**ACM**

Bold = Positive for ACM NAD = No Asbestos Detected NA/PS = Not analyzed/ positive sample

4.2 CONDITION AND FRIABLITY ASSESSMENT TABLE

For each inspection conducted, the inspector classifies ACM or Assumed ACM materials by friability and condition. This helps to determine the extent of damage in certain areas as well as the potential for further damage and Asbestos release due to disturbance of the material.

Table 4.2 – Condition and Friability Assessment

Location	Material	Quantity	Friability	Condition
None				

Condition Definitions:
Good: None/Minimal apparent damage to ACM
Fair: Up to 10% localized damage or up to 25% of the entire ACM is damaged
Poor: Over 10% localized damage or over 25% of the entire ACM is damaged

4.3 SAMPLE ANALYSIS TABLE

Laboratory analysis results, in tabular form, are included in Appendix A.

B. LEAD-BASED PAINT

The lead Inspection involved a thorough visual examination of all accessible areas impacted by the proposed SED Survey project at the West Patent Elementary School. The following suspect surfaces were tested for lead content:

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
Previous WSP Report dated 08/24/22						
1	Calibration Check @ 1.0	---	---	---	---	1.0
2	Calibration Check @ 1.0	---	---	---	---	1.0
3	Calibration Check @ 1.0	---	---	---	---	0.9
4	Calibration Check @ 0.0	---	---	---	---	0.0
5	Calibration Check @ 0.0	---	---	---	---	0.1
6	Calibration Check @ 0.0	---	---	---	---	0.1
7	Main Lobby	Door	Gray	Metal	Intact	0.3
8	Main Lobby	Door Frame	Gray	Metal	Intact	-0.1
9	Main Lobby	Baseboard	Brown	Vinyl	Intact	0.0
10	Security Office	Door Frame	Yellow	Metal	Intact	0.1
11	Security Office	Door	Varnish	Wood	Intact	-0.2
12	Security Office	Wall	Mural	Cinderblock	Intact	0.1
13	Security Office	Wall	Mural	Cinderblock	Intact	-0.3
14	Security Office	Wall	Mural	Cinderblock	Intact	0.0
15	Security Office	Pipe	Blue	Gypsum	Intact	-0.1
16	Security Office	Radiator	Mural	Metal	Intact	0.2
17	Hallway	Wall	Yellow	Cinderblock	Intact	0.0
18	Hallway	Wall	Yellow	Gypsum	Intact	0.0
19	Hallway	Baseboard	Black	Vinyl	Intact	0.1
20	West Doors	Wall	Beige	Gypsum	Intact	0.3
21	West Doors	Door	Red	Metal	Intact	-0.1
22	West Doors	Walkway Ceiling	Gray	Wood	Intact	0.0
23	West Doors	Exterior Door Frame	Gray	Metal	Intact	-0.1
24	West Doors	Exterior Door	Gray	Metal	Intact	0.2
25	Calibration Check @ 1.0	---	---	---	---	1.0

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
26	Calibration Check @ 1.0	---	---	---	---	1.0
27	Calibration Check @ 1.0	---	---	---	---	0.9
28	Calibration Check @ 0.0	---	---	---	---	0.0
29	Calibration Check @ 0.0	---	---	---	---	0.1
30	Calibration Check @ 0.0	---	---	---	---	0.1

C. PCB-CONTAINING MATERIAL

The PCB Inspection involved a thorough visual examination of all areas that may be impacted by the proposed SED Survey project at the West Patent Elementary School. The following suspect materials were tested for PCB content:

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	PCB CONTENT (PPM)
A	Security Office	Interior Window Caulk (Gray)	ND
B	Exterior	Exterior Door Frame Caulk (Gray)	0.793
C	Interior	Interior Door Frame Caulk (Gray)	ND

5.0 AREAS NOT ACCESSIBLE

During the inspection the following areas were not accessible:

Spaces within Walls/Floors/Ceilings: No destructive sampling was performed on concealed spaces in walls to access plenum, chases etc. It should be assumed that asbestos containing materials may exist in these spaces. Any suspect materials encountered during work should be sampled for analysis before work continues.

Building Envelope: No destructive sampling was performed on the building envelope. It should be assumed that asbestos, lead and PCB containing materials may exist in these spaces. Any suspect materials encountered during work should be sampled for analysis before work continues.

6.0 CONCLUSIONS AND RECOMMENDATIONS

No ACM, LBP or PCB have been identified in this inspection that may be impacted as part of the proposed SED Survey project at the West Patent Elementary School.

The ACM, LBP & PCB inspection was conducted at the request of Bedford Centra School District for the proposed SED Survey project at the West Patent Elementary School. Any change in the scope of work will require further investigation to accurately classify any additional ACM, LBP or PCBs resulting from the modified or updated scope of work.

7.0 REPORT CERTIFICATIONS

This report, and the supporting data, findings, conclusions, opinions, and recommendations it contains represent the result of WSP's efforts for the environmental inspection work for the West Patent Elementary School, SED Survey project.

Opinions and recommendations presented in this report apply to site conditions and features as they existed at the time of WSP's site visits, and those reasonably foreseeable. They cannot necessarily apply to conditions and features of which WSP is unaware and has not had the opportunity to evaluate.

The conclusions presented in this report are professional opinions solely upon WSP's visual observations of accessible areas, laboratory test data, and current regulatory requirements. These conclusions are intended exclusively for the purpose stated herein and the site indicated for the project indicated.

Prepared by:

Josue Garcia
NYS DOL Inspector

Reviewed by:

Steven Eget, PE
Vice President

APPENDIX A:
ASBESTOS SAMPLE ANALYSIS RESULTS IN TABULAR FORM

APPENDIX A
SAMPLE ANALYSIS RESULTS IN TABULAR FORM
WEST PATENT ELEMENTARY SCHOOL
SED SURVEY PROJECT
80 WEST PATENT ROAD
BEDFORD HILLS, NY 10507

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
WSP Sampled on 08/24/2022					
A	01	1st Floor, Office	Cinderblock Mortar (Gray)	NAD	N/A
	02	1st Floor, Hallway		NAD	N/A
B	03	1st Floor, Vestibule	Interior Brick Mortar (Gray)	NAD	N/A
	04	1st Floor, Hallway		NAD	N/A
C	05	Exterior	Exterior Brick Mortar (Gray)	NAD	N/A
	06	Exterior		NAD	N/A
D	07	1st Floor, Vestibule	2'x2' Ceiling Tile (Gray)	NAD	NAD
	08	1st Floor, Vestibule		NAD	NAD
E	09	1st Floor, Office	2'x4' Ceiling Tile (Gray)	NAD	NAD
	10	1st Floor, Hallway		NAD	NAD
F	11	1st Floor, Vestibule	Gypsum Board (Gray)	NAD	N/A
	12	1st Floor, Vestibule		NAD	N/A
G	13	1st Floor, Vestibule	Joint Compound (White)	NAD	N/A
	14	1st Floor, Vestibule		NAD	N/A
H	15	1st Floor, Hallway	Baseboard (Red)	NAD	NAD
	16	1st Floor, Vestibule		NAD	NAD
I	17	1st Floor, Hallway	Glue to Baseboard (Yellow)	NAD	NAD
	18	1st Floor, Vestibule		NAD	NAD
J	19	1st Floor, Hallway	12"x12" Floor Tile (Beige)	NAD	NAD
	20	1st Floor, Hallway		NAD	NAD
K	21	1st Floor, Hallway	12"x12" Floor Tile (Red)	NAD	NAD
	22	1st Floor, Hallway		NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
L	23	1st Floor, Hallway	Mastic to 12”x12” (Red & Beige) Floor Tile (Black)	NAD	NAD
	24	1st Floor, Hallway		NAD	NAD
M	25	1st Floor, Security Office	12”x24” Floor Tile (Gray)	NAD	NAD
	26	1st Floor, Security Office		NAD	NAD
N	27	1st Floor, Security Office	Mastic to 12”x24” Floor Tile (Gray)	NAD	NAD
	28	1st Floor, Security Office		NAD	NAD
O	29	1st Floor, Security Office	Interior Window Caulking (Gray)	NAD	NAD
	30	1st Floor, Security Office		NAD	NAD
P	31	Exterior	Exterior Door Frame Caulking (Gray)	NAD	NAD
	32	Exterior		NAD	NAD
Q	33	1st Floor, Vestibule	Interior Door Frame Caulking (Gray)	NAD	NAD
	34	1st Floor, Hallway		NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

APPENDIX B:
ASBESTOS BULK SAMPLE FIELD DATA SHEETS WITH CHAIN OF CUSODY & LABORATORY RESULTS

Atlas Environmental Lab, Corp.
255 West 36th Street, Suite# 1503
New York, NY 10018
Phone:(212) 563-0400 Fax:(212) 563-0401
www.atlasenvironmentallab.com

Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford School District / 31405320.015
Project Address: West Patent ES
Collected By: Client
Work Area: Throughout Interior / Exterior

AEL ID# BK0822419.REV
Date Received: 8/26/2022
PLM Date Analyzed: 8/27/2022
TEM Date Analyzed: 8/29/2022
Report Date: 8/29/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
A-1	BK0822419-1	1st FL Office - Cinder Block Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
A-2	BK0822419-2	1st FL Hallway - Cinder Block Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
B-3	BK0822419-3	1st FL Vestibule - Int Brick Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
B-4	BK0822419-4	1st FL Hallway - Int Brick Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
C-5	BK0822419-5	Exterior - Brick Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
C-6	BK0822419-6	Exterior - Brick Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
D-7	BK0822419-7	1st FL Vestibule - 2'x2' Ceiling Tile (Grey)	Tan, Homogeneous, Non-Fibrous	13.6	62.7	23.7	0%	100%	**NAD** Inconclusive	**NAD**		X	X
D-8	BK0822419-8	1st FL Vestibule - 2'x2' Ceiling Tile (Grey)	Tan, Homogeneous, Non-Fibrous	14.5	56.0	29.5	0%	100%	**NAD** Inconclusive	**NAD**		X	X
E-9	BK0822419-9	1st FL Office - 2'x4' Ceiling Tile (Grey)	Tan, Homogeneous, Non-Fibrous	15.2	81.6	3.2	0%	100%	**NAD** Inconclusive	**NAD**		X	X
E-10	BK0822419-10	1st FL Hallway - 2'x4' Ceiling Tile (Grey)	Tan, Homogeneous, Non-Fibrous	20.2	79.1	0.7	0%	100%	**NAD** Inconclusive	**NAD**		X	X

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Client: WSP
Project Name/No.: Bedford School District / 31405320.015
Project Address: West Patent ES
Collected By: Client
Work Area: Throughout Interior / Exterior

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Report Date: 8/29/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
F-11	BK0822419-11	1st FL Vestibule - Gypsum Board (Grey)	White, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	**NAD**		X		
F-12	BK0822419-12	1st FL Vestibule - Gypsum Board (Grey)	White, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	**NAD**		X		
G-13	BK0822419-13	1st FL Vestibule - Joint Compound (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
G-14	BK0822419-14	1st FL Vestibule - Joint Compound (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
H-15	BK0822419-15	1st FL Hallway - Baseboard (Red)	Red, Homogeneous, Non-Fibrous	56.1	2.1	41.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X
H-16	BK0822419-16	1st FL Vestibule - Baseboard (Red)	Red, Homogeneous, Non-Fibrous	58.5	8.9	32.7	0%	100%	**NAD** Inconclusive	**NAD**		X	X
I-17	BK0822419-17	1st FL Hallway - Glue to Baseboard (Yellow)	Yellow, Homogeneous, Non-Fibrous	52.6	19.7	27.6	0%	100%	**NAD** Inconclusive	**NAD**		X	X
I-18	BK0822419-18	1st FL Vestibule - Glue to Baseboard (Yellow)	Yellow, Homogeneous, Non-Fibrous	48.6	24.9	26.5	0%	100%	**NAD** Inconclusive	**NAD**		X	X
J-19	BK0822419-19	1st FL Hallway - 12x12 Beige Floor Tile	Beige, Homogeneous, Non-Fibrous	20.2	50.0	29.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X
J-20	BK0822419-20	1st FL Hallway - 12x12 Beige Floor Tile	Beige, Homogeneous, Non-Fibrous	19.0	44.0	37.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X

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Project Address: West Patent ES
Collected By: Client
Work Area: Throughout Interior / Exterior

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Report Date: 8/29/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
K-21	BK0822419-21	1st FL Hallway - 12x12 Red Floor Tile	Red, Homogeneous, Non-Fibrous	16.9	9.0	74.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
K-22	BK0822419-22	1st FL Hallway - 12x12 Red Floor Tile	Red, Homogeneous, Non-Fibrous	18.5	35.2	46.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X
L-23	BK0822419-23	1st FL Hallway - Mastic to 12x12 (Red+Beige) Floor Tile (Black)	Black, Homogeneous, Non-Fibrous	55.8	23.4	20.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X
L-24	BK0822419-24	1st FL Hallway - Mastic to 12x12 (Red+Beige) Floor Tile (Black)	Black, Homogeneous, Non-Fibrous	69.5	23.6	6.9	0%	100%	**NAD** Inconclusive	**NAD**		X	X
M-25	BK0822419-25	Security Office - 12"x24" Floor Tile (Grey)	Grey, Homogeneous, Non-Fibrous	49.6	3.2	47.2	0%	100%	**NAD** Inconclusive	**NAD**		X	X
M-26	BK0822419-26	Security Office - 12"x24" Floor Tile (Grey)	Grey, Homogeneous, Non-Fibrous	50.0	4.6	45.4	0%	100%	**NAD** Inconclusive	**NAD**		X	X
N-27	BK0822419-27	Security Office - Mastic to 12"x24" Floor Tile (Grey)	Grey, Homogeneous, Non-Fibrous	64.3	27.4	8.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X
N-28	BK0822419-28	Security Office - Mastic to 12"x24" Floor Tile (Grey)	Grey, Homogeneous, Non-Fibrous	65.4	28.1	6.5	0%	100%	**NAD** Inconclusive	**NAD**		X	X
O-29	BK0822419-29	Security Office - Interior Window Caulking (Grey)	Grey, Homogeneous, Non-Fibrous	73.8	4.5	21.7	0%	100%	**NAD** Inconclusive	**NAD**		X	X
O-30	BK0822419-30	Security Office - Interior Window Caulking (Grey)	Grey, Homogeneous, Non-Fibrous	73.6	3.8	22.7	0%	100%	**NAD** Inconclusive	**NAD**		X	X

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Client: WSP
Project Name/No.: Bedford School District / 31405320.015
Project Address: West Patent ES
Collected By: Client
Work Area: Throughout Interior / Exterior

AEL ID# BK0822419.REV
Date Received: 8/26/2022
PLM Date Analyzed: 8/27/2022
TEM Date Analyzed: 8/29/2022
Report Date: 8/29/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	AII %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
P-31	BK0822419-31	Exterior - Exterior Door Frame Caulking (Grey)	Grey, Homogeneous, Non-Fibrous	71.2	3.3	25.5	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
P-32	BK0822419-32	Exterior - Exterior Door Frame Caulking (Grey)	Grey, Homogeneous, Non-Fibrous	68.5	1.8	29.7	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
Q-33	BK0822419-33	1st FL Vestibule - Interior Door Frame Caulking (Grey)	Grey, Homogeneous, Non-Fibrous	72.1	1.5	26.4	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
Q-34	BK0822419-34	1st FL Hallway - Interior Door Frame Caulking (Grey)	Grey, Homogeneous, Non-Fibrous	36.6	1.7	61.7	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**

JR

Quantitative Analysis (Semi/Full):Bulk Asbestos Analysis-PLM by EPA 600/M4-82-020 per 40 CFR or ELAP198.1 (friable) and 198.6 (NOB) samples for New York.

NAD=no asbestos detected, NA/PS=Not Analyzed/Positive Stop, Trace=<1%,FBGL=Fiberglass, CELL=Cellulose,CHRY=Chrysotile,Amo=Amosite,CRO=Crocidolite,ANTH=Anthophylite, TRE=Tremolite, ACT=Actinolite, NA=not applicable.

PLM is not consistently reliable in detecting Asbestos in floor coverings and similar non friable organically bound materials. NAD or Trace results by PLM are inconclusive.

TEM is currently the only method that can be used to determine if this material can be considered or treated as non asbestos containing in NY State.

All samples were prepared and analyzed in accordance with the EPA "TEM Method for Identifying and Quantifying Asbestos in Non-Fibrous Organically Bound Bulk Samples" ELAP 198.4".

ORG%=Ashed Organic%, AII= Acid Insoluble Inorganic%, ASI= Acid Soluble Inorganic%

This "Summary of Analytical Results "shall not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, ELAP or any agency of the U.S Government. The results relate only to the items tested. This report may not be reproduced, except in full, without the written approval of AEL .Atlas Environmental lab did not collect the analyzed samples and thus accepts no liability with regard to their collection and/or maintenance . AEL relies on client's data. The liability of Atlas Environmental Lab corp with respect to the services charged, shall in no event exceed the amount of the invoice.

NYS-ELAP#11999, NVLAP Lab Code: 500092-0, NJ ID: NY034 "ELCP on NJ won't apply to TEM", CT ID:PH-0154

PLM Analyst: RO TEM Analyst: VR Approved by:

BLCOE22419

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.015
CLIENT: Bedford School District
PROJECT SITE: West Patent ES
Project Manager: A.Smolyar

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/24/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

WSP
TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: Penn One, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. ☑ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
A	1	1st Fl office	Cinder Block Mortar		
↓	2	Hallway	(gray)		
B	3	Vestibule	Int. Brick Mortar		
↓	4	Hallway	(gray)		
C	5	Exterior	Brick Mortar (gray)		
↓	6	↓	↓		
d	7	1st Fl Vestibule	2'x2' Ceiling tile		
↓	8	↓	(gray)		
e	9	office	2'x4' Ceiling tile		
↓	10	Hallway	(gray)		
f	11	Vestibule	Gypsum Board (gray)		
↓	12	↓	↓		

CHAIN OF CUSTODY

Relinquished by: (print) A.Smolyar	(Sign)	8/26/22	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM	Relinquished by: (print)	(Sign)		AM/PM
Received by: (print)	(Sign)	/ /	AM/PM	Received by: (print)	(Sign)	8/26/22	17:10 AM/PM	Received by: (print)	(Sign)		AM/PM

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

08/29/22

BLC82249

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.015
CLIENT: Bedford School District
PROJECT SITE: West Patent ES
Project Manager: A.Smolyar

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/24/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

WSP
TELEPHONE NO. : (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: Penn One, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. ☑ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
G	13	1st Fl Vestibule	Joint Compound (white)		
↓	14	↓	↓		
H	15	Hallway	Baseboard (red)		
↓	16	Vestibule	↓		
I	17	Hallway	glue to baseboard (yellow)		
↓	18	Vestibule			
J	19	Hallway	12 x 12 beige floor tile		
↓	20		↓		
K	21		12 x 12 red floor tile		
↓	22		↓		
L	23		MASTIC to 12 x 12 (red + beige)		
↓	24		Floor tile (black)		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
A. Smolyar		8/26/22									
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
						8/26/22					

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

BK0822419

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.015
CLIENT: Bedford School District
PROJECT SITE: West Patent ES
Project Manager: A.Smolyar

LOCATION(S) SURVEYED: Throughout Interior/Exterior
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/24/22
Inspector(s): J Garcia, D Kirnossenko, A Smolyar

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ADDRESS: Penn One, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. ☑ 72 HR.

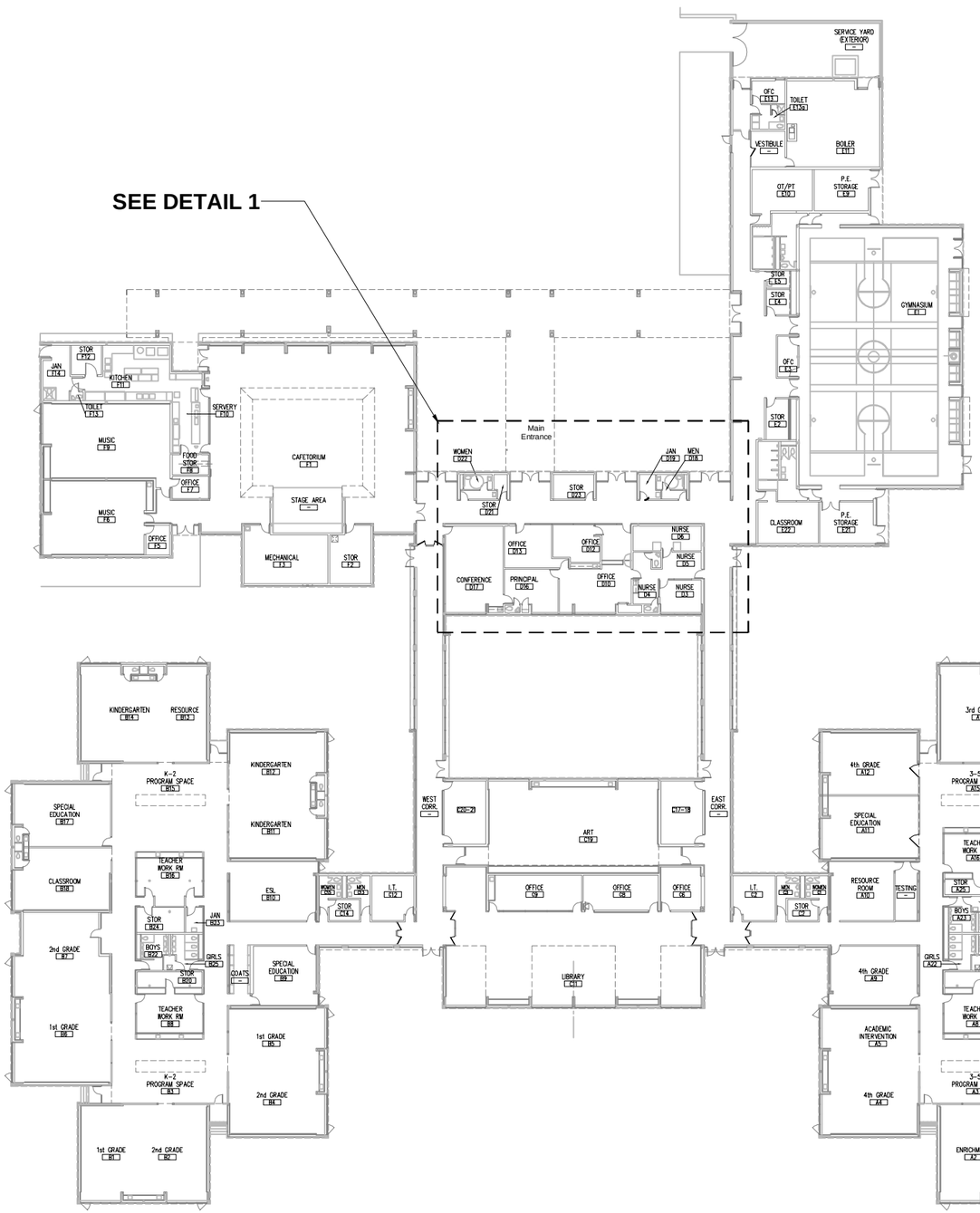
HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
M	25	Security Office	12"x24" Floor tile (gray)		
↓	26	↓	↓		
N	27		Mastic to 12"x24" Floor		
↓	28	↓	tile (gray)		
O	29	Security Office	Interior Window Caulking		
↓	30	↓	(gray)		
P	31	Exterior	Exterior Door frame		
↓	32	↓	Caulking (gray)		
Q	33	1st Fl Vestibule	Interior Door Frame		
↓	34	↓ Hallway	caulking (gray)		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
A. Smolyar		8/26/22									
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
				JM		8/26/22 17:40					

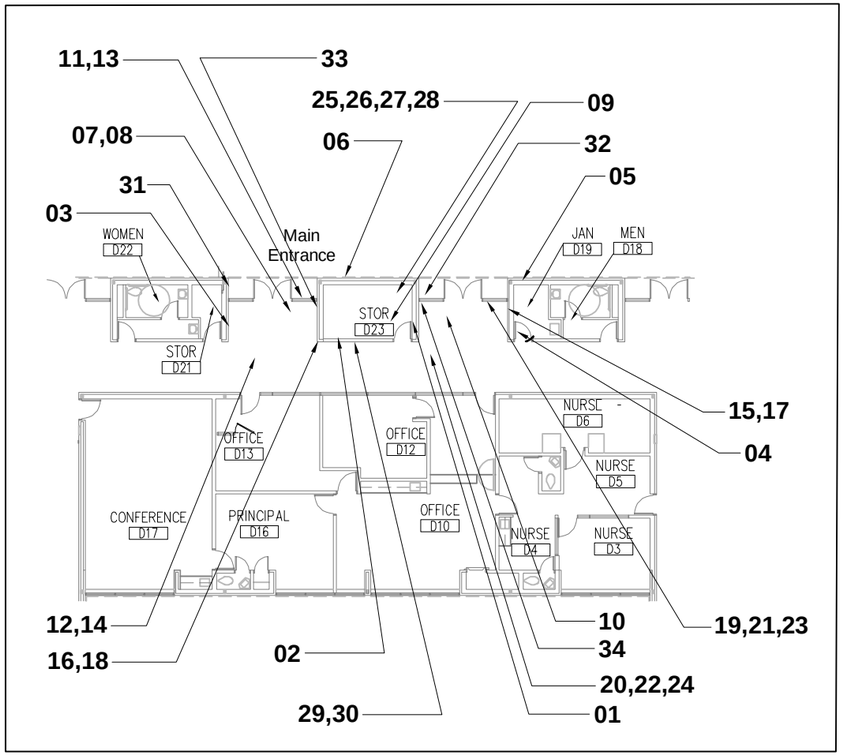
NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

APPENDIX C:
ASBESTOS BULK SAMPLE LOCATION DRAWINGS



FIRST FLOOR PLAN

SCALE: NOT TO SCALE



DETAIL 1

SCALE: NOT TO SCALE

BEDFORD CENTRAL SCHOOL DISTRICT

Every Single Student, Every Single Day

BEDFORD CENTRAL SCHOOL DISTRICT

FOX LANE CAMPUS
MOUNT KISCO, NY 10528

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL: 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

WEST PATENT ELEMENTARY SCHOOL
80 WEST PATENT ROAD
BEDFORD HILLS, NY 10507

DRAWING TITLE

BULK SAMPLE LOCATIONS
FIRST FLOOR PLAN

DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV.:J.GARCIA	DATE: 09/14/2022
CERTIFICATE NO. 01-04292	DRAWING NUMBER:
CHECKED BY: A.SMOLYAR	BSL001
	DRAWING NUMBER: 1 OF 1

CONSULTANTS PROJECT 31405320.015

APPENDIX D:
ASBESTOS CONTAINING MATERIALS LOCATION DRAWINGS
[NOT APPLICABLE]

APPENDIX E:
LEAD XRF SHOT RESULTS

XRF CALIBRATION CHECK FORM

PAGE 1 OF 1

PROJ. NO.:		DATE:	8/24/22
PROJECT NAME:		INSPECTOR NAME:	A. Smolyar
CLIENT:	Bedford CSD	INSPECTOR SIGNATURE:	[signature]
SITE:	West Patent ES	PROJ. MANAGER:	

LOUIS BERGER a WSP USA Company
TELEPHONE # : (212) 612-7900
FAX #: (212) 425-1618
ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014

XRF MAKE/MODEL: RMD LPA-1 (Serial#3675) Heuresis Pb200i (Serial#2150)

LLW#:

JOB#:

NOTES:

CALIBRATION CHECK – PRIOR TO LEAVING OFFICE

1.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 12:00	TEST #	1	2	3	
	XRF READING	1.0	1.0	0.9	

CALIBRATION CHECK – PRIOR TO LEAVING OFFICE

0.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 12:15	TEST #	4	5	6	
	XRF READING	0.0	0.1	0.1	

CALIBRATION CHECK – FIELD-START

1.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 13:00	TEST #	25	26	27	
	XRF READING	1.0	1.0	0.9	

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

0.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 15:08	TEST #	28	29	30	
	XRF READING	0.0	0.1	0.1	

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

______ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ______	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

______ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ______	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

______ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ______	TEST #				
	XRF READING				

XRF LEAD-BASED PAINT TESTING DATA SHEET/CHAIN OF CUSTODY

PAGE 1 OF 1

PROJECT NO.:
CLIENT: Bedford CSD
INSPECTOR(S): A. Smolyar
PROJ. MANAGER:

PROJECT NAME:
PROJECT LOCATION: West Patent ES
INSPECTION DATE: 8/24/22

SPACE CHARACTERISTICS:
FLOOR #: _____ ROOM #: _____ ROOM NAME: _____

NOTES:

SAMPLE #	SUBSTRATE	COMPONENT DISCRIPTION: COLOR	CONDITION [I / F / P]	COMPONENT	WALL/SIDE DESIGN.	SIDE [L/C/R]	HEIGHT [L/M/U]	COMPONENT REPLICANT	QUANTITY (IF POSITIVE) [SF]	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	XRF READING [mg/cm²]
7	(M) PL S C CB PG CR B W V CT G FG OTHER:	gray		DR	A B C D RM CTR FL CL						Main Lobby	0.3
8	(M) PL S C CB PG CR B W V CT G FG OTHER:	↓		DF	A B C D RM CTR FL CL							0.1
9	M PL S C CB PG CR B W (V) CT G FG OTHER:	Brown		BB	A B C D RM CTR FL CL							0.0
10	(M) PL S C CB PG CR B W V CT G FG OTHER:	Yellow		DF	A B C D RM CTR FL CL						SEC. OFFICE	0.1
11	M PL S C CB PG CR B (W) V CT G FG OTHER:	Varnish		Door	A B C D RM CTR FL CL							0.2
12	M PL S C (CB) PG CR B W V CT G FG OTHER:	Mural		WALL	(A) B C D RM CTR FL CL							0.1
13	M PL S C (CB) PG CR B W V CT G FG OTHER:	↓		↓	A (B) C D RM CTR FL CL							0.3
14	M PL S C (CB) PG CR B W V CT G FG OTHER:	↓		↓	A B (C) D RM CTR FL CL							0.0
15	(M) PL S C CB PG CR B W V CT G FG OTHER:	Blue		Pipe	(A) B C D RM CTR FL CL							0.1
16	(M) PL S C CB PG CR B W V CT G FG OTHER:	Mural		radiator	A B C (D) RM CTR FL CL							0.2
17	M PL S C (CB) PG CR B W V CT G FG OTHER:	yellow		WALL	A B C D RM CTR FL CL						Hallway	0.0
18	M PL S C CB PG CR B W V CT G FG OTHER: gyp	↓		WALL	A B C D RM CTR FL CL						↓	0.0
19	M PL S C CB PG CR B W (V) CT G FG OTHER:	Black		BB	A B C D RM CTR FL CL						↓	0.1
20	M PL S C CB PG CR B W V CT G FG OTHER: gyp	Beige		WALL	A B C D RM CTR FL CL						West DOORS	0.3
21	(M) PL S C CB PG CR B W V CT G FG OTHER:	Red		DOOR	A B C D RM CTR FL CL							0.1
22	M PL S C CB PG CR B (W) V CT G FG OTHER:	gray		walkway ceiling	A B C D RM CTR FL CL							0.0
23	M PL S C CB PG CR B W V CT G FG OTHER:	↓		Ex. DF	A B C D RM CTR FL CL							0.1
24	M PL S C CB PG CR B W V CT G FG OTHER:	↓		Ex Door	A B C D RM CTR FL CL							0.2
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							

Side: Left/Center/Right; Height: Lower/Middle/Upper; Substrate: M: Metal; PL: Plaster; S: Sheetrock; C: Concrete; CB: Cinder Block; CR: Sinks, Water Closets, etc.; CT: Ceramic Tile; PG: Porcelain-glazed Block; B: Brick; W: Wood; V: Vinyl; FG: Fiberglass; G: Glass ; Condition: I = Intact; F = Fair; P = Poor; Initial Result: P = Positive; N = Negative;

APPENDIX F:
PCB BULK SAMPLE FIELD DATA SHEETS WITH CHAIN OF CUSTODY & LABORATORY RESULTS

Technical Report

prepared for:

WSP USA (New York, NY)
One Penn Plaza, 2nd Floor
New York NY, 10119
Attention: Alexander Smolyar

Report Date: 09/06/2022
Client Project ID: 31405320.015 West Patent ES
York Project (SDG) No.: 22H1652

CT Cert. No. PH-0723 New Jersey Cert. No. CT005 and NY037 New York Cert. Nos. 10854 and 12058 PA Cert. No. 68-04440

120 RESEARCH DRIVE STRATFORD, CT 06615 ■ 132-02 89th AVENUE RICHMOND HILL, NY 11418
www.YORKLAB.com (203) 325-1371 FAX (203) 357-0166 ClientServices@yorklab.com

Report Date: 09/06/2022
Client Project ID: 31405320.015 West Patent ES
York Project (SDG) No.: 22H1652

WSP USA (New York, NY)
One Penn Plaza, 2nd Floor
New York NY, 10119
Attention: Alexander Smolyar

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on August 29, 2022 and listed below. The project was identified as your project: **31405320.015 West Patent ES**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Sample and Analysis Qualifiers section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the Sample and Data Qualifiers Relating to This Work Order section of this report and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
22H1652-01	A-1/2/3	Caulk	08/24/2022	08/29/2022
22H1652-02	B-4/5/6	Caulk	08/24/2022	08/29/2022
22H1652-03	C-7/8/9	Caulk	08/24/2022	08/29/2022

General Notes for York Project (SDG) No.: 22H1652

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All analyses conducted met method or Laboratory SOP requirements. See the Sample and Data Qualifiers Section for further information.
6. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
7. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.
8. Analyses conducted at York Analytical Laboratories, Inc. Stratford, CT are indicated by NY Cert. No. 10854; those conducted at York Analytical Laboratories, Inc., Richmond Hill, NY are indicated by NY Cert. No. 12058.

Approved By: 

Date: 09/06/2022

Cassie L. Mosher
Laboratory Manager

Sample Information

Client Sample ID: A-1/2/3 **York Sample ID:** 22H1652-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1652	31405320.015 West Patent ES	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB) **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.325	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:57	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.325	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:57	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.325	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:57	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.325	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:57	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.325	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:57	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.325	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:57	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.325	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 19:57	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.325	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,NJDEP	09/05/2022 19:57	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.325	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,NJDEP	09/05/2022 19:57	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.325	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 19:57	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*78.5 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*91.0 %*	*30-140*

Sample Information

Client Sample ID: B-4/5/6 **York Sample ID:** 22H1652-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1652	31405320.015 West Patent ES	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB) **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 20:10	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 20:10	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03 NELAC-NY10854,CTDOH,NJDEP	09/05/2022 20:10	BJ

Sample Information

Client Sample ID: B-4/5/6 **York Sample ID:** 22H1652-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1652	31405320.015 West Patent ES	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
53469-21-9	Aroclor 1242	ND		mg/kg	0.424	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 20:10	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.424	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 20:10	BJ
11097-69-1	**Aroclor 1254**	**0.793**		mg/kg	0.424	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 20:10	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.424	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 20:10	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.424	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 20:10	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.424	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 20:10	BJ
1336-36-3	*** Total PCBs**	**0.793**		mg/kg	0.424	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 20:10	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*89.5 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*100 %*	*30-140*

Sample Information

Client Sample ID: C-7/8/9 **York Sample ID:** 22H1652-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1652	31405320.015 West Patent ES	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 20:24	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 20:24	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 20:24	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 20:24	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 20:24	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 20:24	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	09/02/2022 09:03	09/05/2022 20:24	BJ

Sample Information

Client Sample ID: C-7/8/9 **York Sample ID:** 22H1652-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22H1652	31405320.015 West Patent ES	Caulk	August 24, 2022 3:00 pm	08/29/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
37324-23-5	Aroclor 1262	ND		mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 20:24	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	09/02/2022 09:03	09/05/2022 20:24	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.410	1	EPA 8082A Certifications:	09/02/2022 09:03	09/05/2022 20:24	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*87.5 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*101 %*	*30-140*

Analytical Batch Summary

Batch ID: BI20099 **Preparation Method:** EPA 3550C **Prepared By:** KEO

YORK Sample ID	Client Sample ID	Preparation Date
22H1652-01	A-1/2/3	09/02/22
22H1652-02	B-4/5/6	09/02/22
22H1652-03	C-7/8/9	09/02/22
BI20099-BLK1	Blank	09/02/22
BI20099-BS1	LCS	09/02/22
BI20099-BSD1	LCS Dup	09/02/22

Polychlorinated Biphenyls by GC/ECD - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BI20099 - EPA 3550C											
Blank (BI20099-BLK1)								Prepared: 09/02/2022 Analyzed: 09/05/2022			
Aroclor 1016	ND	0.455	mg/kg								
Aroclor 1221	ND	0.455	"								
Aroclor 1232	ND	0.455	"								
Aroclor 1242	ND	0.455	"								
Aroclor 1248	ND	0.455	"								
Aroclor 1254	ND	0.455	"								
Aroclor 1260	ND	0.455	"								
Aroclor 1262	ND	0.455	"								
Aroclor 1268	ND	0.455	"								
Total PCBs	ND	0.455	"								
Surrogate: Tetrachloro-m-xylene	*1.65*		*"*	*1.82*		*90.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*1.69*		*"*	*1.82*		*93.0*	*30-140*				
LCS (BI20099-BS1)								Prepared: 09/02/2022 Analyzed: 09/05/2022			
Aroclor 1016	7.97	0.455	mg/kg	9.09		87.6	40-130				
Aroclor 1260	8.40	0.455	"	9.09		92.4	40-130				
Surrogate: Tetrachloro-m-xylene	*1.75*		*"*	*1.82*		*96.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*1.93*		*"*	*1.82*		*106*	*30-140*				
LCS Dup (BI20099-BSD1)								Prepared: 09/02/2022 Analyzed: 09/05/2022			
Aroclor 1016	7.12	0.455	mg/kg	9.09		78.3	40-130		11.2	25	
Aroclor 1260	7.37	0.455	"	9.09		81.1	40-130		13.1	25	
Surrogate: Tetrachloro-m-xylene	*1.54*		*"*	*1.82*		*84.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*1.58*		*"*	*1.82*		*87.0*	*30-140*				
Batch Y2I0605 - BI20097											
Aroclor Reference (Y2I0605-ARC1)								Prepared & Analyzed: 09/05/2022			
Surrogate: Tetrachloro-m-xylene	*0.211*		*ug/mL*	*0.200*		*106*					
Surrogate: Decachlorobiphenyl	*0.210*		*"*	*0.200*		*105*					

Sample and Data Qualifiers Relating to This Work Order

Definitions and Other Explanations

*	Analyte is not certified or the state of the samples origination does not offer certification for the Analyte.
ND	NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
LOQ	LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence. This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon NELAC 2009 Standards and applies to all analyses.
LOD	LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.
MDL	METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.
Reported to	This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two. For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the LOD/MDL, with values between the LOD/MDL and the LOQ being "J" flagged as estimated results.

For analyses by EPA SW-846-8270D, the Limit of Quantitation (LOQ) reported for benzidine is based upon the lowest standard used for calibration and is not a verified LOQ due to this compound's propensity for oxidative losses during extraction/concentration procedures and non-reproducible chromatographic performance.

2241652

PCB SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 1 OF 1

WSP PROJ #: 31405320.015
CLIENT: Bedford School District
Project Site: West Patent ES
Project Manager: A. Smolyar

LOCATION(S) SURVEYED Int. / Ext.
PROPOSED PROJECT: Capital Project 2022
DATE(S) OF INSPECTION: 8/24/22
Inspector(s) J. Garcia, D. Hrnostenco, A. Smolyar

WSP
TELEPHONE NO. : (212) 612-7900 **FAX NO.: (212) 363-4341**
ADDRESS: 96 Morton Street, 8 Floor, New York, NY 10014

RESULTS TO: Alexander.smolyar@wsp

TURNAROUND TIME:
☐48 HR ☐72 H R ☐96 HR ☑120 HR

LAB SAMPLE NO.	HA	SAMPLE NO.	MATERIAL DESCRIPTION	SAMPLE LOCATION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
	A	1	Interior Window Caulk	Security office		
	↓	2	(gray)	↓		
	↓	3	↓	↓		
	B	4	Exterior Door Frame	Exterior		
	↓	5	Caulk (gray)	↓		
	↓	6	↓	↓		
	C	7	Interior Door Frame	1st Fl Vestibule		
	↓	8	Caulk (gray)	↓ Hallway		
	↓	9	↓	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)			Relinquished by: (print)	(Sign)			Relinquished by: (print)	(Sign)		
A. Smolyar		8/26/22	AM/PM		Ivan B	8/29/22 1531	AM/PM	I. B	Ivan B	8/29/22 1845	AM/PM
Received by: (print)	(Sign)	8/29/22 955	AM/PM	Received by: (print) I. B			AM/PM	Received by: (print)	(Sign)	8/29/22	AM/PM

23.2 C

LAB INSTRUCTIONS: create one (1) composite sample of each homogeneous material from equal mass portions (± 5%) of the three (3) sub-samples for extraction and analysis via EPA Method 8082 and report the Arochlors listed (Arochlor 1016, Arochlor 1221, Arochlor 1232, Arochlor 1242, Arochlor 1248, Arochlor 1254, Arochlor 1260). The laboratory shall target a PCB detection limit of 1 ppm

APPENDIX G:
COMPANY LICENSE, PERSONAL CERTIFICATIONS AND LABORATORY ACCREDITATIONS

New York State – Department of Labor
Division of Safety and Health
License and Certificate Unit
State Campus, Building 12
Albany, NY 12240

ASBESTOS HANDLING LICENSE

WSP USA Solutions Inc.
4th Floor
One Penn Plaza

New York, NY 10119

FILE NUMBER: 19-132876
LICENSE NUMBER: 132876
LICENSE CLASS: RESTRICTED
DATE OF ISSUE: 03/31/2022
EXPIRATION DATE: 03/31/2023

Duly Authorized Representative – Craig Napolitano:

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Amy Phillips, Director
For the Commissioner of Labor

SH 432 (8/12)

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2023
Issued April 01, 2022

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MS. JACKIE DARVISH
ATLAS ENVIRONMENTAL LABS CORP
255 W 36TH STREET SUITE 1503
NEW YORK, NY 10018

NY Lab Id No: 11999

is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:

Miscellaneous

Asbestos in Friable Material	Item 198.1 of Manual
	EPA 600/M4/82/020
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)
Asbestos in Non-Friable Material-TEM	Item 198.4 of Manual
Asbestos-Vermiculite-Containing Material	Item 198.8 of Manual
Lead in Dust Wipes	EPA 7000B
Lead in Paint	EPA 7000B

Sample Preparation Methods

EPA 3050B

Serial No.: 64911

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Atlas Environmental Lab (Asbestos in Bulk)
255 W 36th Street Suite #1503
New York, NY 10018
Ms. Jackie Darvish
Phone: 212-563-0400 Fax: 212-563-0401
Email: jdarvish@atlasenvironmentallab.com
http://www.atlasenvironmentallab.com

ASBESTOS FIBER ANALYSIS — NVLAP LAB CODE 500092-0

Bulk Asbestos Analysis

Code	*Description*
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

Code	*Description*
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

For the National Voluntary Laboratory Accreditation Program

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 500092-0

Atlas Environmental Lab (Asbestos in Bulk)

New York, NY

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2021-10-01 through 2022-09-30

Effective Dates

For the National Voluntary Laboratory Accreditation Program

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

Atlas Environmental Lab

255 W 36th Street, Suite 1503, New York, NY 10018

Laboratory ID: LAP-208306

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA LAP), LLC accreditation to the ISO/IEC 17025:2017 international standard, General Requirements for the Competence of Testing and Calibration Laboratories in the following:

LABORATORY ACCREDITATION PROGRAMS

☑	**INDUSTRIAL HYGIENE**	Accreditation Expires: August 01, 2023
☑	**ENVIRONMENTAL LEAD**	Accreditation Expires: August 01, 2023
☑	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires: August 01, 2023
☐	**FOOD**	Accreditation Expires:
☐	**UNIQUE SCOPES**	Accreditation Expires:

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached Scope of Accreditation. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2017 and AIHA LAP, LLC requirements. This certificate is not valid without the attached Scope of Accreditation. Please review the AIHA LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

Cheryl O. Morton

Cheryl O Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision19.1: 07/28/2021

Date Issued: 07/28/2021

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2023
Issued April 01, 2022

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. ROBERT Q. BRADLEY
YORK ANALYTICAL LABORATORIES INC
120 RESEARCH DRIVE
STRATFORD, CT 06615

NY Lab Id No: 10854

is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards (2016) for the category ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved analytes are listed below:

Polychlorinated Biphenyls

Aroclor 1016 (PCB-1016)	EPA 8082A
Aroclor 1016 (PCB-1016) in Oil	EPA 8082A
Aroclor 1221 (PCB-1221)	EPA 8082A
Aroclor 1221 (PCB-1221) in Oil	EPA 8082A
Aroclor 1232 (PCB-1232)	EPA 8082A
Aroclor 1232 (PCB-1232) in Oil	EPA 8082A
Aroclor 1242 (PCB-1242)	EPA 8082A
Aroclor 1242 (PCB-1242) in Oil	EPA 8082A
Aroclor 1248 (PCB-1248)	EPA 8082A
Aroclor 1248 (PCB-1248) in Oil	EPA 8082A
Aroclor 1254 (PCB-1254)	EPA 8082A
Aroclor 1254 (PCB-1254) in Oil	EPA 8082A
Aroclor 1260 (PCB-1260)	EPA 8082A
Aroclor 1260 (PCB-1260) in Oil	EPA 8082A
Aroclor 1262 (PCB-1262)	EPA 8082A
Aroclor 1262 (PCB-1262) in Oil	EPA 8082A
Aroclor 1268 (PCB-1268)	EPA 8082A
Aroclor 1268 (PCB-1268) in Oil	EPA 8082A

Polynuclear Aromatic Hydrocarbons

Acenaphthene	EPA 8270D
	EPA 8270E
Acenaphthylene	EPA 8270D

Serial No.: 65074

01213 006064102 47

NEW YORK STATE OF OPPORTUNITY. Department of Labor

ALEXANDER SMOLYAR

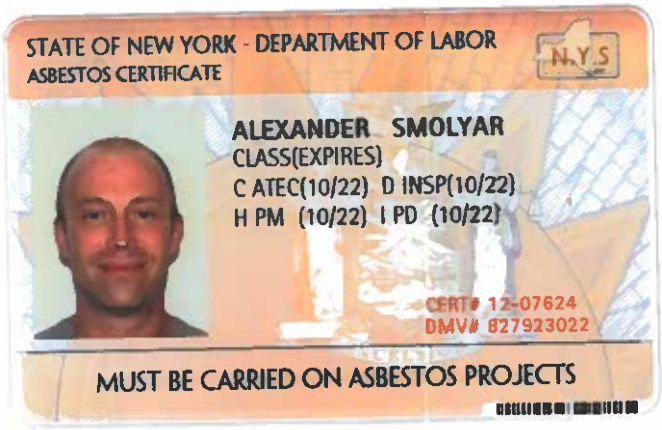
C/O LOUIS BERGER 96 MORTON ST, 8TH FL
NEW YORK NY 10014

Enclosed is your new card.

NYS Department of Labor

The Department of Labor is happy to provide this improved card. We welcome your comments: nysdol@labor.ny.gov or call (518) 457-2735

YOUR NEW CARD



United States Environmental Protection Agency

This is to certify that

Alexander Smolyar

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Risk Assessor

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires March 13, 2025

LBP-R-129050-2

Certification #

November 23, 2021

Issued On

Ben Conetta, Chief

Chemicals and Multimedia Programs Branch

01213 005960614 55

NEW YORK STATE OF OPPORTUNITY. Department of Labor

DMITRI KIRNOSSENKO

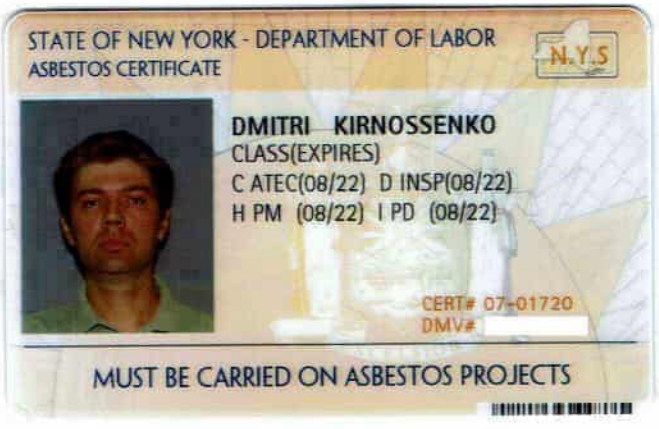
C/O LOUIS BERGER 96 MORTON ST 8TH FL
NEW YORK NY 10014

Enclosed is your new card.

NYS Department of Labor

The Department of Labor is happy to provide this improved card. We welcome your comments: nysdol@labor.ny.gov or call (518) 457-2735

YOUR NEW CARD



United States Environmental Protection Agency

This is to certify that

Dmitri Kirnossenko

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Inspector

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires October 01, 2023

LBP-I-16279-2

Certification #

June 19, 2020

Issued On

Ben Conetta, Chief

Chemicals and Multimedia Programs Branch

STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE

N.Y.S.

JOSUE GARCIA
CLASS(EXPIRES)
C ATEC(08/22) D INSP(08/22)
H PM (08/22) I PD (08/22)

CERT# 01-04282
DMV# 815004194

MUST BE CARRIED ON ASBESTOS PROJECTS

United States Environmental Protection Agency

This is to certify that

Josue Garcia

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Risk Assessor

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires April 09, 2023

LBP-R-6928-2
Certification #

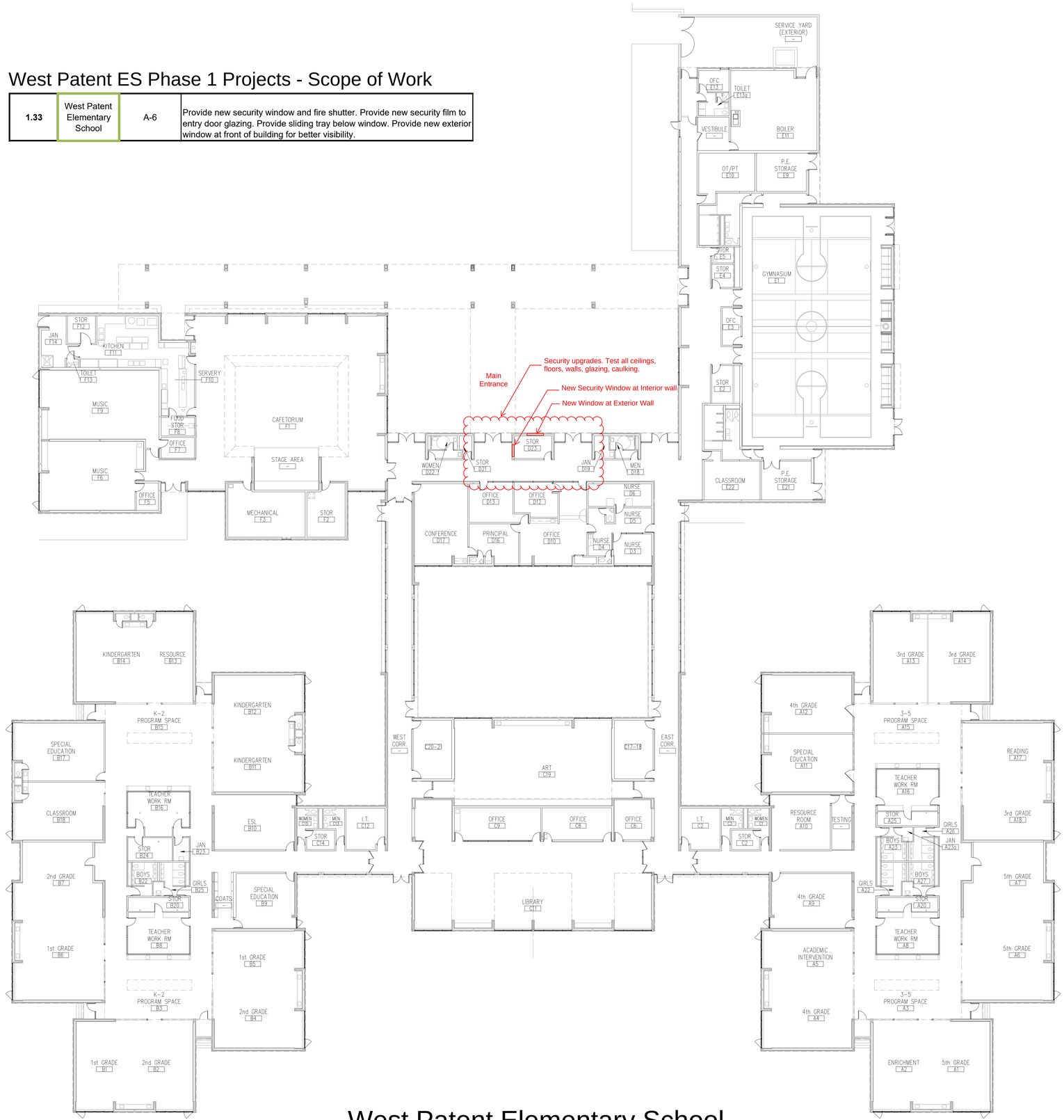
January 28, 2020
Issued On

Susan Schulz, Acting Chief
Chemicals and Multimedia Programs Branch

APPENDIX H:
SCOPE OF WORK DRAWINGS

West Patent ES Phase 1 Projects - Scope of Work

1.33	West Patent Elementary School	A-6	Provide new security window and fire shutter. Provide new security film to entry door glazing. Provide sliding tray below window. Provide new exterior window at front of building for better visibility.



West Patent Elementary School

Building Constructed 1969 - No additions

APPENDIX I:
FILE SEARCH

ASBESTOS TRIENNIAL INSPECTION REPORT

for

WEST PATENT ELEMENTARY SCHOOL

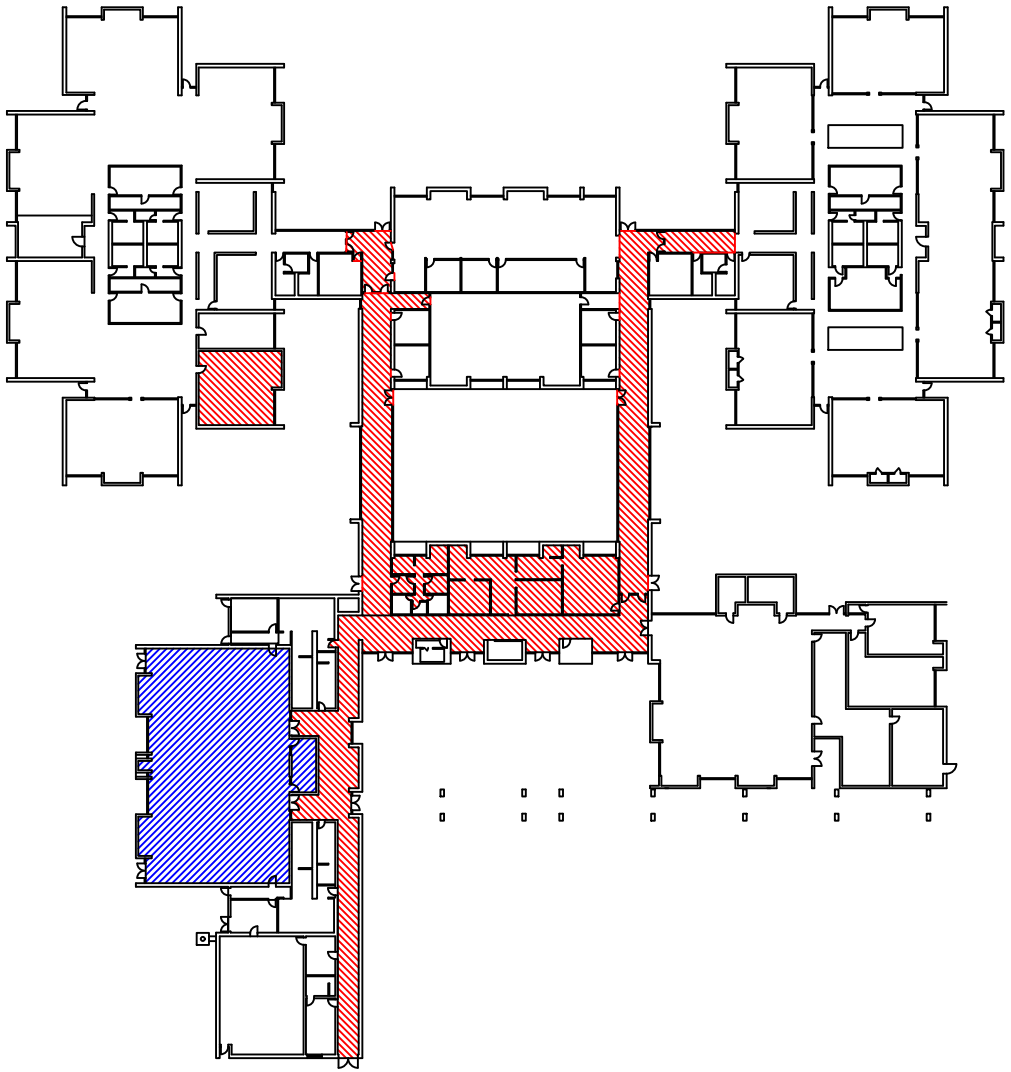
BEDFORD CENTRAL SCHOOL DISTRICT
Fox Lane Campus
Mount Kisco, New York 10528

by

S & B ENVIRONMENTAL, LLC
7 Fairchild Road
Newtown, CT. 06470

12 May 2019

West Patent Elementary School
First Floor



9” asbestos containing floor tile & mastic

12” floor tile with presumed asbestos mastic beneath

FINAL REPORT OF ENVIRONMENTAL SERVICES

Performed at:

BEDFORD VILLAGE ELEMENTARY SCHOOL
SED SURVEY PROJECT
45 COURT ROAD
BEDFORD, NY 10506

Prepared for:

BEDFORD CENTRAL SCHOOL DISTRICT

Inspiring and Challenging Our Students

632 South Bedford Road
Bedford, NY 10506

Prepared by:

WSP USA Solutions, Inc.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
Tel. (914) 747-1120

Project No. 31405320.010
Final Submission Date: September 27, 2022

September 27, 2022

Mr. Dennis Rankin
Director of Facilities
Bedford Central School District
632 South Bedford Road
Bedford, NY 10506

Subject: **Final Report of Environmental Services**
SED Survey Project
Bedford Village Elementary School
45 Court Road
Bedford, NY 10506

Dear Mr. Rankin:

WSP USA Solutions, Inc. has completed a material inspection at Bedford Village Elementary School located at 45 Court Road, Bedford, NY 10506. The inspection included visual observation, material sampling, and laboratory sample analysis of suspect Asbestos-Containing Materials (ACM), Lead Based Paints (LBP) and Polychlorinated Biphenyls (PCBs) as part of the SED Survey project at the Bedford Hill Elementary School.

The attached report presents descriptions and results of the material sampling procedures and visual analysis. Relevant general project information is provided, followed by our findings, assessments and recommendations. Laboratory analysis data and certifications are provided in the Appendices.

If you have any questions concerning this report or if we may be of further assistance to you, please contact us.

Sincerely,

WSP USA SOLUTIONS, INC.

Steven Eget, PE
Vice President, Earth & Environment Downstate NY Business Line Leader

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

WSP USA Solutions, Inc. has performed a material inspection for the presence or absence of Asbestos-Containing Materials (ACM), Lead Based Paints (LBP) and Polychlorinated Biphenyls (PCBs) at the Bedford Village Elementary School located at 45 Court Road, Bedford, NY 10506. The intent of this inspection was to screen for ACM, LBP and PCBs that may be impacted during the SED Survey project at the school noted above.

Jordan Wong and Josue Garcia of WSP performed this inspection on August 30, 2022. Mr. Wong is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert#09-09397) and a licensed New York State EPA as a Lead Risk Assessor (Cert# LBP-R-I183144-2). Mr. Garcia is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert#01-04292) and a licensed New York State EPA as a Lead Risk Assessor (Cert# LBP-R-6928-2).

The results of the visual inspection and bulk sample analysis determined that the following suspect ACM, LBP and PCB materials may be impacted by the proposed SED Survey project at the school noted above:

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 08/30/2022 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **None**

The following materials **Contain Asbestos as per AHERA Report:**

- **Floor Tiles and Mastic - Not Affected by Current SOW**

Analytical results of the bulk samples collected on 08/30/2022 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Wall Plaster (White) - (Interior)
- Wall Plaster (Brown) - (Interior)
- Cinderblock Wall Mortar (Gray) - (Interior)
- Brown Glazed Block Mortar (Gray) - (Interior)
- Tan Glazed Block Mortar (Gray) - (Interior)
- Interior Brick Mortar (Gray) - (Interior)
- Gypsum Board (Gray) - (Interior)
- Joint Compound (White) - (Interior)
- Wall Paper (White) - (Interior)
- Laminated Flooring Glue/Leveling Compound (Gray) - (Interior)
- Mastic Associated with Brown Cove Base Molding (Tan) - (Interior)
- Cove Base Molding (Brown) - (Interior)
- 2’x2’ Fissured Ceiling Tile (White) - (Interior)

- 2'x2' Pinhole Ceiling Tile (White) - (Interior)
- 2'x4' Fissured Ceiling Tile (White) - (Interior)
- 1'x1' Fissured Glue on Ceiling Tile (White) - (Interior)
- Glue Associated with 1'x1' Ceiling Tile (Tan) - (Interior)
- Exterior Brick Mortar (Red) - (Exterior)
- Exterior Textured Paint on Wood (White) - (Exterior)
- Exterior Floor Expansion Joint Insulation (Black) - (Exterior)
- Exterior Floor Expansion Joint Caulking (Gray) - (Exterior)

B. LEAD-BASED PAINT

Based upon XRF readings, lead has been confirmed to exist in the following tested combinations:

- **Brown Paint on Glazed Block Wall (Corridor 62)**
- **Blue Paint on Concrete Wall Strip (Corridor 14)**
- **Brown Paint on Glazed Block Wall (Corridor 14)**
- **Light Blue Paint on Compressed Board Wall Board (Room 78)**
- **White Paint on Wood Door Frame (Corridor 62)**
- **White Paint on Wood Ext. Door Frame (Corridor 62)**
- **White Paint on Wood Exterior Wall (Corridor 62)**
- **White Paint on Brick Exterior Wall (Corridor 62)**
- **Black Paint on Metal Exterior Column (Corridor 62)**

Lead was **not detected** in the following tested combinations via XRF readings:

- White Paint on Plaster Wall (Room 64)
- Brown Paint on Gypsum Wall (Room 64)
- White Paint on Cinderblock Wall (Corridor 62)
- White Paint on Wood Wall Trim (Corridor 62)
- White Paint on Gypsum Wall (Corridor 62)
- Light Blue Paint on Cinderblock Wall (Corridor 14)
- White Paint on Gypsum Wall (Art Room 17)
- Light Green Paint on Gypsum Wall (Room 15)
- Light Blue Paint on Plaster Wall (Room 78)
- Light Blue Paint on Brick Wall (Corridor 14B)
- Light Blue Paint on Gypsum Wall (Corridor 14B)
- Tan Paint on Gypsum Wall (Classroom 01)
- Light Blue Paint on Wall Paper Wall (Room 21)
- Beige Paint on Gypsum Wall (Room 23)
- Beige Paint on Cinderblock Wall (Room 28)
- Light Blue Paint on Gypsum Wall (Room 24)
- Tan Paint on Gypsum Wall (Room 24)
- Blue Paint on Gypsum Wall (Dining Room 54)

- Light Blue Paint on Brick Wall (Corridor 149)
- Light Blue Paint on Plaster Wall (Main Office)
- Beige Paint on Plaster Wall (Corridor 62)
- Green Paint on Wood Door (Corridor 62)
- Back Paint on Metal Exterior Handrail (Corridor 62)
- White Paint on Wood Interior Window Wall Frame (Corridor 62)
- White Paint on Wood Radiator Cover (Corridor 62)
- Off White Paint on Plaster Wall (Conf. 63)

C. PCB-CONTAINING MATERIAL

Analytical results of the bulk samples collected indicate that the following materials **contain PCB** (greater than 50 PPM):

- **None**

Analytical results of the bulk samples collected indicate that the following materials **did not contain PCB** (less than 50 PPM):

- Exterior Floor Expansion Joint Caulking (Gray) – First floor Main Entrance

2.0 FIELD INSPECTION PROCEDURES AND SAMPLE ANALYSIS METHODS

A. ASBESTOS-CONTAINING MATERIAL

Guidelines used for the inspection were established by the Environmental Protection Agency (EPA) in the Guidance for Controlling Asbestos Containing Materials in Buildings, Office of Pesticides and Toxic Substances, Doc 560/5-85-024, and 40 CFR Part 763, Asbestos Hazard Emergency Response Act (AHERA).

Field information was organized in accordance with the AHERA methodology of homogenous area (HA). During the Inspection, reasonable effort was made to identify all locations and types of ACM materials associated with the scope of work. Sampling has included multiple samples of the same materials chosen at random. However, due to inconsistencies of a manufacturer's processes and the contractor's installation methods, materials of similar construction may contain various amounts of asbestos. Furthermore, some materials that were not originally specified to contain asbestos may in fact contain this mineral. For example, cementitious pipe insulation and plaster were frequently mixed with asbestos at the construction site for ease of application. Locating all asbestos materials can only be definitively achieved by conducting exploratory demolition and sampling every section of pipe insulation, fitting or valve covering, fireproofing, and other suspect ACM.

Bulk samples of suspect ACM are analyzed using polarized light microscopy (PLM) coupled with dispersion staining, as described in 40 CFR Part 763 and the National Emissions Standard for Hazardous Air Pollutants (NESHAPS). NESHAPS is the standard industry protocol for the determination of asbestos in building materials. A suspect material is immersed in a solution of known refractive index and subjected to illumination by polarized light. The color displays that

result are compared to a standardized atlas whereby the specific variety of asbestos is determined. It should also be recognized that PLM is primarily a qualitative identification method whereby asbestos percentage, if any, is estimated. While EPA, New York State, and New York City regulations governing ACM consider materials containing greater then 1-percent as asbestos, accurately quantifying asbestos content below 5-percent has been shown to be unreliable.

The New York State Department of Health has recently revised the PLM Stratified Point Counting Method. The March 25th, 2011 method, "Polarized Light Microscopy Methods for Identifying and Quantifying Asbestos in Bulk Samples" can be found as Item 198.1 in the Environmental Laboratory Approval program (ELAP) Certification manual. Whereas the procedure of analysis for bulk samples that fall into the category of "Non-friable Organically Bound" (NOB) can be found in the March 25th 2011 method “Polarized-Light Microscope Method for Identifying and Quantifying Asbestos in Non-Friable Organically Bound Bulk Samples”, Item 198.6 in the ELAP Certification Manual. This category includes any sample in a flexible to rigid asphalt or vinyl matrix (floor tiles, mastic, roofing shingles, roofing felt, etc.). These samples must be “ashed” in a muffle furnace at 480-degrees Celsius (to remove organic matrix), treated with acid (to remove any mineral carbonate), and filtered through a 0.4-micron polycarbonate filter before being analyzed by PLM. The sample must be weighted between each of these steps to track the percent loss of organic matrix.

ELAP has determined that analysis of NOB materials is not reliably performed by PLM. Therefore, if PLM analysis yields results of 1-percent asbestos or less, the result must be confirmed by TEM. For bulk samples that undergo TEM analysis, the March 25th, 2011 method “Transmission Electron Microscope Method for Identifying and Quantitating Asbestos in Non-Friable organically Bound Bulk Samples” must be used and can be found as Item 198.4 in the ELAP Certification Manual. ELAP certified laboratories must include the following statement with their PLM analysis results for each “negative” (1-percent or less asbestos) NOB sample: "Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Before this material can be considered or treated as non-ACM, confirmation must be made by quantitative transmission electron microscopy".

All samples are initially analyzed by Polarized Light Microscopy in accordance with Item 198.1 and 198.6 of the ELAP Certification Manual. Samples which yield a negative PLM result and which are classified as a "non-friable" material, are then re-analyzed utilizing TEM methodology in accordance with Item 198.4 of the ELAP Certification Manual. The laboratory performing both these analysis procedures Atlas Environmental Lab, Corp. located at 255 West 36th Street, New York, NY 10018. The laboratory has received accreditation from the following agencies:

- National Voluntary Laboratory Accreditation Program (Lab Code 500092-0)
- New York State Environmental Laboratory Approval Program (Lab No. 11999)
- American Industrial Hygiene Association Accredited Laboratory (Lab No. 208306)

B. LEAD-BASED PAINT

Painted surfaces within the space equivalents in the scope of work were identified and grouped together by component type, substrate and visible color. In similar fashion, the inspection continued in each space equivalent with the identification of unique combinations of component, substrate and visible color. A random representative area of each unique combination was sampled and tested. For each of these designated components, an area on the component was chosen which represents the paint on that building component. During the inspection, components that are accessible surfaces, friction surfaces, impact surfaces, or have deteriorated paint was identified.

The readings of paint surfaces were taken using Heuresis Pb200i and RMD LPA-1 XRF Lead Paint Spectrum Analyzers. The Heuresis and LPA-1 method of measurement is based on the spectrometric analysis of lead K-shell X-ray fluorescence within a controlled depth of interrogation. The Heuresis and LPA-1 Analyzers uses a Co-57 radioactive source and an advanced, solid-state, room temperature, radiation detector to generate and detect the x-ray fluorescence spectrum of a painted surface. The spectrum is then analyzed by a microprocessor to eliminate the effects of substrate and other factors such as scattering to allow an accurate determination of the amount of lead on a surface. The Heuresis and LPA-1 automatically analyzes spectrometric data in real time and differentiates the lead signal from the spectrum. The x-ray fluorescence properties are determined through calibration process and are used for automatic substrate correction and calculation of the lead content of a painted surface.

For quality control, the XRF instrument was calibrated using a U.S. Department of Commerce National Institute of Standards and Technology (NIST) Level III 1.0 mg/cm2 lead based paint film. For each calibration, three (3) XRF readings were taken on the paint film. The average of these three (3) readings was then subtracted from the known lead content in the paint film. The difference was compared with an Environmental Protection Agency (EPA)-approved tolerance range. Such calibration procedures were conducted at the start and at the end of the workday

C. POLYCHLORINATED BIPHENYLS (PCBs)

PCBs belong to a broad family of man-made organic chemicals known as chlorinated hydrocarbons. PCBs were domestically manufactured from 1929 until their manufacture was banned in 1979. They have a range of toxicity and vary in consistency from thin, light-colored liquids to yellow or black waxy solids. Due to their non-flammability, chemical stability, high boiling point, and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics, and rubber products; in pigments, dyes, and carbonless copy paper; and many other industrial applications.

Although no longer commercially produced in the United States, PCBs may be present in products and materials produced before the 1979 PCB ban. Products that may contain PCBs include: Transformers and capacitors, Oil used in motors and hydraulic systems, Fluorescent light ballasts, Adhesives and tapes, Caulking, Plastics, etc.

The PCBs used in these products were chemical mixtures made up of a variety of individual chlorinated biphenyl components, known as congeners. Most commercial PCB mixtures are known in the United States by their industrial trade names. The most common trade name is aroclor.

Polychlorinated biphenyls (PCBs) are regulated pursuant to the United States Environmental Protection Agency Code of Federal Regulations (40 CFR Part 761) and the Toxic Substances Control Act (TSCA – 15 U.S.C. 2605). These regulations require certain testing and reporting requirements to determine management, recycling and disposal options for PCBs.

3.0 INSPECTION SCOPE AND MATERIAL ASSESSMENT

The areas inspected for ACM materials that may be impacted by the proposed SED Survey project at the Bedford Village Elementary School. Locations surveyed include:

- Throughout Building

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 08/30/2022 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **None**

The following materials **Contain Asbestos as per AHERA Report:**

- **Floor Tiles and Mastic - Not Affected by Current SOW**

Analytical results of the bulk samples collected on 08/30/2022 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Wall Plaster (White) - (Interior)
- Wall Plaster (Brown) - (Interior)
- Cinderblock Wall Mortar (Gray) - (Interior)
- Brown Glazed Block Mortar (Gray) - (Interior)
- Tan Glazed Block Mortar (Gray) - (Interior)
- Interior Brick Mortar (Gray) - (Interior)
- Gypsum Board (Gray) - (Interior)
- Joint Compound (White) - (Interior)
- Wall Paper (White) - (Interior)
- Laminated Flooring Glue/Leveling Compound (Gray) - (Interior)
- Mastic Associated with Brown Cove Base Molding (Tan) - (Interior)
- Cove Base Molding (Brown) - (Interior)
- 2’x2’ Fissured Ceiling Tile (White) - (Interior)
- 2’x2’ Pinhole Ceiling Tile (White) - (Interior)

- 2'x4' Fissured Ceiling Tile (White) - (Interior)
- 1'x1' Fissured Glue on Ceiling Tile (White) - (Interior)
- Glue Associated with 1'x1' Ceiling Tile (Tan) - (Interior)
- Exterior Brick Mortar (Red) - (Exterior)
- Exterior Textured Paint on Wood (White) - (Exterior)
- Exterior Floor Expansion Joint Insulation (Black) - (Exterior)
- Exterior Floor Expansion Joint Caulking (Gray) - (Exterior)

D. LEAD-BASED PAINT

Based upon XRF readings, lead has been confirmed to exist in the following tested combinations:

- **Brown Paint on Glazed Block Wall (Corridor 62)**
- **Blue Paint on Concrete Wall Strip (Corridor 14)**
- **Brown Paint on Glazed Block Wall (Corridor 14)**
- **Light Blue Paint on Compressed Board Wall Board (Room 78)**
- **White Paint on Wood Door Frame (Corridor 62)**
- **White Paint on Wood Ext. Door Frame (Corridor 62)**
- **White Paint on Wood Exterior Wall (Corridor 62)**
- **White Paint on Brick Exterior Wall (Corridor 62)**
- **Black Paint on Metal Exterior Column (Corridor 62)**

Lead was **not detected** in the following tested combinations via XRF readings:

- White Paint on Plaster Wall (Room 64)
- Brown Paint on Gypsum Wall (Room 64)
- White Paint on Cinderblock Wall (Corridor 62)
- White Paint on Wood Wall Trim (Corridor 62)
- White Paint on Gypsum Wall (Corridor 62)
- Light Blue Paint on Cinderblock Wall (Corridor 14)
- White Paint on Gypsum Wall (Art Room 17)
- Light Green Paint on Gypsum Wall (Room 15)
- Light Blue Paint on Plaster Wall (Room 78)
- Light Blue Paint on Brick Wall (Corridor 14B)
- Light Blue Paint on Gypsum Wall (Corridor 14B)
- Tan Paint on Gypsum Wall (Classroom 01)
- Light Blue Paint on Wall Paper Wall (Room 21)
- Beige Paint on Gypsum Wall (Room 23)
- Beige Paint on Cinderblock Wall (Room 28)
- Light Blue Paint on Gypsum Wall (Room 24)
- Tan Paint on Gypsum Wall (Room 24)
- Blue Paint on Gypsum Wall (Dining Room 54)
- Light Blue Paint on Brick Wall (Corridor 149)

- Light Blue Paint on Plaster Wall (Main Office)
- Beige Paint on Plaster Wall (Corridor 62)
- Green Paint on Wood Door (Corridor 62)
- Back Paint on Metal Exterior Handrail (Corridor 62)
- White Paint on Wood Interior Window Wall Frame (Corridor 62)
- White Paint on Wood Radiator Cover (Corridor 62)
- Off White Paint on Plaster Wall (Conf. 63)

E. PCB-CONTAINING MATERIAL

Analytical results of the bulk samples collected indicate that the following materials **contain PCB** (greater than 50 PPM):

- **None**

Analytical results of the bulk samples collected indicate that the following materials **did not contain PCB** (less than 50 PPM):

- Exterior Floor Expansion Joint Caulking (Gray) – First floor Main Entrance

4.0 INSPECTION RESULTS

A. ASBESTOS-CONTAINING MATERIAL

The asbestos inspection involved a thorough visual examination of all areas that may be impacted by the proposed SED Survey project at the Bedford Village Elementary School. The following suspect materials were sampled and analyzed for asbestos content by WSP:

4.1 Table 4.1 – Suspect Materials Inspected

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
WSP Sampled on 08/30/22			
01	Interior	Wall Plaster (White)	NAD
02	Interior	Wall Plaster (Brown)	NAD
03	Interior	Cinderblock Wall Mortar (Gray)	NAD
04	Interior	Brown Glazed Block Mortar (Gray)	NAD
05	Interior	Tan Glazed Block Mortar (Gray)	NAD
06	Interior	Interior Brick Mortar (Gray)	NAD
07	Interior	Gypsum Board (Gray)	NAD
08	Interior	Joint Compound (White)	NAD
09	Interior	Wall Paper (White)	NAD

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
10	Interior	Laminated Flooring Glue/Leveling Compound (Gray)	NAD
11	Interior	Mastic Associated with Brown Cove Base Molding (Tan)	NAD
12	Interior	Cove Base Molding (Brown)	NAD
13	Interior	2'x2' Fissured Ceiling Tile (White)	NAD
14	Interior	2'x2' Pinhole Ceiling Tile (White)	NAD
15	Interior	2'x4' Fissured Ceiling Tile (White)	NAD
16	Interior	1'x1' Fissured Glue on Ceiling Tile (White)	NAD
17	Interior	Glue Associated with 1'x1' Ceiling Tile (Tan)	NAD
18	Exterior	Exterior Brick Mortar (Red)	NAD
19	Exterior	Exterior Textured Paint on Wood (White)	NAD
20	Exterior	Exterior Floor Expansion Joint Insulation (Black)	NAD
21	Exterior	Exterior Floor Expansion Joint Caulking (Gray)	NAD
AHERA Report			
-	**Throughout**	**Floor Tiles and Mastic - Not Affected by Current SOW**	**ACM**

Bold = Positive for ACM NAD = No Asbestos Detected NA/PS = Not analyzed/ positive sample

4.2 CONDITION AND FRIABLITY ASSESSMENT TABLE

For each inspection conducted, the inspector classifies ACM or Assumed ACM materials by friability and condition. This helps to determine the extent of damage in certain areas as well as the potential for further damage and Asbestos release due to disturbance of the material.

Table 4.2 – Condition and Friability Assessment

Location	Material	Quantity	Friability	Condition
None				

Condition Definitions:
Good: None/Minimal apparent damage to ACM
Fair: Up to 10% localized damage or up to 25% of the entire ACM is damaged
Poor: Over 10% localized damage or over 25% of the entire ACM is damaged

4.3 SAMPLE ANALYSIS TABLE

Laboratory analysis results, in tabular form, are included in Appendix A.

B. LEAD-BASED PAINT

The lead Inspection involved a thorough visual examination of all accessible areas impacted by the proposed SED Survey project at the Bedford Village Elementary School. The following suspect surfaces were tested for lead content:

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
Previous WSP Report dated 08/30/22						
1	Calibration Check @ 1.0	---	---	---	---	1.1
2	Calibration Check @ 1.0	---	---	---	---	1.0
3	Calibration Check @ 1.0	---	---	---	---	1.1
4	Calibration Check @ 0.0	---	---	---	---	0.3
5	Calibration Check @ 0.0	---	---	---	---	0.2
6	Calibration Check @ 0.0	---	---	---	---	0.1
7	Room 64	Wall	White	Plaster	Intact	0.2
8	Room 64	Wall	Brown	Gypsum	Intact	0.6
9	Corridor 62	Wall	White	Cinderblock	Intact	0.5
10	Corridor 62	Wall Trim	White	Wood	Intact	0.1
11	**Corridor 62**	**Wall**	**Brown**	**Glazed Block**	**Intact**	**10.5**
12	Corridor 62	Wall	White	Gypsum	Intact	0.2
13	Corridor 14	Wall	Light Blue	Cinderblock	Intact	0.4
14	**Corridor 14**	**Wall Strip**	**Blue**	**Concrete**	**Intact**	**1.5**
15	**Corridor 14**	**Wall**	**Brown**	**Glazed Block**	**Intact**	**1.2**
16	Art Room 17	Wall	White	Gypsum	Intact	0.1
17	Room 15	Wall	Light Green	Gypsum	Intact	0.2
18	**Room 78**	**Wall Board**	**Light Blue**	**Compressed Board**	**Intact**	**1.7**
19	Room 78	Wall	Light Blue	Plaster	Intact	0.2
20	Corridor 14B	Wall	Light Blue	Brick	Intact	0.1
21	Corridor 14B	Wall	Light Blue	Gypsum	Intact	0.1
22	Classroom 01	Wall	Tan	Gypsum	Intact	0.1
23	Room 21	Wall	Light Blue	Wall Paper	Intact	0.3
24	Room 23	Wall	Beige	Gypsum	Intact	0.0
25	Room 28	Wall	Beige	Cinderblock	Intact	0.5

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
26	Room 24	Wall	Light Blue	Gypsum	Intact	0.1
27	Room 24	Wall	Tan	Gypsum	Intact	0.0
28	Dining Room 54	Wall	Blue	Gypsum	Intact	0.4
29	Corridor 149	Wall	Light Blue	Brick	Intact	-0.1
30	Main Office	Wall	Light Blue	Plaster	Intact	0.1
31	Corridor 62	Wall	Beige	Plaster	Intact	0.2
32	Corridor 62	Door	Green	Wood	Intact	0.2
33	**Corridor 62**	**Door Frame**	**White**	**Wood**	**Intact**	**1.6**
34	**Corridor 62**	**Ext. Door Frame**	**White**	**Wood**	**Intact**	**15.6**
35	**Corridor 62**	**Exterior Wall**	**White**	**Wood**	**Intact**	**19.6**
36	**Corridor 62**	**Exterior Wall**	**White**	**Brick**	Intact	**1.1**
37	**Corridor 62**	**Exterior Column**	**Black**	**Metal**	Intact	**22.4**
38	Corridor 62	Exterior Handrail	Back	Metal	Intact	0.1
39	Corridor 62	Interior Window Wall Frame	White	Wood	Intact	0.2
40	Corridor 62	Radiator Cover	White	Wood	Intact	0.3
41	Conf. 63	Wall	Off White	Plaster	Intact	
42	Calibration Check @ 1.0	---	---	---	---	1.0
43	Calibration Check @ 1.0	---	---	---	---	1.0
44	Calibration Check @ 1.0	---	---	---	---	1.0
45	Calibration Check @ 0.0	---	---	---	---	0.2
46	Calibration Check @ 0.0	---	---	---	---	0.2
47	Calibration Check @ 0.0	---	---	---	---	0.3

C. PCB-CONTAINING MATERIAL

The PCB Inspection involved a thorough visual examination of all areas that may be impacted by the proposed SED Survey project at the Bedford Village Elementary School. The following suspect materials were tested for PCB content:

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	PCB CONTENT (PPM)
01	First Floor Main Entrance	Exterior Floor Expansion Joint Caulking (Gray)	ND

5.0 AREAS NOT ACCESSIBLE

During the inspection the following areas were not accessible:

Spaces within Walls/Floors/Ceilings: No destructive sampling was performed on concealed spaces in walls to access plenum, chases etc. It should be assumed that asbestos containing materials may exist in these spaces. Any suspect materials encountered during work should be sampled for analysis before work continues.

Building Envelope: No destructive sampling was performed on the building envelope. It should be assumed that asbestos, lead and PCB containing materials may exist in these spaces. Any suspect materials encountered during work should be sampled for analysis before work continues.

6.0 CONCLUSIONS AND RECOMMENDATIONS

LBP was identified in this inspection that may be impacted as part of the proposed SED Survey project at the Bedford Village Elementary School.

No ACM or PCB have been identified in this inspection that may be impacted as part of the proposed SED Survey project at the Bedford Village Elementary School.

The ACM, LBP & PCB inspection was conducted at the request of Bedford Centra School District for the proposed SED Survey project at the Bedford Village Elementary School. Any change in the scope of work will require further investigation to accurately classify any additional ACM, LBP or PCBs resulting from the modified or updated scope of work.

7.0 REPORT CERTIFICATIONS

This report, and the supporting data, findings, conclusions, opinions, and recommendations it contains represent the result of WSP's efforts for the environmental inspection work for the Bedford Village Elementary School, SED Survey project.

Opinions and recommendations presented in this report apply to site conditions and features as they existed at the time of WSP's site visits, and those reasonably foreseeable. They cannot necessarily apply to conditions and features of which WSP is unaware and has not had the opportunity to evaluate.

The conclusions presented in this report are professional opinions solely upon WSP's visual observations of accessible areas, laboratory test data, and current regulatory requirements. These conclusions are intended exclusively for the purpose stated herein and the site indicated for the project indicated.

Prepared by:

Josue Garcia
NYS DOL Inspector

Reviewed by:

Steven Eget, PE
Vice President

APPENDIX A:
ASBESTOS SAMPLE ANALYSIS RESULTS IN TABULAR FORM

APPENDIX A
SAMPLE ANALYSIS RESULTS IN TABULAR FORM
BEDFORD VILLAGE ELEMENTARY SCHOOL
SED SURVEY PROJECT
45 COURT ROAD
BEDFORD, NY 10506

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
WSP Sampled on 08/30/2022					
01	01	First Floor, Corridor 62	Wall Plaster (White)	NAD	N/A
	02	First Floor, Room 66A		NAD	N/A
	03	First Floor, Room 68		NAD	N/A
02	04	First Floor, Corridor 62	Wall Plaster (Brown)	NAD	N/A
	05	First Floor, Room 66A		NAD	N/A
	06	First Floor, Room 68		NAD	N/A
03	07	First Floor, Corridor 62	Cinderblock Wall Mortar (Gray)	NAD	N/A
	08	First Floor, Corridor 14		NAD	N/A
	09	First Floor, Corridor by Room 26		NAD	N/A
04	10	First Floor, Corridor 62	Brown Glazed Block Mortar (Gray)	NAD	N/A
	11	First Floor, Corridor 49C		NAD	N/A
05	12	First Floor, Corridor 14	Tan Glazed Block Mortar (Gray)	NAD	N/A
	13	First Floor, Corridor 14		NAD	N/A
06	14	First Floor, Corridor 14B	Interior Brick Mortar (Gray)	NAD	N/A
	15	First Floor, Corridor 14B		NAD	N/A
07	16	First Floor, Room 15	Gypsum Board (Gray)	NAD	N/A
	17	First Floor, Room 02		NAD	N/A
08	18	First Floor, Room 15	Joint Compound (White)	NAD	N/A
	19	First Floor, Room 02		NAD	N/A
09	20	First Floor, Room 25	Wall Paper (White)	NAD	NAD
	21	First Floor, Room 26		NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
10	22	First Floor, Corridor 62	Laminated Flooring Glue/Leveling Compound (Gray)	NAD	NAD
	23	First Floor, Conf. 63		NAD	NAD
11	24	First Floor, Corridor 62	Mastic Associated with Brown Cove Base Molding (Tan)	NAD	NAD
	25	First Floor, Corridor 62		NAD	NAD
12	26	First Floor, Corridor 62	Cove Base Molding (Brown)	NAD	NAD
	27	First Floor, Corridor 62		NAD	NAD
13	28	First Floor, Corridor 49C	2'x2' Fissured Ceiling Tile (White)	NAD	NAD
	29	First Floor, Corridor 14		NAD	NAD
14	30	First Floor, Corridor 16	2'x2' Pinhole Ceiling Tile (White)	NAD	NAD
	31	First Floor, Corridor 08		NAD	NAD
15	32	First Floor, Room 68	2'x4' Fissured Ceiling Tile (White)	NAD	NAD
	33	First Floor, Room 66A		NAD	NAD
16	34	First Floor, Room 06	1'x1' Fissured Glue on Ceiling Tile (White)	NAD	NAD
	35	First Floor, Room 02		NAD	NAD
17	36	First Floor, Room 06	Glue Associated with 1'x1' Ceiling Tile (Tan)	NAD	NAD
	37	First Floor, Room 02		NAD	NAD
18	38	First Floor, Main Entrance	Exterior Brick Mortar (Red)	NAD	N/A
	39	First Floor, Main Entrance		NAD	N/A
19	40	First Floor, Main Entrance	Exterior Textured Paint on Wood (White)	NAD	NAD
	41	First Floor, Main Entrance		NAD	NAD
20	42	First Floor, Main Entrance	Exterior Floor Expansion Joint Insulation (Black)	NAD	NAD
	43	First Floor, Main Entrance		NAD	NAD
21	44	First Floor, Main Entrance	Exterior Floor Expansion Joint Caulking (Gray)	NAD	NAD
	45	First Floor, Main Entrance		NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

APPENDIX B:
ASBESTOS BULK SAMPLE FIELD DATA SHEETS WITH CHAIN OF CUSODY & LABORATORY RESULTS

Atlas Environmental Lab, Corp.
255 West 36th Street, Suite# 1503
New York, NY 10018
Phone:(212) 563-0400 Fax:(212) 563-0401
www.atlasenvironmentallab.com

Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford Central School District / 31405320.010
Project Address: Bedford Village E. S.
Collected By: Client
Work Area: First Floor & Exterior Main Entrance

AEL ID# BK0922007
Date Received: 9/1/2022
PLM Date Analyzed: 9/2/2022
TEM Date Analyzed: 9/3/2022
Report Date: 9/4/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
01-01	BK0922007-1	First Floor Corridor 62 - Wall Plaster, White Coat	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
01-02	BK0922007-2	First Floor Room 66A - Wall Plaster, White Coat	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
01-03	BK0922007-3	First Floor Room 68 - Wall Plaster, White Coat	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
02-04	BK0922007-4	First Floor Corridor 62 - Wall Plaster, Brown Coat	Brown, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
02-05	BK0922007-5	First Floor Room 66A - Wall Plaster, Brown Coat	Brown, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
02-06	BK0922007-6	First Floor Room 68 - Wall Plaster, Brown Coat	Brown, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
03-07	BK0922007-7	First Floor Corridor 62 - Cinderblock Wall Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
03-08	BK0922007-8	First Floor Corridor 14 - Cinderblock Wall Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
03-09	BK0922007-9	First Floor Corridor by Room 26 - Cinderblock Wall Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		
04-10	BK0922007-10	First Floor Corridor 62 - Brown Glazed Block Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD		X		

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Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford Central School District / 31405320.010
Project Address: Bedford Village E. S.
Collected By: Client
Work Area: First Floor & Exterior Main Entrance

AEL ID# BK0922007
Date Received: 9/1/2022
PLM Date Analyzed: 9/2/2022
TEM Date Analyzed: 9/3/2022
Report Date: 9/4/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
04-11	BK0922007-11	First Floor Corridor 49C - Brown Glazed Block Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
05-12	BK0922007-12	First Floor Corridor 14 - Tan Glazed Block Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
05-13	BK0922007-13	First Floor Corridor 14 - Tan Glazed Block Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
06-14	BK0922007-14	First Floor Corridor 14B - Interior Brick Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
06-15	BK0922007-15	First Floor Corridor 14B - Interior Brick Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
07-16	BK0922007-16	First Floor Room 15 - Gypsum Board, White	White, Homogeneous, Friable	Not Applicable			5%CELL	95%	**NAD**		**X**		
07-17	BK0922007-17	First Floor Room 02 - Gypsum Board, White	White, Homogeneous, Friable	Not Applicable			5%CELL	95%	**NAD**		**X**		
08-18	BK0922007-18	First Floor Room 15 - Joint Compound, White	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
08-19	BK0922007-19	First Floor Room 02 - Joint Compound, White	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
09-20	BK0922007-20	First Floor Room 25 - Wall Paper, White	White, Homogeneous, Non-Fibrous	13.1	23.4	63.5	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**

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Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford Central School District / 31405320.010
Project Address: Bedford Village E. S.
Collected By: Client
Work Area: First Floor & Exterior Main Entrance

AEL ID# BK0922007
Date Received: 9/1/2022
PLM Date Analyzed: 9/2/2022
TEM Date Analyzed: 9/3/2022
Report Date: 9/4/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
09-21	BK0922007-21	First Floor Room 26 - Wall Paper, White	White, Homogeneous, Non-Fibrous	4.6	15.7	79.6	0%	100%	**NAD** Inconclusive	**NAD**		X	X
10-22	BK0922007-22	First Floor Corridor 62 - Laminated Flooring, Glue/Leveling Compound, Gray	Grey, Homogeneous, Non-Fibrous	4.7	29.3	66.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
10-23	BK0922007-23	First Floor Conf. 63 - Laminated Flooring, Glue/Leveling Compound, Gray	Grey, Homogeneous, Non-Fibrous	10.6	24.2	65.2	0%	100%	**NAD** Inconclusive	**NAD**		X	X
11-24	BK0922007-24	First Floor Corridor 62 - Mastic Associated With Brown	Brown/Tan, Homogeneous, Non-Fibrous	14.1	15.4	70.6	0%	100%	**NAD** Inconclusive	**NAD**		X	X
11-25	BK0922007-25	First Floor Conf. 63 - Cove Base Molding, Tan	Brown/Tan, Homogeneous, Non-Fibrous	15.9	11.8	72.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X
12-26	BK0922007-26	First Floor Corridor 62 - Cove Base Molding, Brown	Brown, Homogeneous, Non-Fibrous	15.5	6.2	78.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X
12-27	BK0922007-27	First Floor Corridor 62 - Cove Base Molding, Brown	Brown, Homogeneous, Non-Fibrous	6.4	5.2	88.4	0%	100%	**NAD** Inconclusive	**NAD**		X	X
13-28	BK0922007-28	First Floor Corridor 49C - 2'x2' Fissured Ceiling Tile, White	White, Homogeneous, Non-Fibrous	13.2	29.8	57.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
13-29	BK0922007-29	First Floor Corridor 14 - 2'x2' Fissured Ceiling Tile, White	White, Homogeneous, Non-Fibrous	4.8	82.1	13.0	0%	100%	**NAD** Inconclusive	**NAD**		X	X
14-30	BK0922007-30	First Floor Corridor 16 - 2'x2' Pinhole Ceiling Tile, White	White, Homogeneous, Non-Fibrous	9.5	83.3	7.3	0%	100%	**NAD** Inconclusive	**NAD**		X	X

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Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford Central School District / 31405320.010
Project Address: Bedford Village E. S.
Collected By: Client
Work Area: First Floor & Exterior Main Entrance

AEL ID# BK0922007
Date Received: 9/1/2022
PLM Date Analyzed: 9/2/2022
TEM Date Analyzed: 9/3/2022
Report Date: 9/4/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
14-31	BK0922007-31	First Floor Corridor 08 - 2'x2' Pinhole Ceiling Tile, White	White, Homogeneous, Non-Fibrous	26.1	45.9	28.0	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
15-32	BK0922007-32	First Floor Room 68 - 2'x4' Fissured Ceiling Tile, White	White, Homogeneous, Non-Fibrous	7.0	70.3	22.8	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
15-33	BK0922007-33	First Floor Room 66A - 2'x4' Fissured Ceiling Tile, White	White, Homogeneous, Non-Fibrous	20.5	68.0	11.4	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
16-34	BK0922007-34	First Floor Room 06 - 1'x1' Fissured Glue on Ceiling Tile, White	Tan, Homogeneous, Non-Fibrous	6.3	68.2	25.5	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
16-35	BK0922007-35	First Floor Room 02 - 1'x1' Fissured Glue on Ceiling Tile, White	Tan, Homogeneous, Non-Fibrous	62.8	6.9	30.3	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
17-36	BK0922007-36	First Floor Main Entrance - Exterior Brick Mortar, Gray	Tan, Homogeneous, Non-Fibrous	4.4	93.8	1.8	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
17-37	BK0922007-37	First Floor Room 06 - Glue Associated with 1'x1' Ceiling Tile, Tan	Tan, Homogeneous, Non-Fibrous	23.4	29.8	46.8	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
18-38	BK0922007-38	First Floor Main Entrance - Exterior Brick Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
18-39	BK0922007-39	First Floor Main Entrance - Exterior Brick Mortar, Gray	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
19-40	BK0922007-40	First Floor Main Entrance - Exterior Textured Paint on Wood, White	White, Homogeneous, Non-Fibrous	4.6	40.0	55.4	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**

Atlas Environmental Lab, Corp.
255 West 36th Street, Suite# 1503
New York, NY 10018
Phone:(212) 563-0400 Fax:(212) 563-0401
www.atlasenvironmentallab.com

Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford Central School District / 31405320.010
Project Address: Bedford Village E. S.
Collected By: Client
Work Area: First Floor & Exterior Main Entrance

AEL ID# BK0922007
Date Received: 9/1/2022
PLM Date Analyzed: 9/2/2022
TEM Date Analyzed: 9/3/2022
Report Date: 9/4/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	AII %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
19-41	BK0922007-41	First Floor Main Entrance - Exterior Textured Paint on Wood, White	White, Homogeneous, Non-Fibrous	23.4	49.8	26.8	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
20-42	BK0922007-42	First Floor Main Entrance - Exterior Floor Expansion Joint Insulation, Black	Black, Homogeneous, Non-Fibrous	21.2	5.4	73.4	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
20-43	BK0922007-43	First Floor Main Entrance - Exterior Floor Expansion Joint Insulation, Black	Black, Homogeneous, Non-Fibrous	13.1	5.8	81.0	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
21-44	BK0922007-44	First Floor Main Entrance - Exterior Floor Expansion Joint Caulking, Gray	Grey, Homogeneous, Non-Fibrous	3.8	7.7	88.5	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
21-45	BK0922007-45	First Floor Main Entrance - Exterior Floor Expansion Joint Caulking, Gray	Grey, Homogeneous, Non-Fibrous	4.5	20.3	75.1	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**

MA

Quantitative Analysis (Semi/Full):Bulk Asbestos Analysis-PLM by EPA 600/M4-82-020 per 40 CFR or ELAP198.1 (friable) and 198.6 (NOB) samples for New York.

NAD=no asbestos detected, NA/PS=Not Analyzed/Positive Stop, Trace=<1%,FBGL=Fiberglass, CELL=Cellulose,CHRY=Chrysotile,Amo=Amosite,CRO=Crocidolite,ANTH=Anthophylite, TRE=Tremolite, ACT=Actinolite, NA=not applicable.

PLM is not consistently reliable in detecting Asbestos in floor coverings and similar non friable organically bound materials. NAD or Trace results by PLM are inconclusive.

TEM is currently the only method that can be used to determine if this material can be considered or treated as non asbestos containing in NY State.

All samples were prepared and analyzed in accordance with the EPA "TEM Method for Identifying and Quantifying Asbestos in Non-Fibrous Organically Bound Bulk Samples" ELAP 198.4".

ORG%=Ashed Organic%, AII= Acid Insoluble Inorganic%, ASI= Acid Soluble Inorganic%

NYS-ELAP#11999, NVLAP Lab Code: 500092-0, NJ ID: NY034 "ELCP on NJ won't apply to TEM", CT ID:PH-0154

PLM Analyst: HE TEM Analyst: FC Approved by:

BK0922007

1171

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.010

CLIENT: Bedford Central School District

PROJECT SITE: Bedford Village E.S.

Project Manager: Alex Smolyar

WSP
TELEPHONE NO. : (212) 612-7900
ADDRESS: One Penn Plaza, 4th Floor, New York, NY 10119

LOCATION(S) SURVEYED : First Floor & Exterior Main Entrance

PROPOSED PROJECT : SED Survey

DATE(S) OF INSPECTION: 08/30/2022

Inspector(s): Josue Garcia & S. Wong

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐12 HR. ☐24 HR. ☐48 HR. X 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
01	01	First Floor Corridor 62	Wall Plaster, white coat		
	02	↓ Room 66A	↓		
	03	↓ Room 68	↓		
02	04	First Floor Corridor 62	Wall Plaster, Brown coat		
	05	↓ Room 66A	↓		
	06	↓ Room 68	↓		
03	07	First Floor Corridor 62	Cinderblock wall Mortar, Gray		
	08	↓ Corridor 14	↓		
	09	↓ Corridor by Room 26	↓		
04	10	First Floor Corridor 62	Brown Glazed Block Mortar, Gray		
	11	↓ Corridor 49C	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)	/ /	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM
J. Garcia+											
Received by: (print) Monique Allen	(Sign)	9/1/22	12:55 AM/PM	Received by: (print)	(Sign)	/ /	AM/PM	Received by: (print)	(Sign)	/ /	AM/PM

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

BK0922007

1151

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.010

CLIENT: Bedford Central School District

PROJECT SITE: Bedford Village E.S.

Project Manager: Alex Smolyar

LOCATION(S) SURVEYED: First Floor & Exterior Main Entrance

PROPOSED PROJECT: SED Survey

DATE(S) OF INSPECTION: 08/30/2022

Inspector(s): Josue Garcia & S. Wong

WSP
TELEPHONE NO.: (212) 612-7900
ADDRESS: One Penn Plaza, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐12 HR. ☐24 HR. ☐48 HR. X 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
05	12	First Floor Corridor 14	Tan Glazed Block Mortar, Gray		
	13	↓ ↓	↓		
06	14	First Floor Corridor 14B	Interior Brick Mortar, Gray		
	15	↓ ↓	↓		
07	16	First Floor Room 15	Gypsum Board, White		
	17	↓ Room 02	↓		
08	18	First Floor Room 15	Joint Compound, White		
	19	↓ Room 02	↓		
09	20	First Floor Room 25	Wall Paper, White		
	21	↓ Room 26	↓		
10	22	First Floor Corridor 62	Laminated Flooring, Glue/Leveling Compound, Gray		
	23	↓ Conf. to 63	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)	/ /	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM
J. Garcia+											
Received by: (print) Monique A.	(Sign)	9/1/22	12:55 AM/PM	Received by: (print)	(Sign)	/ /	AM/PM	Received by: (print)	(Sign)	/ /	AM/PM

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

BK0922C07

1151

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.010

CLIENT: Bedford Central School District

PROJECT SITE: Bedford Village E.S.

Project Manager: Alex Smolyar

LOCATION(S) SURVEYED: First Floor & Exterior Main Entrance.

PROPOSED PROJECT: SED Survey

DATE(S) OF INSPECTION: 08/30/2022

Inspector(s): Josue Garcia & J. Kwong

WSP
TELEPHONE NO.: (212) 612-7900
ADDRESS: One Penn Plaza, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. X 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
11	24	First Floor Corridor 62	Mastic Associated with Brown		
	25	↓ Conf. & 63	Cove Base Molding, Tan		
12	26	First Floor Corridor 62	Cove Base Molding, Brown		
	27	↓ ↓	↓		
13	28	First Floor Corridor 49C	2'X2' Fissured Ceiling Tile, White		
	29	↓ ↓ 14	↓		
14	30	First Floor Corridor 16	2'x2' Pinhole Ceiling Tile, White		
	31	↓ ↓ 08	↓		
15	32	First Floor Room 68	2'x4' Fissured Ceiling Tile, White		
	33	↓ ↓ 66A	↓		
16	34	First Floor Room 06	1'x1' Fissured Glue on Ceiling		
	35	↓ ↓ 02	Tile, White		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)	/ /	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM
J. Garcia+											
Received by: (print)	(Sign)			Received by: (print)	(Sign)			Received by: (print)	(Sign)		
Monique A		9/1/22	12:55 AM/PM								

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

BK0922C07

1157

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.010

CLIENT: Bedford Central School District

PROJECT SITE: Bedford Village E.S.

Project Manager: Alex Smolyar

LOCATION(S) SURVEYED: First Floor & Exterior Main Entrance

PROPOSED PROJECT: SED Survey

DATE(S) OF INSPECTION: 08/30/2022

Inspector(s): Josue Garcia & S. Wong

WSP
TELEPHONE NO.: (212) 612-7900
ADDRESS: One Penn Plaza, 4th Floor, New York, NY 10119

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. X 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
17	36	First Floor Room 06	Glue Associated with 1'x1'		
	37	↓ ↓	Ceiling Tile, Tan		
18	38	First Floor Main Entrance	Exterior Brick Mortar, Gray		
	39	↓ ↓	↓		
19	40	First Floor Main Entrance	Exterior Textured Paint on Wood, White		
	41	↓ ↓	↓		
20	42	First Floor Main Entrance	Exterios Floor Expansion Joint		
	43	↓ ↓	Insulation, Black		
21	44	First Floor Main Entrance	Exterior floor Expansion Joint		
	45	↓ ↓	Caulking, Gray		

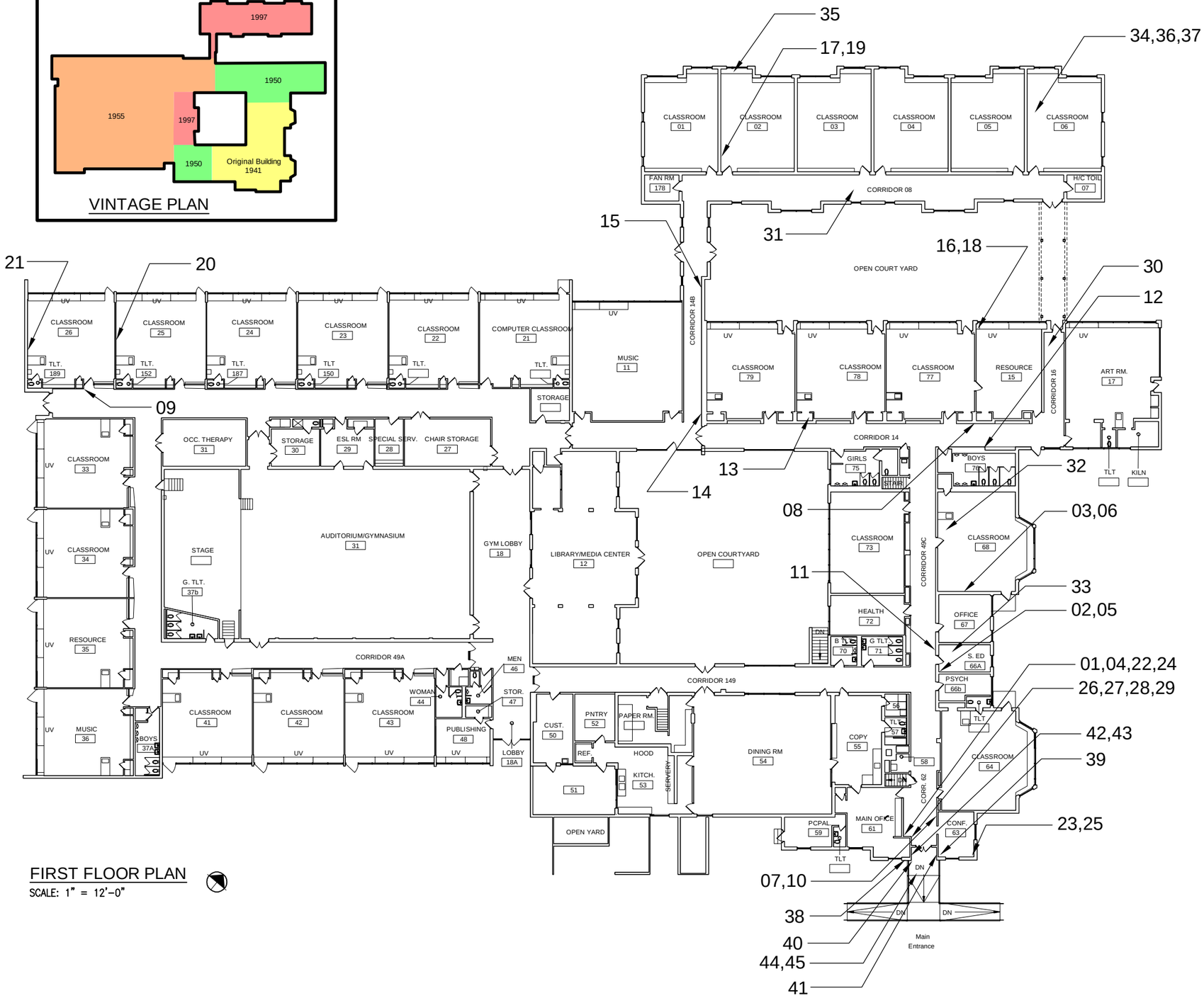
CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)	/ /	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM
J. Garcia+											
Received by: (print)	(Sign)			Received by: (print)	(Sign)			Received by: (print)	(Sign)		
Monique A		9/1/22	12:55 AM/PM								

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

APPENDIX C:
ASBESTOS BULK SAMPLE LOCATION DRAWINGS

VINTAGE PLAN



FIRST FLOOR PLAN

SCALE: 1" = 12'-0"

BEDFORD CENTRAL SCHOOL DISTRICT

Every Single Student, Every Single Day

BEDFORD CENTRAL SCHOOL DISTRICT

632 SOUTH BEDFORD ROAD
BEDFORD, NY 10506

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL: 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

BEDFORD VILLAGE
ELEMENTARY SCHOOL
SED SURVEY PROJECT
45 COURT ROAD
BEDFORD, NY 10506

DRAWING TITLE

BULK SAMPLE LOCATIONS
FIRST FLOOR PLAN

DRAWN BY: J.PEREZ	SCALE: AS SHOWN
INSP./INV: J. GARCIA	DATE: 09/27/2022
CERTIFICATE NO. 03-04292	DRAWING NUMBER:
CHECKED BY: A.SMOLYAR	BSL001
	DRAWING NUMBER: 1 OF 1

CONSULTANTS PROJECT 31405320.010

APPENDIX D:
ASBESTOS CONTAINING MATERIALS LOCATION DRAWINGS
[NOT APPLICABLE]

APPENDIX E:
LEAD XRF SHOT RESULTS

XRF LEAD-BASED PAINT TESTING DATA SHEET/CHAIN OF CUSTODY

PROJECT NO.: 31405320.010
CLIENT: Bedford CSD
INSPECTOR(S): S. Garcia & S. Wong
PROJ. MANAGER: P. Smolar

PROJECT NAME: Bedford Village ES
PROJECT LOCATION:
INSPECTION DATE: 08/30/2022

SPACE CHARACTERISTICS:
FLOOR #: _____ ROOM #: _____ ROOM NAME: _____

NOTES:

SAMPLE #	SUBSTRATE	COMPONENT DISCRIPTION: COLOR	CONDITION [I / F / P]	COMPONENT	WALL/SIDE DESIGN.	SIDE [L/C/R]	HEIGHT [L/M/U]	COMPONENT REPLICANT	QUANTITY (IF POSITIVE) [SF]	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	XRF READING [mg/cm²]
27	M PL (S) C CB PG CR B W V CT G FG OTHER:	Tan		Wall	A (B) C D RM CTR FL CL		RM		24			0.0
28	M PL (S) C CB PG CR B W V CT G FG OTHER:	Blue		Wall	A B C D RM CTR FL CL		Dining RM		5	4		0.4
29	M PL S C CB PG CR (B) W V CT G FG OTHER:	Light Blue		Wall	A B C D RM CTR FL CL		Corridor		14	9		0.1
30	M (PL) S C CB PG CR B W V CT G FG OTHER:	Blue		Wall	A B C D RM CTR FL CL		Main Office					0.1
31	M (PL) S C CB PG CR B W V CT G FG OTHER:	Beige		Wall	A (B) C D RM CTR FL CL		Corridor	6	2			0.2
32	M PL S C CB PG CR B (W) V CT G FG OTHER:	Green		Door	(A) B C D RM CTR FL CL							0.2
33	M PL S C CB PG CR B (W) V CT G FG OTHER:	White		DF	(A) B C D RM CTR FL CL							1.6
34	M PL S C CB PG CR B (W) V CT G FG OTHER:	"		Ext DF	A B C D RM CTR FL CL							15%
35	M PL S C CB PG CR B (W) V CT G FG OTHER:	"		Ext Wall	A B C D RM CTR FL CL							19.6
36	(M) PL S C CB PG CR B W V CT G FG OTHER:	"		Ext Wall	A B C D RM CTR FL CL							1.1
37	(M) PL S C CB PG CR B W V CT G FG OTHER:	Black		Ext. Column	A B C D RM CTR FL CL							22.4
38	(M) PL S C CB PG CR B W V CT G FG OTHER:	"		Exterior Hand rail	A B C D RM CTR FL CL							0.1
39	M PL S C CB PG CR B (W) V CT G FG OTHER:	White		Int. Window Wall/Frame	A (B) C D RM CTR FL CL							0.2
40	M PL (W) V CT G FG OTHER:	"		Radiator Cover	A B C D RM CTR FL CL			4				0.1
41	M (PL) S C CB PG CR B W V CT G FG OTHER:	Off White		Wall	(A) B C D RM CTR FL CL		Corr		63			0.3
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							
	M PL S C CB PG CR B W V CT G FG OTHER:				A B C D RM CTR FL CL							

Side: Left/Center/Right; Height: Lower/Middle/Upper; Substrate: M: Metal; PL: Plaster; S: Sheetrock; C: Concrete; CB: Cinder Block; CR: Sinks, Water Closets, etc.; CT: Ceramic Tile; PG: Porcelain-glazed Block; B: Brick; W: Wood; V: Vinyl; FG: Fiberglass; G: Glass; Condition: I = Intact; F = Fair; P = Poor; Initial Result: P = Positive; N = Negative;

XRF CALIBRATION CHECK FORM

PAGE 1 OF 1

PROJ. NO.:	31405320.010	DATE:	08/30/
PROJECT NAME:	Bedford Village ES - SED Surv	INSPECTOR NAME:	J. Garcia & S. Lora
CLIENT:	Bedford CSD	INSPECTOR SIGNATURE:	[signature]
SITE:		PROJ. MANAGER:	A. Sandyor

LOUIS BERGER a WSP USA Company
TELEPHONE #: (212) 612-7900
FAX #: (212) 425-1618
ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014

XRF MAKE/MODEL: RMD LPA-1 (Serial#3675) Heuresis Pb200i (Serial#2150) | LLW#: | JOB#: 0830117

NOTES:

CALIBRATION CHECK – PRIOR TO LEAVING OFFICE

1.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 10.50	TEST #	01	02	03	1.1
	XRF READING	1.1	1.0	1.1	

CALIBRATION CHECK – PRIOR TO LEAVING OFFICE

0.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 10.57	TEST #	04	05	06	0.2
	XRF READING	0.3	0.2	0.1	

CALIBRATION CHECK – FIELD-START

1.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 11:30	TEST #	42	43	44	1.0
	XRF READING	1.0	1.0	1.0	

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

0.0 mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 11:33	TEST #	45	46	47	0.2
	XRF READING	0.2	0.2	0.3	

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

______ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ______	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

______ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ______	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

______ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: ______	TEST #				
	XRF READING				

XRF LEAD-BASED PAINT TESTING DATA SHEET/CHAIN OF CUSTODY

PROJECT NO.: 31405320.010
CLIENT: Bedford CSD
INSPECTOR(S): J Wong & S Garcia
PROJ. MANAGER: A. Smolyar

PROJECT NAME: Bedford Village ES
PROJECT LOCATION:
INSPECTION DATE: 08/30/2022

SPACE CHARACTERISTICS:
FLOOR #: _____ ROOM #: _____ ROOM NAME: _____

NOTES:

SAMPLE #	SUBSTRATE	COMPONENT DISCRIPTION: COLOR	CONDITION [I/F/P]	COMPONENT	WALL/SIDE DESIGN.	SIDE [L/C/R]	HEIGHT [L/M/U]	COMPONENT REPLICANT	QUANTITY (IF POSITIVE) [SF]	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	XRF READING [mg/cm²]
07	M (PL) S C CB PG CR B W V CT G FG OTHER:	Wh. Tile		Wall	A B C (D) RM CTR FL CL			Room	64			0.2
08	M PL (S) C CB PG CR B W V CT G FG OTHER:	Brown		Wall	(A) B C D RM CTR FL CL							0.6
09	M PL S C (CB) PG CR B W V CT G FG OTHER:	Wh. Lp		Wall	A B C (D) RM CTR FL CL			Corridor	62			2.5
10	M PL S C CB PG CR B (W) V CT G FG OTHER: Base	"		Wall/Trim	A B C (D) RM CTR FL CL							0.1
11	M PL S C CB PG CR B W V CT G FG OTHER: Glazed Brown	Brown		Wall	A B C (D) RM CTR FL CL							10.5
12	M PL (S) C CB PG CR B W V CT G FG OTHER:	Wh. Lp		Wall	(A) B C D RM CTR FL CL							0.4
13	M PL S C (CB) PG CR B W V CT G FG OTHER:	Light Blue		Wall	A B (C) D RM CTR FL CL			Corridor	14			0.4
14	M PL S (C) CB PG CR B W V CT G FG OTHER:	Blue		Wall Strip	A B (C) D RM CTR FL CL				/			1.5
15	M PL S C CB PG CR B W V CT G FG OTHER: Glazed Brown	Brown		Wall	A B C D RM CTR FL CL				↓			1.2
16	M PL (S) C CB PG CR B W V CT G FG OTHER:	Wh. Tile		Wall	(A) B C D RM CTR FL CL			Art Rm	17			0.1
17	M PL (S) C CB PG CR B W V CT G FG OTHER:	Light Green		Wall	A B C (D) RM CTR FL CL			Rm	15			0.2
18	M PL (S) C CB PG CR B W V CT G FG OTHER: Compress Board	Light Blue		Wall-Board	A B C (D) RM CTR FL CL			"	78			1.7
19	M (PL) S C CB PG CR B W V CT G FG OTHER:	"		Wall	A B C D RM CTR FL CL				↓			0.2
20	M PL S C CB PG CR (B) W V CT G FG OTHER:	"		Wall	A B C (D) RM CTR FL CL			Corridor	143			0.1
21	M PL (S) C CB PG CR B W V CT G FG OTHER:	"		"	A B C D RM CTR FL CL				↓			0.1
22	M PL (S) C CB PG CR B W V CT G FG OTHER:	Tan		"	A B C (D) RM CTR FL CL			Classroom		01		0.1
23	M PL S C CB PG CR B W V CT G FG OTHER: Wall Paper	Light Blue		Wall	A B C (D) RM CTR FL CL			Rm	21			0.3
24	M PL (S) C CB PG CR B W V CT G FG OTHER:	Beige		Way	A B C (D) RM CTR FL CL			Rm	23			0.0
25	M PL S C (CB) PG CR B W V CT G FG OTHER:	Beige		Way	A B C (D) RM CTR FL CL			Rm	28			0.5
26	M PL (S) C CB PG CR B W V CT G FG OTHER:	Light Blue		Way	A B C (D) RM CTR FL CL			Rm	24			0.1

Side: Left/Center/Right; Height: Lower/Middle/Upper; Substrate: M: Metal; PL: Plaster; S: Sheetrock; C: Concrete; CB: Cinder Block; CR: Sinks, Water Closets, etc.; CT: Ceramic Tile; PG: Porcelain-glazed Block; B: Brick; W: Wood; V: Vinyl; FG: Fiberglass; G: Glass ; Condition: I = Intact; F = Fair; P = Poor; Initial Result: P = Positive; N = Negative;

APPENDIX F:
PCB BULK SAMPLE FIELD DATA SHEETS WITH CHAIN OF CUSTODY & LABORATORY RESULTS

Technical Report

prepared for:

WSP USA (New York, NY)
One Penn Plaza, 2nd Floor
New York NY, 10119
Attention: Alexander Smolyar

Report Date: 09/20/2022
Client Project ID: 31405320.010
York Project (SDG) No.: 22I0264

CT Cert. No. PH-0723 New Jersey Cert. No. CT005 and NY037 New York Cert. Nos. 10854 and 12058 PA Cert. No. 68-04440

120 RESEARCH DRIVE STRATFORD, CT 06615 ■ 132-02 89th AVENUE RICHMOND HILL, NY 11418
www.YORKLAB.com (203) 325-1371 FAX (203) 357-0166 ClientServices@yorklab.com

Report Date: 09/20/2022
Client Project ID: 31405320.010
York Project (SDG) No.: 22I0264

WSP USA (New York, NY)
One Penn Plaza, 2nd Floor
New York NY, 10119
Attention: Alexander Smolyar

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on September 07, 2022 and listed below. The project was identified as your project: **31405320.010**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Sample and Analysis Qualifiers section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the Sample and Data Qualifiers Relating to This Work Order section of this report and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
22I0264-01	01 01/02/03	Caulk	09/06/2022	09/07/2022

General Notes for York Project (SDG) No.: 22I0264

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All analyses conducted met method or Laboratory SOP requirements. See the Sample and Data Qualifiers Section for further information.
6. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
7. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.
8. Analyses conducted at York Analytical Laboratories, Inc. Stratford, CT are indicated by NY Cert. No. 10854; those conducted at York Analytical Laboratories, Inc., Richmond Hill, NY are indicated by NY Cert. No. 12058.

Approved By: Cassie L. Mosher **Date:** 09/20/2022

Cassie L. Mosher
Laboratory Manager

Sample Information

Client Sample ID: 01 01/02/03 **York Sample ID:** 22I0264-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22I0264	31405320.010	Caulk	September 6, 2022 3:00 pm	09/07/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.388	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:10	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.388	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:10	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.388	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:10	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.388	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:10	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.388	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:10	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.388	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:10	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.388	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/20/2022 16:10	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.388	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,NJDEP	09/20/2022 16:10	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.388	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,NJDEP	09/20/2022 16:10	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.388	1	EPA 8082A Certifications:	09/20/2022 08:24	09/20/2022 16:10	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*91.5 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*107 %*	*30-140*

Analytical Batch Summary

Batch ID: BI20998 **Preparation Method:** EPA 3550C **Prepared By:** KEO

YORK Sample ID	Client Sample ID	Preparation Date
22I0264-01	01 01/02/03	09/20/22
BI20998-BLK1	Blank	09/20/22
BI20998-BS1	LCS	09/20/22
BI20998-BSD1	LCS Dup	09/20/22

Polychlorinated Biphenyls by GC/ECD - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BI20998 - EPA 3550C											
Blank (BI20998-BLK1)								Prepared & Analyzed: 09/20/2022			
Aroclor 1016	ND	0.455	mg/kg								
Aroclor 1221	ND	0.455	"								
Aroclor 1232	ND	0.455	"								
Aroclor 1242	ND	0.455	"								
Aroclor 1248	ND	0.455	"								
Aroclor 1254	ND	0.455	"								
Aroclor 1260	ND	0.455	"								
Aroclor 1262	ND	0.455	"								
Aroclor 1268	ND	0.455	"								
Total PCBs	ND	0.455	"								
Surrogate: Tetrachloro-m-xylene	*1.74*		*"*	*1.82*		*95.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*2.14*		*"*	*1.82*		*118*	*30-140*				
LCS (BI20998-BS1)								Prepared & Analyzed: 09/20/2022			
Aroclor 1016	9.77	0.455	mg/kg	9.09		107	40-130				
Aroclor 1260	10.3	0.455	"	9.09		113	40-130				
Surrogate: Tetrachloro-m-xylene	*1.81*		*"*	*1.82*		*99.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*2.28*		*"*	*1.82*		*126*	*30-140*				
LCS Dup (BI20998-BSD1)								Prepared & Analyzed: 09/20/2022			
Aroclor 1016	8.06	0.455	mg/kg	9.09		88.7	40-130		19.1	25	
Aroclor 1260	8.96	0.455	"	9.09		98.5	40-130		13.9	25	
Surrogate: Tetrachloro-m-xylene	*1.59*		*"*	*1.82*		*87.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*1.94*		*"*	*1.82*		*106*	*30-140*				
Batch Y2I1942 - BI20998											
Aroclor Reference (Y2I1942-ARC1)								Prepared & Analyzed: 09/19/2022			
Surrogate: Tetrachloro-m-xylene	*0.200*		*ug/mL*	*0.200*		*100*					
Surrogate: Decachlorobiphenyl	*0.184*		*"*	*0.200*		*92.0*					

Sample and Data Qualifiers Relating to This Work Order

Definitions and Other Explanations

*	Analyte is not certified or the state of the samples origination does not offer certification for the Analyte.
ND	NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
LOQ	LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence. This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon NELAC 2009 Standards and applies to all analyses.
LOD	LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.
MDL	METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.
Reported to	This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two. For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the LOD/MDL, with values between the LOD/MDL and the LOQ being "J" flagged as estimated results.

For analyses by EPA SW-846-8270D, the Limit of Quantitation (LOQ) reported for benzidine is based upon the lowest standard used for calibration and is not a verified LOQ due to this compound's propensity for oxidative losses during extraction/concentration procedures and non-reproducible chromatographic performance.

PCB SURVEY DATA SHEET/ CHAIN OF CUSTODY

WSP PROJ #: 31405320.010
CLIENT: Bedford Central School District
Project Site: Bedford Village ES, 45 Court Road, Bedford, NY 10506
Project Manager: Alex Smolyar

LOCATION(S) SURVEYED: 1st Floor & Exterior Main Entrance
PROPOSED PROJECT : SED Survey
DATE(S) OF INSPECTION: 08/30/2022
Inspector(s) Josue Garcia & J. Wong

22ID0264

WSP
TELEPHONE N0. : (212) 612-7900 **FAX N0.: (212) 363-4341**
ADDRESS: 96 Morton Street, 8 Floor, New York, NY 10014

RESULTS TO:

TURNAROUND TIME:
☐48 HR ☐72 H R ☐96 HR X 120 HR

LAB SAMPLE NO.	HA	SAMPLE NO.	MATERIAL DESCRIPTION	SAMPLE LOCATION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
	01	01	First Floor Main Entrance	Exterior Floor Expansion		
		02	↓	Joint Caulking Gray		
		03	↓	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)			Relinquished by (print)	(Sign)			Relinquished by (print)	(Sign)		
J Garcia		9/6/22	AM/PM	Andrew S. Yore		9/7/22	1256 AM/PM			/ /	AM/PM
Received by: (print)	(Sign)			Received by: (print)	(Sign)			Received by: (print)	(Sign)		
Andrew S. Yore		9/7/22	9:50 AM/PM			/ /	AM/PM		9/7/22 1256	/ /	AM/PM

LAB INSTRUCTIONS: create one (1) composite sample of each homogeneous material from equal mass portions (± 5%) of the three (3) sub-samples for extraction and analysis via EPA Method 8082 and report the Arochlors listed (Arochlor 1016, Arochlor 1221, Arochlor 1232, Arochlor 1242, Arochlor 1248, Arochlor 1254, Arochlor 1260). The laboratory shall target a PCB detection limit of 1 ppm

5.3°C

APPENDIX G:
COMPANY LICENSE, PERSONAL CERTIFICATIONS AND LABORATORY ACCREDITATIONS

New York State – Department of Labor
Division of Safety and Health
License and Certificate Unit
State Campus, Building 12
Albany, NY 12240

ASBESTOS HANDLING LICENSE

WSP USA Solutions Inc.
4th Floor
One Penn Plaza

New York, NY 10119

FILE NUMBER: 19-132876
LICENSE NUMBER: 132876
LICENSE CLASS: RESTRICTED
DATE OF ISSUE: 03/31/2022
EXPIRATION DATE: 03/31/2023

Duly Authorized Representative – Craig Napolitano:

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Amy Phillips, Director
For the Commissioner of Labor

SH 432 (8/12)

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2023
Issued April 01, 2022

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MS. JACKIE DARVISH
ATLAS ENVIRONMENTAL LABS CORP
255 W 36TH STREET SUITE 1503
NEW YORK, NY 10018

NY Lab Id No: 11999

is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:

Miscellaneous

Asbestos in Friable Material	Item 198.1 of Manual
	EPA 600/M4/82/020
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)
Asbestos in Non-Friable Material-TEM	Item 198.4 of Manual
Asbestos-Vermiculite-Containing Material	Item 198.8 of Manual
Lead in Dust Wipes	EPA 7000B
Lead in Paint	EPA 7000B

Sample Preparation Methods

EPA 3050B

Serial No.: 64911

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Atlas Environmental Lab (Asbestos in Bulk)
255 W 36th Street Suite #1503
New York, NY 10018
Ms. Jackie Darvish
Phone: 212-563-0400 Fax: 212-563-0401
Email: jdarvish@atlasenvironmentallab.com
http://www.atlasenvironmentallab.com

ASBESTOS FIBER ANALYSIS — NVLAP LAB CODE 500092-0

Bulk Asbestos Analysis

Code	*Description*
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

Code	*Description*
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

For the National Voluntary Laboratory Accreditation Program

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 500092-0

Atlas Environmental Lab (Asbestos in Bulk)

New York, NY

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2021-10-01 through 2022-09-30

Effective Dates

For the National Voluntary Laboratory Accreditation Program

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

Atlas Environmental Lab

255 W 36th Street, Suite 1503, New York, NY 10018

Laboratory ID: LAP-208306

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA LAP), LLC accreditation to the ISO/IEC 17025:2017 international standard, General Requirements for the Competence of Testing and Calibration Laboratories in the following:

LABORATORY ACCREDITATION PROGRAMS

☑	**INDUSTRIAL HYGIENE**	Accreditation Expires: August 01, 2023
☑	**ENVIRONMENTAL LEAD**	Accreditation Expires: August 01, 2023
☑	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires: August 01, 2023
☐	**FOOD**	Accreditation Expires:
☐	**UNIQUE SCOPES**	Accreditation Expires:

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached Scope of Accreditation. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2017 and AIHA LAP, LLC requirements. This certificate is not valid without the attached Scope of Accreditation. Please review the AIHA LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

Cheryl O. Morton

Cheryl O Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision19.1: 07/28/2021

Date Issued: 07/28/2021

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2023
Issued April 01, 2022

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. ROBERT Q. BRADLEY
YORK ANALYTICAL LABORATORIES INC
120 RESEARCH DRIVE
STRATFORD, CT 06615

NY Lab Id No: 10854

is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards (2016) for the category ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved analytes are listed below:

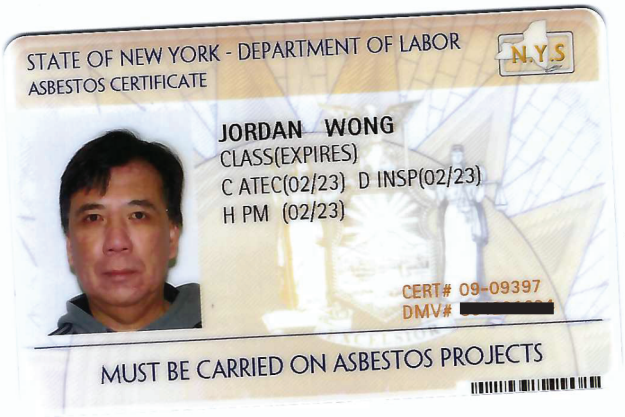
Polychlorinated Biphenyls

Aroclor 1016 (PCB-1016)	EPA 8082A
Aroclor 1016 (PCB-1016) in Oil	EPA 8082A
Aroclor 1221 (PCB-1221)	EPA 8082A
Aroclor 1221 (PCB-1221) in Oil	EPA 8082A
Aroclor 1232 (PCB-1232)	EPA 8082A
Aroclor 1232 (PCB-1232) in Oil	EPA 8082A
Aroclor 1242 (PCB-1242)	EPA 8082A
Aroclor 1242 (PCB-1242) in Oil	EPA 8082A
Aroclor 1248 (PCB-1248)	EPA 8082A
Aroclor 1248 (PCB-1248) in Oil	EPA 8082A
Aroclor 1254 (PCB-1254)	EPA 8082A
Aroclor 1254 (PCB-1254) in Oil	EPA 8082A
Aroclor 1260 (PCB-1260)	EPA 8082A
Aroclor 1260 (PCB-1260) in Oil	EPA 8082A
Aroclor 1262 (PCB-1262)	EPA 8082A
Aroclor 1262 (PCB-1262) in Oil	EPA 8082A
Aroclor 1268 (PCB-1268)	EPA 8082A
Aroclor 1268 (PCB-1268) in Oil	EPA 8082A

Polynuclear Aromatic Hydrocarbons

Acenaphthene	EPA 8270D
	EPA 8270E
Acenaphthylene	EPA 8270D

Serial No.: 65074


STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE
N.Y.S
JORDAN WONG
CLASS(EXPIRES)
C ATEC(02/23) D INSP(02/23)
H PM (02/23)
CERT# 09-09397
DMV# [redacted]
MUST BE CARRIED ON ASBESTOS PROJECTS

United States Environmental Protection Agency

This is to certify that

Jordan Wong

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Risk Assessor

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires January 11, 2025

LBP-R-I183144-2

Certification #

November 22, 2021

Issued On

Ben Conetta, Chief

Chemicals and Multimedia Programs Branch

STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE

N.Y.S.

JOSUE GARCIA
CLASS(EXPIRES)
C ATEC(08/22) D INSP(08/22)
H PM (08/22) I PD (08/22)

CERT# 01-04282
DMV# 815004194

MUST BE CARRIED ON ASBESTOS PROJECTS

United States Environmental Protection Agency

This is to certify that

Josue Garcia

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Risk Assessor

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires April 09, 2023

LBP-R-6928-2
Certification #

January 28, 2020
Issued On

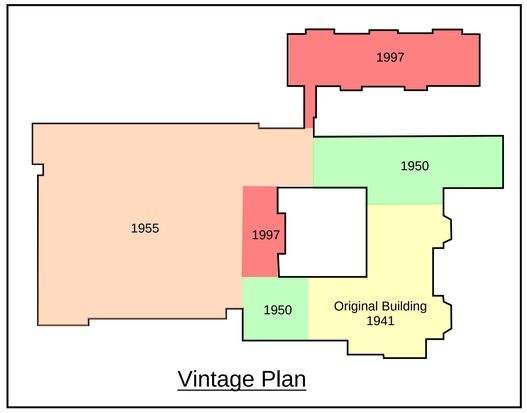
Susan Schulz, Acting Chief
Chemicals and Multimedia Programs Branch

APPENDIX H:
SCOPE OF WORK DRAWINGS

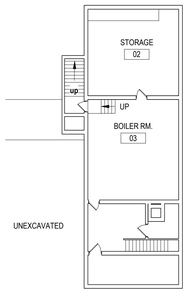
Bedford Village ES - Phase 1 Projects - Scope of Work

1.23	Bedford Village Elementary School	BVES A-13	Provide new security window and fire shutter. Provide new security film to entry door glazing. Provide sliding tray below window
1.24	Bedford Village Elementary School	BVES E-5	Replace outdate clock system
1.25	Bedford Village Elementary School	BVES E-6	Update fire alarm system to include additional smoke detectors in corridors, exterior horns at play areas and exterior strobes
1.26	Bedford Village Elementary School	BVES E-8	Replace building wide PA system

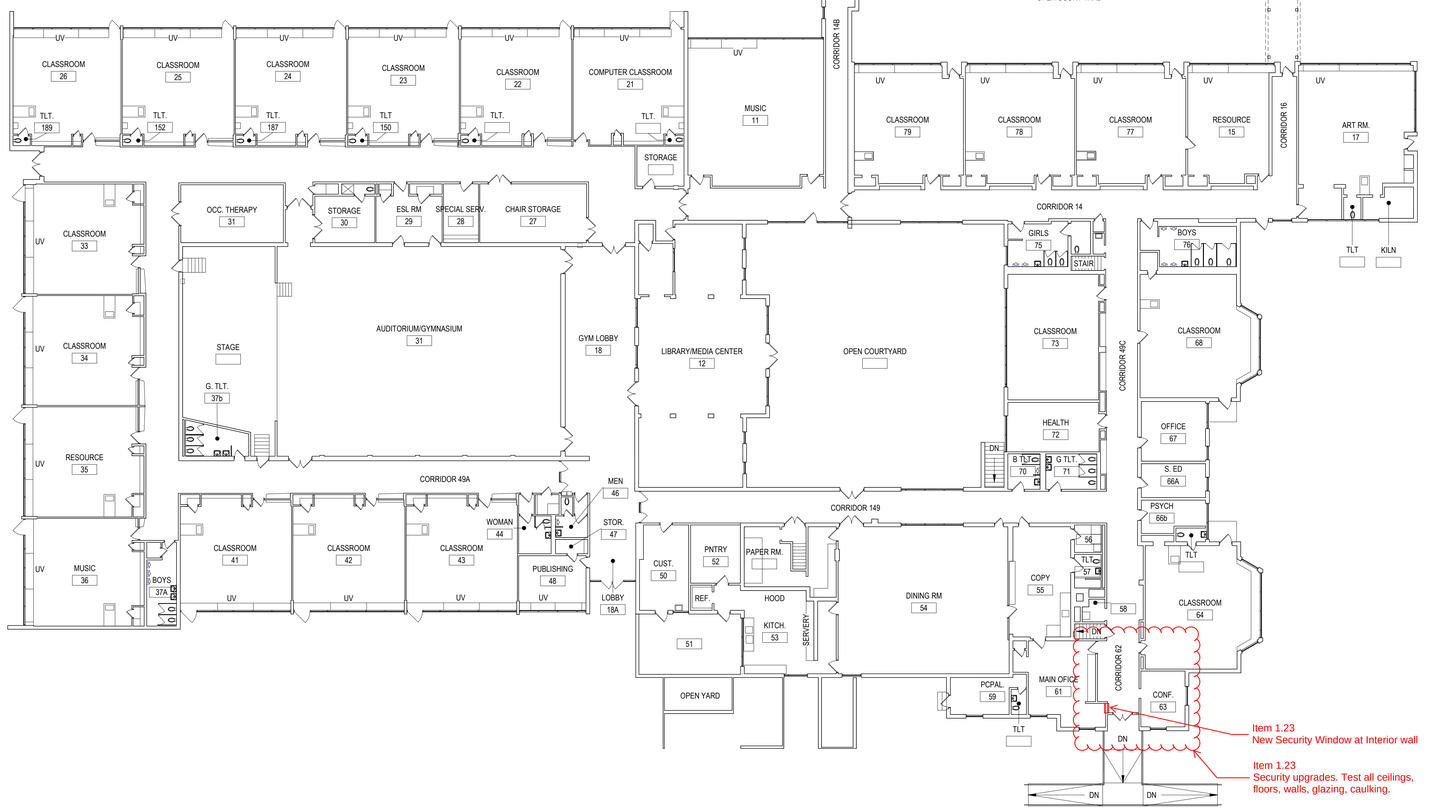
Items 1.24-1.26
Test suspect ceilings and walls in each building addition for classrooms and corridors.



Vintage Plan



2 EXISTING LOWER LEVEL PLAN
SCALE: 1/16" = 1'-0"



1 EXISTING FIRST FLOOR PLAN
SCALE: 1/16" = 1'-0"

EXISTING FLOOR PLANS
BEDFORD VILLAGE ELEMENTARY SCHOOL
BEDFORD CSD

02/02/21

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS

APPENDIX I:
FILE SEARCH

ASBESTOS TRIENNIAL INSPECTION REPORT

for

BEDFORD VILLAGE ELEMENTARY SCHOOL

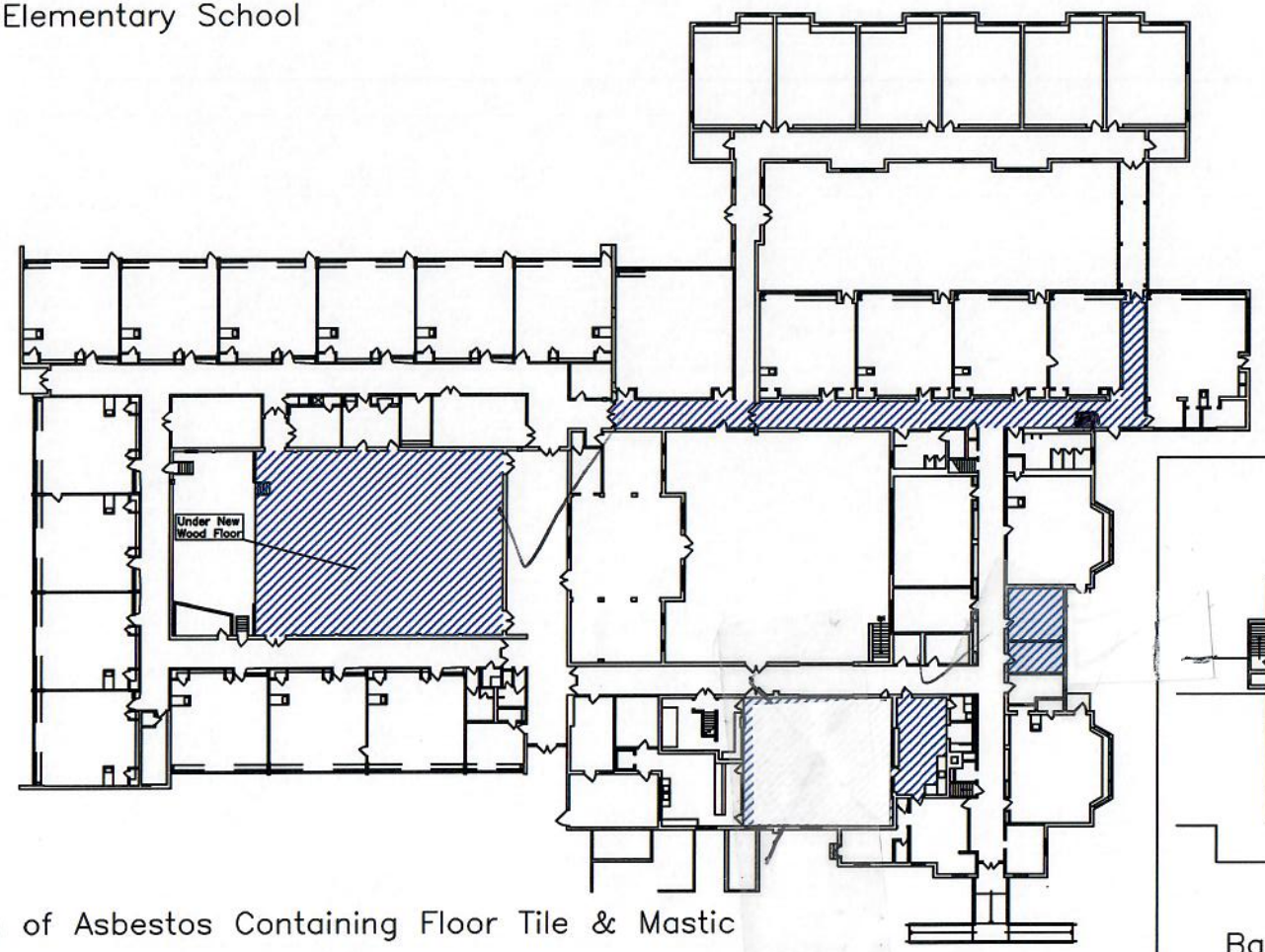
BEDFORD CENTRAL SCHOOL DISTRICT
Fox Lane Campus
Mount Kisco, New York 10528

by

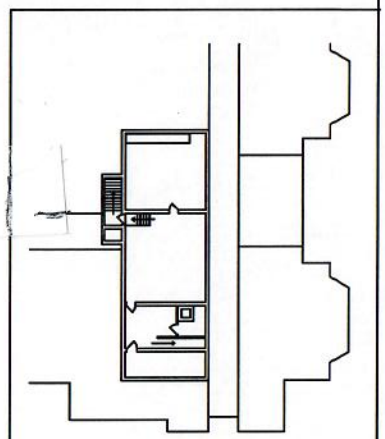
S & B ENVIRONMENTAL, LLC
7 Fairchild Road
Newtown, CT. 06470

12 May 2019

Bedford Village Elementary School
First Floor



Location of Asbestos Containing Floor Tile & Mastic



Basement

FINAL REPORT OF ENVIRONMENTAL SERVICES

Performed at:

POUND RIDGE ELEMENTARY SCHOOL
SED SURVEY PROJECT
7 POUND RIDGE RD
POUND RIDGE, NY 10576

Prepared for:

BEDFORD CENTRAL SCHOOL DISTRICT

Inspiring and Challenging Our Students

632 South Bedford Road
Bedford, NY 10506

Prepared by:

WSP USA Solutions, Inc.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
Tel. (914) 747-1120

Project No. 31405320.014
Final Submission Date: September 26, 2022

September 26, 2022

Mr. Dennis Rankin
Director of Facilities
Bedford Central School District
632 South Bedford Road
Bedford, NY 10506

Subject: **Final Report of Environmental Services**
Phase 1 Project
Pound Ridge Elementary School
7 Pound Ridge Rd,
Pound Ridge, NY 10576

Dear Mr. Rankin:

WSP USA Solutions, Inc. has completed a material inspection at the Pound Ridge Elementary School located at 7 Pound Ridge Rd, Pound Ridge 10576. The inspection included visual observation, material sampling, and laboratory sample analysis of suspect Asbestos-Containing Materials (ACM), Lead Based Paints (LBP) and Polychlorinated Biphenyls (PCBs) as part of the SED Survey project at the Pound Ridge Elementary School.

The attached report presents descriptions and results of the material sampling procedures and visual analysis. Relevant general project information is provided, followed by our findings, assessments and recommendations. Laboratory analysis data and certifications are provided in the Appendices.

If you have any questions concerning this report or if we may be of further assistance to you, please contact us.

Sincerely,

WSP USA SOLUTIONS, INC.

Steven Eget, PE
Vice President, Earth & Environment Downstate NY Business Line Leader

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1.0 EXECUTIVE SUMMARY

WSP USA, Inc. has performed a material inspection for the presence or absence of Asbestos-Containing Materials (ACM), Lead Based Paints (LBP) and Polychlorinated Biphenyls (PCBs) at the Pound Ridge Elementary School located at 7 Pound Ridge Rd, Pound Ridge, NY 10576. The intent of this inspection was to screen for ACM, LBP and PCBs that may be impacted during the SED Survey project at the school noted above.

Willians NG-Feng and Stephen Gruber of WSP performed this inspection on September 13, 2022. Mr. NG-Feng is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert# 14-09012). Mr. Gruber is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert# 17-42557) and a licensed New York State EPA Lead Inspector (Cert# LBP-I-I219874-1).

The results of the visual inspection and bulk sample analysis determined that the following suspect ACM, LBP and PCB materials may be impacted by the proposed SED Survey project at the school noted above:

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 09/13/2022 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **None**

The following materials are **Assumed to Contain Asbestos as per AHERA Report:**

- **Floor Tile and Mastic (Not Currently Affected by Scope Of Work)**
- **Mastic Associated with Homosote Walls & Blackboards**

Analytical results of the bulk samples collected on 09/13/2022 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Drywall (White) - (First Floor)
- Joint Compound (White) - (First Floor)
- Ceiling Tile 2’x2’ (White) - (First Floor)
- Carpet Mastic (Beige) - (First Floor)
- Green Cove Base - (First Floor)
- Cove Base Mastic (Beige) - (First Floor)
- Green Speckle 12”x12” Floor Tile - (First Floor)
- Blue Speckle - (First Floor)
- Black Mastic Speckle of Green Speckle and Blue Floor Tile - (First Floor)
- Ceiling Glue Dot (Brown) - (First Floor)
- Ceramic Black Mortar - (First Floor)
- White Caulking Around Door Frame - (First Floor)
- Ceiling White Coat Plaster - (First Floor)

- Ceiling Brown Coat Plaster - (First Floor)
- Brick Mortar (Grey) - (First Floor)
- Cinder Block Mortar (Grey) - (First Floor)
- Grey Fiberboard Walls - (First Floor)
- Wall White Coat Plaster - (First Floor)
- Wall Brown Coat Plaster - (First Floor)
- Fiberboard Column (White) - (First Floor)
- Grey Caulking on Concrete - (First Floor)

B. LEAD-BASED PAINT

Based upon XRF readings, lead has been confirmed to exist in the following tested combinations:

- **Blue Paint on Plaster Wall (Project Meeting, Room 10 And Interior Rooms Throughout Original Building 1939)**
- **Off White Paint on Plaster Wall (Room Boces 30 And Interior Rooms Throughout Original Building 1939)**

Lead was **not detected** in the following tested combinations via XRF readings:

- White Paint on Gypsum Wall (1st Floor Library)
- White Paint on Metal Window Frame (1st Floor Library)
- Creme Paint on Gypsum Wall (1st Floor Corridor By Room 64)
- Purple Paint on Gypsum Wall (1st Floor Computer Room 65)
- Creme Paint on Metal Door Frame (1st Floor Computer Room 65)
- White Paint on Gypsum Wall (1st Floor Computer Room 65)
- White Paint on Gypsum Soffit (1st Floor Kindergarten Room 70)
- White Paint on Wood Wall (1st Floor, 1st Grade Room 72)
- Yellow Paint on Wood Wall (1st Floor, 1st Grade Room 72)
- Off White Paint on Gypsum Wall (1st Floor, 1st Grade Room 72)
- Creme Paint on Cinder Block Wall (1st Floor Corridor By Room 39)
- Creme Paint on Gypsum Wall (1st Floor Corridor By Room 39)
- Light Blue Paint on Cinder Block Wall (1st Floor Music Room 52)
- Light Blue Paint on Gypsum Wall (1st Floor Music Room 52)
- White Paint on Cinder Block Wall (1st Floor Music Storage Room 53)
- Light Blue Paint on Brick Wall (1st Floor Storage Room 60)
- Off White Paint on Plaster Wall (1st Floor Boces Room 30)
- Creme Paint on Plaster Wall (1st Floor Specialist Room 33)
- White Paint on Gypsum Wall (1st Floor Specialist Room 33A)
- Gray Paint on Plaster Wall (1st Floor Specialist Room 33A)
- Creme Paint on Gypsum Wall (1st Floor Vestibule Room 6A)
- White Paint on Gypsum Ceiling (1st Floor Vestibule Room 6A)
- Off White Paint on Plaster 2nd Ceiling (1st Floor Vestibule Room 6A)

- Crème Paint on Concrete Wall (1st Floor Corridor Near Room 36)
- White Paint on Wood Window Frame (1st Floor Office 5)
- Crème Paint on Gypsum Wall (1st Floor Office 5)
- White Paint on Metal Door Frame (1st Floor Office 5)
- Blue Paint on Plaster Wall (1st Floor Project Meeting Room 10)
- Blue Paint on Wood Notice Board (1st Floor Project Meeting Room 10)
- White Paint on Plaster Column (1st Floor, External Main Entry)
- White Paint on Metal Door Frame (1st Floor, External Main Entry)
- White Paint on Plaster Wall (1st Floor Aides 7)
- Crème Paint on Cinder Block Wall (1st Floor, 5th Grade Room 13)
- Blue Paint on Wood Partition Wall (1st Floor, 5th Grade Room 13)
- White Paint on Wood Wall (1st Floor OP/PT Room 47A)
- Crème Paint on Brick Wall (1st Floor Corridor Near Room 42)
- Light Green Paint on Cinder Block Wall (Basement, Faculty Lounge Room76)
- Light Green Paint on Gypsum Wall (Basement, Faculty Lounge Room76)
- Orange Paint on Gypsum Wall (1st Floor, Cafeteria Room 38)

C. PCB-CONTAINING MATERIAL

Analytical results of the bulk samples collected indicate that the following materials **contain PCB** (greater than 50 PPM):

- **None**

Analytical results of the bulk samples collected indicate that the following materials **did not contain PCB** (less than 50 PPM):

- Caulking Around Door Frame (White) - (Front Entrance Vestibule Ground Floor))
- Caulking on Concrete Floor (Grey) - (Main Entrance Exterior Ground Floor)

2.0 FIELD INSPECTION PROCEDURES AND SAMPLE ANALYSIS METHODS

A. ASBESTOS-CONTAINING MATERIAL

Guidelines used for the inspection were established by the Environmental Protection Agency (EPA) in the Guidance for Controlling Asbestos Containing Materials in Buildings, Office of Pesticides and Toxic Substances, Doc 560/5-85-024, and 40 CFR Part 763, Asbestos Hazard Emergency Response Act (AHERA).

Field information was organized in accordance with the AHERA methodology of homogenous area (HA). During the Inspection, reasonable effort was made to identify all locations and types of ACM materials associated with the scope of work. Sampling has included multiple samples of the same materials chosen at random. However, due to inconsistencies of a manufacturer's processes and the contractor's installation methods, materials of similar construction may contain various amounts of asbestos. Furthermore, some materials that were not originally specified to contain asbestos may in fact contain this mineral. For example, cementitious pipe insulation and plaster were frequently mixed with asbestos at the construction site for ease of application. Locating all asbestos materials can only be definitively achieved by conducting exploratory demolition and sampling every section of pipe insulation, fitting or valve coveing, fireproofing, and other suspect ACM.

Bulk samples of suspect ACM are analyzed using polarized light microscopy (PLM) coupled with dispersion staining, as described in 40 CFR Part 763 and the National Emissions Standard for Hazardous Air Pollutants (NESHAPS). NESHAPS is the standard industry protocol for the determination of asbestos in building materials. A suspect material is immersed in a solution of known refractive index and subjected to illumination by polarized light. The color displays that result are compared to a standardized atlas whereby the specific variety of asbestos is determined. It should also be recognized that PLM is primarily a qualitative identification method whereby asbestos percentage, if any, is estimated. While EPA, New York State, and New York City regulations governing ACM consider materials containing greater then 1-percent as asbestos, accurately quantifying asbestos content below 5-percent has been shown to be unreliable.

The New York State Department of Health has recently revised the PLM Stratified Point Counting Method. The March 25th, 2011 method, "Polarized Light Microscopy Methods for Identifying and Quantifying Asbestos in Bulk Samples" can be found as Item 198.1 in the Environmental Laboratory Approval program (ELAP) Certification manual. Whereas the procedure of analysis for bulk samples that fall into the category of "Non-friable Organically Bound" (NOB) can be found in the March 25th 2011 method "Polarized-Light Microscope Method for Identifying and Quantifying Asbestos in Non-Friable Organically Bound Bulk Samples", Item 198.6 in the ELAP Certification Manual. This category includes any sample in a flexible to rigid asphalt or vinyl matrix (floor tiles, mastic, roofing shingles, roofing felt, etc.). These samples must be "ashed" in a muffle furnace at 480-degrees Celsius (to remove organic matrix), treated with acid (to remove any mineral carbonate), and filtered through a 0.4-micron polycarbonate filter before being analyzed by PLM. The sample must be weighted between each of these steps to track the percent loss of organic matrix.

ELAP has determined that analysis of NOB materials is not reliably performed by PLM.

Therefore, if PLM analysis yields results of 1-percent asbestos or less, the result must be confirmed by TEM. For bulk samples that undergo TEM analysis, the March 25th, 2011 method "Transmission Electron Microscope Method for Identifying and Quantitating Asbestos in Non-Friable organically Bound Bulk Samples" must be used and can be found as Item 198.4 in the ELAP Certification Manual. ELAP certified laboratories must include the following statement with their PLM analysis results for each "negative" (1-percent or less asbestos) NOB sample: "Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coveings and similar non-friable organically bound materials. Before this material can be considered or treated as non-ACM, confirmation must be made by quantitative transmission electron microscopy".

All samples are initially analyzed by Polarized Light Microscopy in accordance with Item 198.1 and 198.6 of the ELAP Certification Manual. Samples which yield a negative PLM result and which are classified as a "non-friable" material, are then re-analyzed utilizing TEM methodology in accordance with Item 198.4 of the ELAP Certification Manual. The laboratory performing both these analysis procedures Atlas Environmental Lab, Corp. located at 255 West 36th Street, New York, NY 10018. The laboratory has received accreditation from the following agencies:

- National Voluntary Laboratory Accreditation Program (Lab Code 500092-0)
- New York State Environmental Laboratory Approval Program (Lab No. 11999)
- American Industrial Hygiene Association Accredited Laboratory (Lab No. 208306)

B. LEAD-BASED PAINT

Painted surfaces within the space equivalents in the scope of work were identified and grouped together by component type, substrate and visible color. In similar fashion, the inspection continued in each space equivalent with the identification of unique combinations of component, substrate and visible color. A random representative area of each unique combination was sampled and tested. For each of these designated components, an area on the component was chosen which represents the paint on that building component. During the inspection, components that are accessible surfaces, friction surfaces, impact surfaces, or have deteriorated paint was identified.

The readings of paint surfaces were taken using Heuresis Pb200i XRF Lead Paint Spectrum Analyzers. The Heuresis method of measurement is based on the spectrometric analysis of lead K-shell X-ray fluorescence within a controlled depth of interrogation. The Heuresis Analyzer uses a Co-57 radioactive source and an advanced, solid-state, room temperature, radiation detector to generate and detect the x-ray fluorescence spectrum of a painted surface. The spectrum is then analyzed by a microprocessor to eliminate the effects of substrate and other factors such as scattering to allow an accurate determination of the amount of lead on a surface. The Heuresis 1 automatically analyzes spectrometric data in real time and differentiates the lead signal from the spectrum. The x-ray fluorescence properties are determined through calibration process and are used for automatic substrate correction and calculation of the lead content of a painted surface.

For quality control, the XRF instrument was calibrated using a U.S. Department of Commerce

National Institute of Standards and Technology (NIST) Level III 1.0 mg/cm2 lead based paint film. For each calibration, three (3) XRF readings were taken on the paint film. The average of these three (3) readings was then subtracted from the known lead content in the paint film. The difference was compared with an Environmental Protection Agency (EPA)-approved tolerance range. Such calibration procedures were conducted at the start and at the end of the workday

C. POLYCHLORINATED BIPHENYLS (PCBs)

PCBs belong to a broad family of man-made organic chemicals known as chlorinated hydrocarbons. PCBs were domestically manufactured from 1929 until their manufacture was banned in 1979. They have a range of toxicity and vary in consistency from thin, light-colored liquids to yellow or black waxy solids. Due to their non-flammability, chemical stability, high boiling point, and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics, and rubber products; in pigments, dyes, and carbonless copy paper; and many other industrial applications.

Although no longer commercially produced in the United States, PCBs may be present in products and materials produced before the 1979 PCB ban. Products that may contain PCBs include: Transformers and capacitors, Oil used in motors and hydraulic systems, Fluorescent light ballasts, Adhesives and tapes, Caulking, Plastics, etc.

The PCBs used in these products were chemical mixtures made up of a variety of individual chlorinated biphenyl components, known as congeners. Most commercial PCB mixtures are known in the United States by their industrial trade names. The most common trade name is aroclor.

Polychlorinated biphenyls (PCBs) are regulated pursuant to the United States Environmental Protection Agency Code of Federal Regulations (40 CFR Part 761) and the Toxic Substances Control Act (TSCA – 15 U.S.C. 2605). These regulations require certain testing and reporting requirements to determine management, recycling and disposal options for PCBs.

3.0 INSPECTION SCOPE AND MATERIAL ASSESSMENT

The areas inspected for ACM materials that may be impacted by the proposed SED Survey project at the Pound Ridge Elementary School. Locations surveyed include:

- Throughout Building

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 09/13/2022 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **None**

The following materials are **Assumed to Contain Asbestos as per AHERA Report:**

- **Floor Tile and Mastic (Not Currently Affected By Scope Of Work)**
- **Mastic Associated with Homosote Walls & Blackboards**

Analytical results of the bulk samples collected on 09/13/2022 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Drywall (White) - (First Floor)
- Joint Compound (White) - (First Floor)
- Ceiling Tile 2'x2' (White) - (First Floor)
- Carpet Mastic (Beige) - (First Floor)
- Green Cove Base - (First Floor)
- Cove Base Mastic (Beige) - (First Floor)
- Green Speckle 12"x12" Floor Tile - (First Floor)
- Blue Speckle - (First Floor)
- Black Mastic Speckle of Green Speckle and Blue Floor Tile - (First Floor)
- Ceiling Glue Dot (Brown) - (First Floor)
- Ceramic Black Mortar - (First Floor)
- White Caulking Around Door Frame - (First Floor)
- Ceiling White Coat Plaster - (First Floor)
- Ceiling Brown Coat Plaster - (First Floor)
- Brick Mortar (Grey) - (First Floor)
- Cinder Block Mortar (Grey) - (First Floor)
- Grey Fiberboard Walls - (First Floor)
- Wall White Coat Plaster - (First Floor)
- Wall Brown Coat Plaster - (First Floor)
- Fiberboard Column (White) - (First Floor)
- Grey Caulking on Concrete - (First Floor)

B. LEAD-BASED PAINT

Based upon XRF readings, lead has been confirmed to exist in the following tested combinations:

- **Blue Paint on Plaster Wall (Project Meeting, Room 10 And Interior Rooms Throughout Original Building 1939)**
- **Off White Paint on Plaster Wall (Room Boces 30 And Interior Rooms Throughout Original Building 1939)**

Lead was **not detected** in the following tested combinations via XRF readings:

- White Paint on Gypsum Wall (1st Floor Library)
- White Paint on Metal Window Frame (1st Floor Library)
- Creme Paint on Gypsum Wall (1st Floor Corridor By Room 64)
- Purple Paint on Gypsum Wall (1st Floor Computer Room 65)
- Creme Paint on Metal Door Frame (1st Floor Computer Room 65)
- White Paint on Gypsum Wall (1st Floor Computer Room 65)
- White Paint on Gypsum Soffit (1st Floor Kindergarten Room 70)
- White Paint on Wood Wall (1st Floor, 1st Grade Room 72)
- Yellow Paint on Wood Wall (1st Floor, 1st Grade Room 72)
- Off White Paint on Gypsum Wall (1st Floor, 1st Grade Room 72)
- Creme Paint on Cinder Block Wall (1st Floor Corridor By Room 39)
- Creme Paint on Gypsum Wall (1st Floor Corridor By Room 39)
- Light Blue Paint on Cinder Block Wall (1st Floor Music Room 52)
- Light Blue Paint on Gypsum Wall (1st Floor Music Room 52)
- White Paint on Cinder Block Wall (1st Floor Music Storage Room 53)
- Light Blue Paint on Brick Wall (1st Floor Storage Room 60)
- Off White Paint on Plaster Wall (1st Floor Boces Room 30)
- Creme Paint on Plaster Wall (1st Floor Specialist Room 33)
- White Paint on Gypsum Wall (1st Floor Specialist Room 33A)
- Gray Paint on Plaster Wall (1st Floor Specialist Room 33A)
- Creme Paint on Gypsum Wall (1st Floor Vestibule Room 6A)
- White Paint on Gypsum Ceiling (1st Floor Vestibule Room 6A)
- Off White Paint on Plaster 2nd Ceiling (1st Floor Vestibule Room 6A)
- Crème Paint on Concrete Wall (1st Floor Corridor Near Room 36)
- White Paint on Wood Window Frame (1st Floor Office 5)
- Crème Paint on Gypsum Wall (1st Floor Office 5)
- White Paint on Metal Door Frame (1st Floor Office 5)
- Blue Paint on Plaster Wall (1st Floor Project Meeting Room 10)
- Blue Paint on Wood Notice Board (1st Floor Project Meeting Room 10)
- White Paint on Plaster Column (1st Floor, External Main Entry)
- White Paint on Metal Door Frame (1st Floor, External Main Entry)
- White Paint on Plaster Wall (1st Floor Aides 7)

- Crème Paint on Cinder Block Wall (1st Floor, 5th Grade Room 13)
- Blue Paint on Wood Partition Wall (1st Floor, 5th Grade Room 13)
- White Paint on Wood Wall (1st Floor OP/PT Room 47A)
- Crème Paint on Brick Wall (1st Floor Corridor Near Room 42)
- Light Green Paint on Cinder Block Wall (Basement, Faculty Lounge Room76)
- Light Green Paint on Gypsum Wall (Basement, Faculty Lounge Room76)
- Orange Paint on Gypsum Wall (1st Floor, Cafeteria Room 38)

D. PCB-CONTAINING MATERIAL

Analytical results of the bulk samples collected indicate that the following materials **contain PCB** (greater than 50 PPM):

- **None**

Analytical results of the bulk samples collected indicate that the following materials **did not contain PCB** (less than 50 PPM):

- Caulking Around Door Frame (White) - (Front Entrance Vestibule Ground Floor))
- Caulking on Concrete Floor (Grey) - (Main Entrance Exterior Ground Floor)

4.0 INSPECTION RESULTS

A. ASBESTOS-CONTAINING MATERIAL

The asbestos inspection involved a thorough visual examination of all areas that may be impacted by the proposed SED Survey project at the Pound Ridge Elementary School. The following suspect materials were sampled and analyzed for asbestos content by WSP:

4.1 Table 4.1 – Suspect Materials Inspected

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
WSP Sampled on 08/26/22			
01	First Floor	Drywall (White)	NAD
02	First Floor	Joint Compound (White)	NAD
03	First Floor	Ceiling Tile 2'x2' (White)	NAD
04	First Floor	Carpet Mastic (Beige)	NAD
05	First Floor	Green Cove Base	NAD
06	First Floor	Cove Base Mastic (Beige)	NAD
07	First Floor	Green Speckle 12"x12" Floor Tile	NAD
08	First Floor	Blue Speckle 12"x12" Floor Tile	NAD
09	First Floor	Black Mastic Speckle of Green Speckle and Blue Floor Tile	NAD
10	First Floor	Ceiling Glue Dot (Brown)	NAD
11	First Floor	Ceramic Black Mortar	NAD
12	First Floor	White Caulking Around Door Frame	NAD
13	First Floor	Ceiling White Coat Plaster	NAD
14	First Floor	Ceiling Brown Coat Plaster	NAD
15	First Floor	Brick Mortar (Grey)	NAD
16	First Floor	Cinder Block Mortar (Grey)	NAD
17	First Floor	Grey Fiberboard Walls	NAD
18	First Floor	Wall White Coat Plaster	NAD
19	First Floor	Wall Brown Coat Plaster	NAD
20	Exterior Front Entry	Fiberboard Column (White)	NAD
21	Exterior Front Entry	Grey Caulking on Concrete	NAD
22	Exterior Front Entry Owning	Drywall (White)	NAD

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
AHERA Report			
B	**1st Grade Rooms 32, 33, 34**	**Mastic Associated with Homosote Walls & Blackboards**	**Assumed ACM**
A	**Cafeteria & Storage Rooms 40, 38B, 38A**	**Floor Tiles and Mastic - Not Affected by Current SOW**	**Assumed ACM**

Bold = Positive for ACM NAD = No Asbestos Detected NA/PS = Not analyzed/ positive sample

4.2 CONDITION AND FRIABLITY ASSESSMENT TABLE

For each inspection conducted, the inspector classifies ACM or Assumed ACM materials by friability and condition. This helps to determine the extent of damage in certain areas as well as the potential for further damage and Asbestos release due to disturbance of the material.

Table 4.2 – Condition and Friability Assessment

Location	Material	Quantity	Friability	Condition
1st Grade Rooms 32, 33, 34	Mastic Associated with Homosote Walls & Blackboards	3 SF (1^{SF} Per Room Assumed To Be Impacted By SOW)	Non-Friable	Good

Condition Definitions:
Good: None/Minimal apparent damage to ACM
Fair: Up to 10% localized damage or up to 25% of the entire ACM is damaged
Poor: Over 10% localized damage or over 25% of the entire ACM is damaged

4.3 SAMPLE ANALYSIS TABLE

Laboratory analysis results, in tabular form, are included in Appendix A.

B. LEAD-BASED PAINT

The lead Inspection involved a thorough visual examination of all accessible areas impacted by the proposed SED Survey project at the Pound Ridge Elementary School. The following suspect surfaces were tested for lead content:

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
1	Calibration Check @ 1.0	---	---	---	---	0.9
2	Calibration Check @ 1.0	---	---	---	---	0.9

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
3	Calibration Check @ 1.0	---	---	---	---	1.0
4	Calibration Check @ 0.0	---	---	---	---	-0.1
5	Calibration Check @ 0.0	---	---	---	---	0.0
6	Calibration Check @ 0.0	---	---	---	---	0.1
7	1st Floor Library	Wall	White	sheetrock	Intact	0.1
8	1st Floor Library	Window Frame	White	Metal	Intact	0.1
9	1st Floor Corridor 64	Wall	Creme	Sheetrock	Intact	0.01
10	1st Floor Computer 65	Wall #1	Purple	Sheetrock	Intact	0.01
11	1st Floor Computer 65	Door Frame	Creme	Metal	Intact	0.1
12	1st Floor Computer 65	Wall #2	White	Sheetrock	Intact	0.2
13	Kindergarten 70	Soffit	white	Sheetrock	Intact	0.3
14	1st Grade, 72	Wall	White	Wood	Intact	0.2
15	1st Grade, 72	Wall	Yellow	Wood	Intact	0.2
16	1st Grade, 72	Wall	Off White	Wood	Intact	0.3
17	Corridor 39	Wall	Crème	Cinder Block	Intact	0.2
18	Corridor 39	Wall	Crème	Sheetrock	Intact	0.5
19	Music 52	Wall	Light Blue	Cinder Block	Intact	0.5
20	Music 52	Wall	Light Blue	Sheetrock	Intact	0.3
21	Music Storage 53	Wall	White	Cinder Block	Intact	0.5
22	Storage 60	Wall	Light Blue	Brick	Intact	0.1
23	**Boces 30**	**Wall**	**Off White**	**Plaster**	**Intact**	**1.2**
24	Specialist 33	Wall	Crème	Plaster	Intact	0.1
25	Specialist 33A	Wall	White	Sheetrock	Intact	0.2
26	Specialist 33A	Wall	Gray	Plaster	Intact	0.0
27	1st Floor Vestibule 6A	Wall	Crème	Sheetrock	Intact	0.2
28	1st Floor Vestibule 6A	Ceiling	White	Sheetrock	Intact	0.1
29	1st Floor Vestibule 6A	2nd Ceiling	Off White	Plaster	Intact	0.4
30	1st Floor Corridor 36	Wall	Crème	Concrete	Intact	0.1
31	1st Floor Office 5	Window Frame	White	Wood	Intact	-0.1
32	1st Floor Office 5	Wall	Crème	Sheetrock	Intact	0.2
33	1st Floor Office 5	Door Frame	White	Metal	Intact	0.2

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
34	**1st Floor Project Meeting Room 10**	**Wall**	**Blue**	**Plaster**	**Intact**	**1.6**
36	1st Floor External Main Entry	Column	White	Plaster	Intact	-0.1
37	1st Floor External Main Entry	Door Frame	White	Metal	Intact	-0.2
38	1st Floor Aides 7	Wall	White	Plaster	Intact	0.3
39	1st Floor 5th Grade 13	Wall	Crème	Cinder Block	Intact	0.1
40	1st Floor 5th Grade 14	Partition Wall	Blue	Wood	Intact	0.2
41	1st Floor OP/PT 47a	Wall	White	Wood	Intact	0.1
42	1st Floor Corridor 42	Wall	Crème	Brick	Intact	0.0
43	Basement, Faculty Lounge 76	Wall	Light Green	Cinder Block	Intact	-0.1
44	Basement, Faculty Lounge 76	Wall	Light Green	Sheetrock	Intact	0.1
45	1st Floor Cafeteria 38	Wall	Orange	Sheetrock	Intact	0.2
46	Calibration Check @ 1.0	---	---	---	---	0.8
47	Calibration Check @ 1.0	---	---	---	---	0.7
48	Calibration Check @ 0.0	---	---	---	---	0.8
49	Calibration Check @ 0.0	---	---	---	---	0.1
50	Calibration Check @ 0.0	---	---	---	---	0.1
51	Calibration Check @ 0.0	---	---	---	---	-0.1

C. PCB-CONTAINING MATERIAL

The PCB Inspection involved a thorough visual examination of all areas that may be impacted by the proposed SED Survey project at the Pound Ridge Elementary School. The following suspect materials were tested for PCB content:

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	PCB CONTENT (PPM)
01	Ground Floor	Entrance Vestibule Caulking Around Door Frame (White)	ND
02	Ground Floor	Caulking on Concrete Floor Main Entrance Exterior (Grey)	ND

5.0 AREAS NOT ACCESSIBLE

During the inspection the following areas were not accessible:

Spaces within Walls/Floors/Ceilings: No destructive sampling was performed on concealed spaces in walls to access plenum, chases etc. It should be assumed that asbestos containing materials may exist in these spaces. Any suspect materials encountered during work should be sampled for analysis before work continues.

Building Envelope: No destructive sampling was performed on the building envelope. It should be assumed that asbestos, lead and PCB containing materials may exist in these spaces. Any suspect materials encountered during work should be sampled for analysis before work continues.

6.0 CONCLUSIONS AND RECOMMENDATIONS

ACM & LBP was identified in this inspection that may be impacted as part of the proposed SED Survey project at the Pound Ridge Elementary School.

No PCB have been identified in this inspection that may be impacted as part of the proposed SED Survey project at the Pound Ridge Elementary School.

The ACM, LBP & PCB inspection was conducted at the request of Bedford Central School District for the proposed SED Survey project at the Pound Ridge Elementary School. Any change in the scope of work will require further investigation to accurately classify any additional ACM, LBP or PCBs resulting from the modified or updated scope of work.

7.0 REPORT CERTIFICATIONS

This report, and the supporting data, findings, conclusions, opinions, and recommendations it contains represent the result of WSP's efforts for the environmental inspection work for the Pound Ridge Elementary School, SED Survey project.

Opinions and recommendations presented in this report apply to site conditions and features as they existed at the time of WSP's site visits, and those reasonably foreseeable. They cannot necessarily apply to conditions and features of which WSP is unaware and has not had the opportunity to evaluate.

The conclusions presented in this report are professional opinions solely upon WSP's visual observations of accessible areas, laboratory test data, and current regulatory requirements. These conclusions are intended exclusively for the purpose stated herein and the site indicated for the project indicated.

Prepared by:

Stephen Gruber
NYS DOL Inspector

Reviewed by:

Steven Eget, PE
Vice President

APPENDIX A:
ASBESTOS SAMPLE ANALYSIS RESULTS IN TABULAR FORM

APPENDIX A
SAMPLE ANALYSIS RESULTS IN TABULAR FORM
POUND RIDGE ELEMENTARY SCHOOL
SED SURVEY PROJECT
7 POUND RIDGE RD
POUND RIDGE, NY 10576

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
WSP Sampled on 08/26/2022					
01	01	Library, Work Room 75B	Drywall (White)	NAD	N/A
	02	Library, Opposite end of Work Room 75		NAD	N/A
02	03	Library, Work Room 75B	Joint Compound (White)	NAD	N/A
	04	Library, Opposite End of Work Room 75		NAD	N/A
03	05	Library Work Room 75B	Ceiling Tile 2'x2' (White)	NAD	N/A
	06	Lobby 6		NAD	N/A
04	07	Library 75 by South Exit	Carpet Mastic (Beige)	NAD	N/A
	08	Library 75 NE Side		NAD	N/A
05	09	Library 75 by South Exit	Green Cove Base	NAD	N/A
	10	Library 75 NE Side		NAD	N/A
06	11	Library 75 by South Exit	Cove Base Mastic (Beige)	NAD	N/A
	12	Library 75 NE Side		NAD	N/A
07	13	Main Entrance Vestibule 6A	Green Speckle 12"x12X Floor Tile	NAD	N/A
	14	Lobby 6		NAD	N/A
08	15	Main Entrance Vestibule 6A	Blue Speckle 12"x12" Floor Tile	NAD	NAD
	16	Lobby 6		NAD	NAD
09	17	Main Entrance Vestibule 6A	Black Mastic Speckle of Green Speckle and Blue Floor Tile	NAD	NAD
	18	Lobby 6		NAD	NAD
10	19	Main Entry Vestibule 6A	Ceiling Glue Dot (Brown)	NAD	NAD
	20	Lobby 6		NAD	NAD
11	21	Main Entry Vestibule 6A	Ceramic Block Mortar (White)	NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
11	22	Lobby 6		NAD	NAD
12	23	Main Entry Vestibule 6A	White Caulking Around Door Frame	NAD	NAD
	24	Main Entry Vestibule 6A		NAD	NAD
13	25	Main Entry Vestibule 6A	Ceiling White Coat Plaster	NAD	N/A
	26	Office 5		NAD	N/A
14	27	Main Entry Vestibule 6A	Ceiling Brown Coat Plaster	NAD	N/A
	28	Office 5		NAD	N/A
15	29	Main Entry Vestibule 6A	Dry Wall (White)	NAD	NAD
	30	Lobby 6		NAD	NAD
16	31	Corridor 42 by Room 56	Brick Mortar (Grey)	NAD	NAD
	32	Corridor 35 by Room 32		NAD	NAD
17	34	Corridor 42 by Room 56	Cinder Block Mortar (Grey)	NAD	N/A
	35	Corridor 36 by room 35		NAD	N/A
18	36	Music Room 48	Grey Fiberboard Wall	NAD	NAD
	37	1st Grade Room 58		NAD	NAD
19	38	Stairs to Attic (By Room 24)	Wall White Coat Plaster	NAD	NAD
	40	2nd Grade Room 35		NAD	NAD
20	41	Stairs to Attic (By Room 24)	Wall Brown Plaster	NAD	N/A
	43	Project Meeting Room 10		NAD	N/A
21	44	Exterior of Front Entrance Awning	Drywall (White)	NAD	N/A
	45	Exterior of Front Entrance Awning		NAD	N/A
22	46	Exterior Front Entrance Furniture	Fiberboard Column (White)	NAD	N/A
	47	Exterior Front Entrance Furniture		NAD	N/A
23	48	Exterior Front Entrance Floor Concrete	Grey Caulking on Concrete	NAD	NAD
	49	Exterior Front Entrance Floor Concrete		NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected
N/A = Not Applicable
NA/PS = Not analyzed/ positive sample

APPENDIX B:
ASBESTOS BULK SAMPLE FIELD DATA SHEETS WITH CHAIN OF CUSODY & LABORATORY RESULTS

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New York, NY 10018
Phone:(212) 563-0400 Fax:(212) 563-0401
www.atlasenvironmentallab.com

Bulk Asbestos Report by PLM-TEM

Client: WSP
Project Name/No.: Bedford Central School District / 31405320.014
Project Address: 7 Pound Ride Rd, Pound Ridge, NY 10576
Collected By: Client
Work Area: First Floor, Exterior

AEL ID# BK0922192
Date Received: 9/14/2022
PLM Date Analyzed: 9/15/2022
TEM Date Analyzed: 9/16/2022
Report Date: 9/17/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
01-02	BK0922192-1	Library, Work Rm - 75B | Drywall (White)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
01-02	BK0922192-2	Library, Opposite End Of Work Rm - 75 | Drywall (White)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
02-03	BK0922192-3	Library, Work Rm - 75B | Joint Compound (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
02-04	BK0922192-4	Library, Opposite End Of Work Rm - 75 | Joint Compound (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
03-05	BK0922192-5	Library, Work Rm - 75B | Ceiling Tile 2'x2' (White)	White, Homogeneous, Non-Fibrous	5.9	84.4	9.8	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
03-06	BK0922192-6	Lobby - 6 | Ceiling Tile 2'x2' (White)	White, Homogeneous, Non-Fibrous	19.4	54.8	25.8	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
04-07	BK0922192-7	Library - 75 - By South Exit | Carpet Mastic (Beige)	Beige, Homogeneous, Non-Fibrous	6.6	16.0	77.4	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
04-08	BK0922192-8	Library - 75 - N.E Side | Carpet Mastic (Beige)	Beige, Homogeneous, Non-Fibrous	8.9	10.5	80.6	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
05-09	BK0922192-9	Library - 75 - By South Exit | Green Cove Base	Grey, Homogeneous, Non-Fibrous	6.9	16.3	76.8	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
05-10	BK0922192-10	Library - 75 - N.E Side | Green Cove Base	Grey, Homogeneous, Non-Fibrous	18.8	11.7	69.5	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**

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Project Name/No.: Bedford Central School District / 31405320.014
Project Address: 7 Pound Ride Rd, Pound Ridge, NY 10576
Collected By: Client
Work Area: First Floor, Exterior

AEL ID# BK0922192
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Report Date: 9/17/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
06-11	BK0922192-11	Library - 75 - By South Exit | Cove Base Mastic (Beige)	Beige, Homogeneous, Non-Fibrous	8.4	29.9	61.7	0%	100%	**NAD** Inconclusive	**NAD**		X	X
06-12	BK0922192-12	Library - 75 - N.E Side | Cove Base Mastic (Beige)	Beige, Homogeneous, Non-Fibrous	15.0	18.1	66.9	0%	100%	**NAD** Inconclusive	**NAD**		X	X
07-13	BK0922192-13	Main Entrance Vestibule - 6A | Green Speckle 12"x12" Floor Tile	Green, Homogeneous, Non-Fibrous	7.1	5.3	87.6	0%	100%	**NAD** Inconclusive	**NAD**		X	X
07-14	BK0922192-14	Lobby - 6 | Green Speckle 12"x12" Floor Tile	Green, Homogeneous, Non-Fibrous	14.7	5.1	80.2	0%	100%	**NAD** Inconclusive	**NAD**		X	X
08-15	BK0922192-15	Main Entrance Vestibule - 6A | Blue Speckle 12"x12" Floor Tile	Blue, Homogeneous, Non-Fibrous	9.6	6.2	84.2	0%	100%	**NAD** Inconclusive	**NAD**		X	X
08-16	BK0922192-16	Lobby - 6 | Blue Speckle 12"x12" Floor Tile	Blue, Homogeneous, Non-Fibrous	7.3	10.5	82.1	0%	100%	**NAD** Inconclusive	**NAD**		X	X
09-17	BK0922192-17	Main Entrance Vestibule - 6A | Black Mastic Of Green Speckle & Blue Speckle Floor Tiles	Black, Homogeneous, Non-Fibrous	13.7	13.5	72.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X
09-18	BK0922192-18	Lobby - 6 | Black Mastic Of Green Speckle & Blue Speckle Floor Tiles	Black, Homogeneous, Non-Fibrous	10.0	1.5	88.5	0%	100%	**NAD** Inconclusive	**NAD**		X	X
10-19	BK0922192-19	Main Entrance Vestibule - 6A | Ceiling Glue Dot (Brown)	Brown, Homogeneous, Non-Fibrous	15.1	51.4	33.4	0%	100%	**NAD** Inconclusive	**NAD**		X	X
10-20	BK0922192-20	Lobby- 6 | Ceiling Glue Dot (Brown)	Brown, Homogeneous, Non-Fibrous	4.5	49.8	45.7	0%	100%	**NAD** Inconclusive	**NAD**		X	X

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Client: WSP
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Project Address: 7 Pound Ride Rd, Pound Ridge, NY 10576
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Work Area: First Floor, Exterior

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Date Received: 9/14/2022
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Report Date: 9/17/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
11-21	BK0922192-21	Main Entrance Vestibule - 6A | Ceramic Black Mortar (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
11-22	BK0922192-22	Lobby - 6 | Ceramic Black Mortar (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
12-23	BK0922192-23	Main Entrance Vestibule - 6A | White Caulking Around Door Frame	White, Homogeneous, Non-Fibrous	20.1	7.1	72.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X
12-24	BK0922192-24	Main Entrance Vestibule - 6A | White Caulking Around Door Frame	White, Homogeneous, Non-Fibrous	21.8	4.4	73.8	0%	100%	**NAD** Inconclusive	**NAD**		X	X
13-25	BK0922192-25	Main Entrance Vestibule - 6A | Ceiling White Coat Plaster	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
13-25A	BK0922192-26	Lobby - 6 | Ceiling White Coat Plaster	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
13-26	BK0922192-27	Office - 5 | Ceiling White Coat Plaster	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
14-27	BK0922192-28	Main Entrance Vestibule - 6A | Ceiling Brown Coat Plaster	Brown, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
14-27A	BK0922192-29	Lobby - 6 | Ceiling Brown Coat Plaster	Brown, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		
14-28	BK0922192-30	Office - 5 | Ceiling Brown Coat Plaster	Brown, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		X		

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Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
15-29	BK0922192-31	Main Entrance Vestibule - 6A | Drywall (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
15-30	BK0922192-32	Lobby - 6 | Drywall (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
16-31	BK0922192-33	Corridor -42 - By Room 56 | Black Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
16-32	BK0922192-34	Corridor - 35 - By Room 32 | Black Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
17-34	BK0922192-35	Corridor - 42 - By Room 56 | Cinder Block Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
17-35	BK0922192-36	Corridor 36 - By Room 35 | Cinder Block Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
18-36	BK0922192-37	Music Room - 48 | Grey Fiberboard Walls	Grey, Homogeneous, Non-Fibrous	47.7	35.9	16.4	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
18-37	BK0922192-38	1st Grade Room - 58 | Grey Fireboard Walls	Grey, Homogeneous, Non-Fibrous	28.2	24.8	47.0	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**
19-38	BK0922192-39	Stair to Attic (By Room-24) | Wall White Coat Plaster	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
19-39	BK0922192-40	Project Meeting Rm - 10 | Wall White Coat Plaster	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		

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Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	All %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
19-40	BK0922192-41	2nd Grade Rm - 35 | Wall White Coat Plaster	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
20-41	BK0922192-42	Stair to Attic (By Room-24) | Wall Brown Coat Plaster	Brown, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
20-42	BK0922192-43	Project Meeting Rm - 10 | Wall Brown Coat Plaster	Brown, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
20-43	BK0922192-44	2nd Grade Rm - 35 | Wall Brown Coat Plaster	Brown, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
21-44	BK0922192-45	Exterior Of Front Entrance Awning | Drywall (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
21-45	BK0922192-46	Exterior Of Front Entrance Awning | Drywall (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
22-46	BK0922192-47	Exterior Front Entrance Furniture | Fiberboard Column (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
22-47	BK0922192-48	Exterior Front Entrance Furniture | Fiberboard Column (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	**NAD**		**X**		
23-48	BK0922192-49	Exterior Front Entrance Floor Concrete | Grey Caulking on Concrete	Grey, Homogeneous, Non-Fibrous	15.0	11.1	73.8	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**

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Project Name/No.: Bedford Central School District / 31405320.014
Project Address: 7 Pound Ride Rd, Pound Ridge, NY 10576
Collected By: Client
Work Area: First Floor, Exterior

AEL ID# BK0922192
Date Received: 9/14/2022
PLM Date Analyzed: 9/15/2022
TEM Date Analyzed: 9/16/2022
Report Date: 9/17/2022

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG %	AII %	ASI %	PLM			TEM	Method By ELAP		
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type	PLM 198.1	PLM NOB 198.6	TEM 198.4
23-49	BK0922192-50	Exterior Front Entrance Floor Concrete | Grey Caulking on Concrete	Grey, Homogeneous, Non-Fibrous	15.3	3.0	81.7	0%	100%	**NAD** Inconclusive	**NAD**		**X**	**X**

MG

Quantitative Analysis (Semi/Full):Bulk Asbestos Analysis-PLM by EPA 600/M4-82-020 per 40 CFR or ELAP198.1 (friable) and 198.6 (NOB) samples for New York.

NAD=no asbestos detected, NA/PS=Not Analyzed/Positive Stop, Trace=<1%,FBGL=Fiberglass, CELL=Cellulose,CHRY=Chrysotile,Amo=Amosite,CRO=Crocidolite,ANTH=Anthophylite, TRE=Tremolite, ACT=Actinolite, NA=not applicable.

PLM is not consistently reliable in detecting Asbestos in floor coverings and similar non friable organically bound materials. NAD or Trace results by PLM are inconclusive.

TEM is currently the only method that can be used to determine if this material can be considered or treated as non asbestos containing in NY State.

All samples were prepared and analyzed in accordance with the EPA "TEM Method for Identifying and Quantifying Asbestos in Non-Fibrous Organically Bound Bulk Samples" ELAP 198.4".

ORG%=Ashed Organic%, AII= Acid Insoluble Inorganic%, ASI= Acid Soluble Inorganic%

NYS-ELAP#11999, NVLAP Lab Code: 500092-0, NJ ID: NY034 "ELCP on NJ won't apply to TEM", CT ID:PH-0154

PLM Analyst: FC TEM Analyst: VR Approved by:

BK0922192

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.014
CLIENT: BEDFORD CENTRAL SCHOOL DISTRICT
PROJECT SITE: 7 POUND RIDGE RD, POUND RIDGE, NY 10576
Project Manager: ALEX SMOLYAR

LOCATION(S) SURVEYED: FIRST FLOOR, EXTERIOR
PROPOSED PROJECT: SED SURVEY
DATE(S) OF INSPECTION: 9.13.2022
Inspector(s): WILLIAMS NG-FONG / STEPHEN GRUBER

WSP
TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. ☑ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
01	01	LIBRARY, WORK RM -75B	DRYWALL (WHITE)		
↓	02	LIBRARY, OPPOSITE END OF WORK RM -75	DRYWALL ↓		
02	03	LIBRARY, WORK RM - 75B	JOINT COMPOUND (WHITE)		
↓	04	LIBRARY, OPPOSITE END OF WORK RM -75	↓ ↓		
03	05	LIBRARY, WORK RM -75B	CEILING TILE 2'x2' (WHITE)		
↓	06	LOBBY - 6	↓ ↓		
04	07	LIBRARY -75- BY SOUTH EXIT	CARPET MASTIC (BEIGE)		
↓	08	LIBRARY -75- N.E SIDE	↓ ↓		
05	09	LIBRARY -75- BY SOUTH EXIT	GREEN COVE BASE		
↓	10	LIBRARY -75- N.E SIDE	↓		
06	11	LIBRARY -75- BY SOUTH EXIT	COVE BASE MASTIC (BEIGE)		
↓	12	LIBRARY -75- N.E SIDE	↓ ↓		

CHAIN OF CUSTODY

Relinquished by: (print) WILLIAMS NG-FONG	(Sign)	9/14/22	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM	Relinquished by: (print)	(Sign)	09/16/22	AM/PM
Received by: (print)	(Sign)	9/14/22	15:07 AM/PM	Received by: (print)	(Sign)	/ /	AM/PM	Received by: (print)	(Sign)	/ /	AM/PM

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL
THERE IS NO SAMPLES NO. 33.

BK0922192

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PROJECT NO.: 31405320.014
CLIENT: BEDFORD CENTRAL SCHOOL DISTRICT
PROJECT SITE: 7 POUND RIDGE RD, POUND RIDGE, NY 10576
Project Manager: ALEX SMOLYAR

LOCATION(S) SURVEYED: FIRST FLOOR
PROPOSED PROJECT: SED SURVEY
DATE(S) OF INSPECTION: 9.13.2022
Inspector(s): WILLIAMS NG-FONG / STEPHEN GRUBER

WSP
TELEPHONE NO. : (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐12 HR. ☐24 HR. ☑48 HR. ☑72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
07	13	MAIN ENTRANCE VESTIBULE - 6A	GREEN SPECKLE 12"X12" FLOOR TILE		
↓	14	LOBBY - 6	↓		
08	15	MAIN ENTRANCE VESTIBULE - 6A	BLUE SPECKLE		
↓	16	LOBBY - 6	↓		
09	17	MAIN ENTRANCE VESTIBULE - 6A	BLACK MASTIC OF GREEN SPECKLE & BLUE SPECKLE FLOOR TILES		
↓	18	LOBBY - 6	↓		
10	19	MAIN ENTRANCE VESTIBULE - 6A	CEILING GLUE DOT. (BROWN)		
↓	20	LOBBY - 6	↓		
11	21	MAIN ENTRANCE VESTIBULE - 6A	CERAMIC BLOCK MORTAR (WHITE) ~~(GREY)~~		
↓	22	LOBBY - 6	↓		
12	23	MAIN ENTRANCE VESTIBULE - 6A	WHITE CAULKING AROUND DOOR FRAME		
↓	24	↓	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
W. NG-FONG		9/14/22				/ /				/ /	
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
[illegible]		9/14/22	15:07			/ /				/ /	

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

BK092219 2

PROJECT NO.: 31405320.014
CLIENT: BEDFORD CENTRAL SCHOOL DISTRICT
PROJECT SITE: 7 POUND RIDGE RD, POUND RIDGE, NY 10576
Project Manager: ALEX SMOLYAR

LOCATION(S) SURVEYED: FIRST FLOOR
PROPOSED PROJECT: SED SURVEY
DATE(S) OF INSPECTION: 9.13.2022
Inspector(s): WILLIAMS NG-FENG / STEPHEN GRUBER

WSP
TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐12 HR. ☐24 HR. ☑WN 48 HR. ☑72 HR.

	HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
25	13	25	MAIN ENTRANCE VESTIBULE - 6A	CEILING WHITE COAT PLASTER		
26		25A	LOBBY - 6			
27	↓	26	~~LOBBY~~ - 6WN OFFICE - 5	↓		
28	14	27	MAIN ENTRANCE VESTIBULE - 6A	CEILING BROWN COAT PLASTER		
29		27A	LOBBY - 6			
30	↓	28	OFFICE - 5	↓		
31	15	29	MAIN ENTRANCE VESTIBULE - 6A	DRY WALL (WHITE)		
32	↓	30	LOBBY - 6	↓		
33	16	31	CORRIDOR - 42 - BY ROOM 56	BRICK MORTAR (GREY)		
34	↓	32	CORRIDOR - 35 - BY ROOM 32	↓		
35	17	34	CORRIDOR - 42 - BY ROOM 56	CINDER BLOCK MORTAR (GREY)		
36	↓	35	CORRIDOR - 36 - BY ROOM 35	↓		
37	18	36	MUSIC ROOM - 48	GREY FIBERBOARD WALLS		
38	↓	37	1ST GRADE ROOM - 58	↓		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
W. NG-FENG		9/14/22				/ /				/ /	
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
		9/14/22	1500			/ /				/ /	

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

BK09 22192

PROJECT NO.: 31405320.014
CLIENT: BEDFORD CENTRAL SCHOOL DISTRICT
PROJECT SITE: 7 POUND RIDGE RD, POUND RIDGE, NY 10576
Project Manager: ALEX SMOLYAR

LOCATION(S) SURVEYED: FIRST FLOOR
PROPOSED PROJECT: SED SURVEY
DATE(S) OF INSPECTION: 9.13.2022
Inspector(s): WILLIAMS NG-FENG / STEPHEN GRUBER

WSP
TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341
ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐12 HR. ☐24 HR. ☑48 HR. ☑72 HR.

	HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
39	19	38	STAIR TO ATTICE (BY ROOM-24)	WALL WHITE COAT PLASTER		
40	↓	39	PROJECT MEETING RM - 10	↓		
41	↓	40	2ND GRADE RM - 35			
42	20	41	STAIR TO ATTICE (BY ROOM-24)	WALL BROWN COAT PLASTER		
43	↓	42	2ND GRADE RM - 35	↓		
44	↓	43	PROJECT MEETING RM - 10			
45	21	44	EXTERIOR OF FRONT ENTRANCE AWNING	DRYWALL (WHITE)		
46	↓	45	↓	↓		
47	22	46	EXTERIOR FRONT ENTRANCE FURNITURE	FIBER-BOARD COLUMN (WHITE)		
48	↓	47	↓	↓		
49	23	48	EXTERIOR FRONT ENTRANCE FLOOR CONCRETE	GREY CAULKING ON CONCRETE		
50	↓	49	↓	↓		

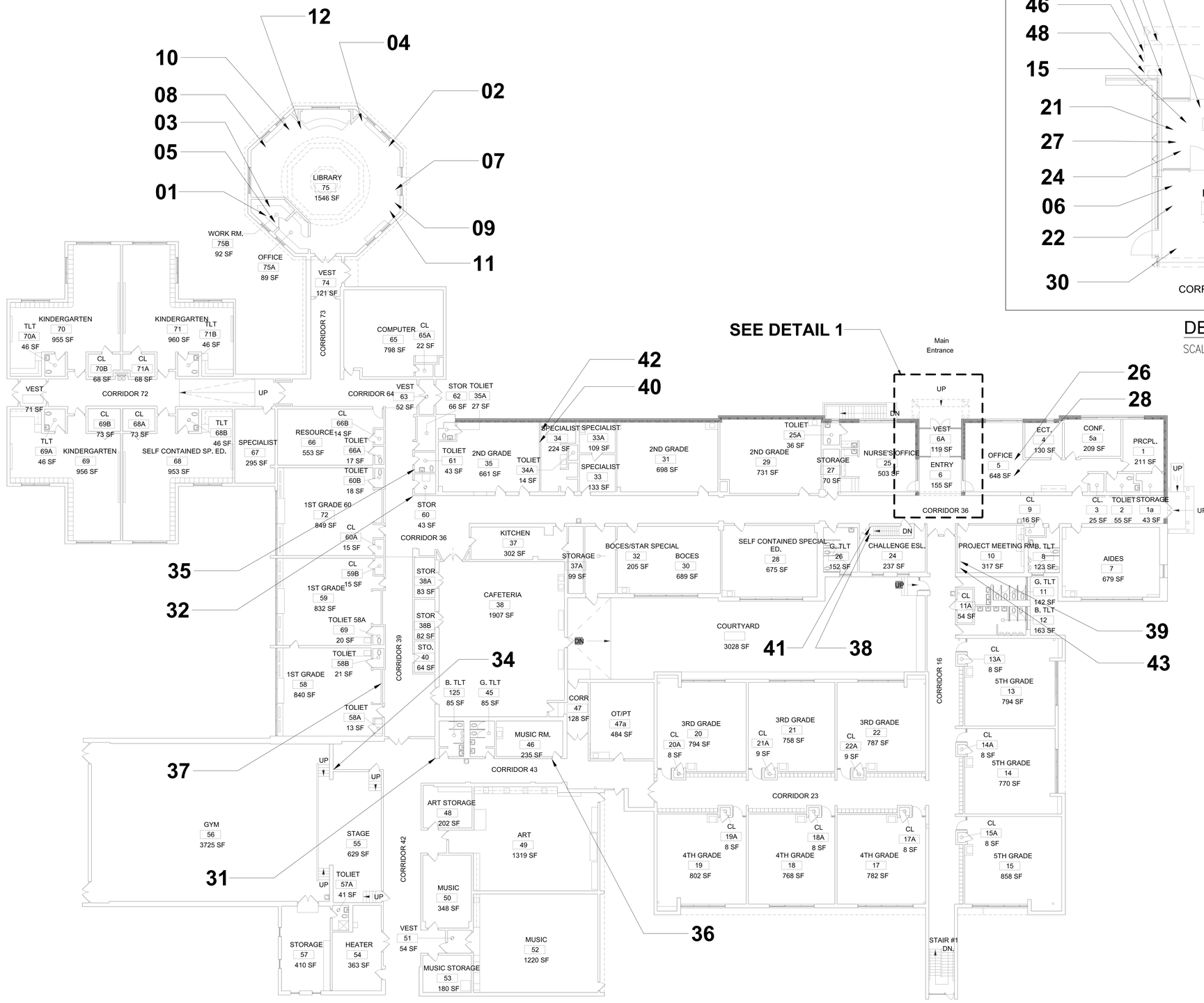
~~W. Ng-Feng~~ WW

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
W. Ng-Feng		9/14/22				/ /				/ /	
Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM	Received by: (print)	(Sign)		AM/PM
Anita Lu		9/14/22 15:07				/ /				/ /	

NOTE: USE STOP AT FIRST POSITIVE METHODOLOGY FOR EVERY HOMOGENEOUS MATERIAL

APPENDIX C:
ASBESTOS BULK SAMPLE LOCATION DRAWINGS



FIRST FLOOR PLAN

SCALE: NOT TO SCALE

DETAIL 1

SCALE: NOT TO SCALE

BEDFORD CENTRAL SCHOOL DISTRICT

Every Single Student, Every Single Day

BEDFORD CENTRAL SCHOOL DISTRICT

FOX LANE CAMPUS
MOUNT KISCO, NY 10528

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL. 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

Pound Ridge Elementary School PRES 1927

POUND RIDGE ELEMENTARY SCHOOL
SED SURVEY PROJECT
7 POUND RIDGE ROAD
POUND RIDGE, NY 10576

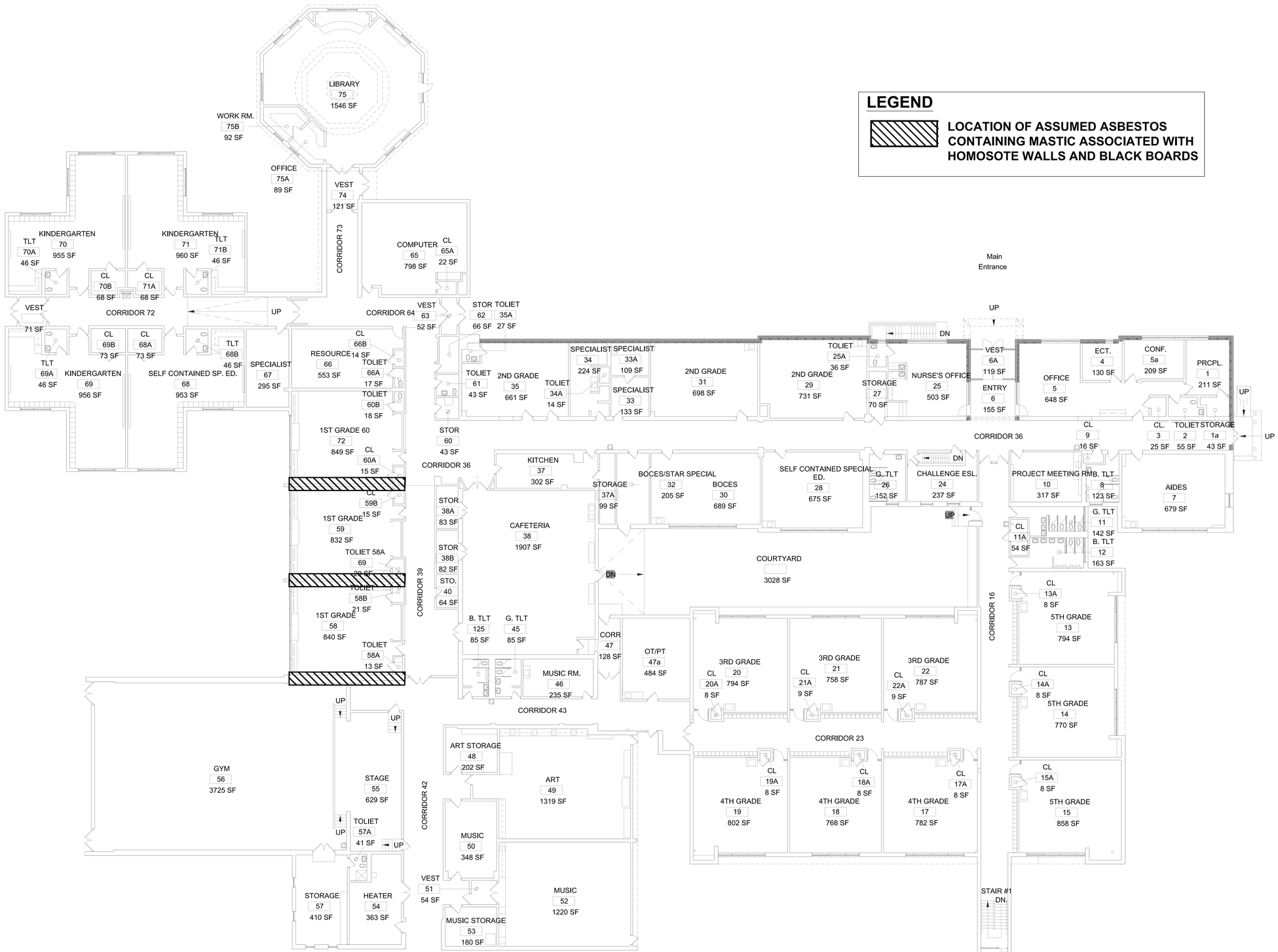
DRAWING TITLE

BULK SAMPLE LOCATIONS FIRST FLOOR PLAN

DRAWN BY: J. PEREZ	SCALE: AS SHOWN
INSP./INV. W. NG-FENG	DATE: 09/26/2022
CERTIFICATE NO. 14-09012	DRAWING NUMBER:
CHECKED BY: A. SMOLYAR	**BSL001**
	DRAWING NUMBER: 1 OF 1

CONSULTANTS PROJECT 31405320.014

APPENDIX D:
ASBESTOS CONTAINING MATERIALS LOCATION DRAWINGS



LEGEND

LOCATION OF ASSUMED ASBESTOS CONTAINING MASTIC ASSOCIATED WITH HOMOSOTE WALLS AND BLACK BOARDS

FIRST FLOOR PLAN

SCALE: NOT TO SCALE

BEDFORD CENTRAL SCHOOL DISTRICT

Every Single Student, Every Single Day

BEDFORD CENTRAL SCHOOL DISTRICT

FOX LANE CAMPUS
MOUNT KISCO, NY 10528

ENVIRONMENTAL CONSULTANT

WSP USA SOLUTIONS, INC.
500 Summit Lake Drive, Suite 450
Valhalla, NY 10595
TEL. 914.742.1120

KEY PLAN:

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

POUND RIDGE ELEMENTARY SCHOOL
SED SURVEY PROJECT
7 POUND RIDGE ROAD
POUND RIDGE, NY 10576

DRAWING TITLE

ASBESTOS CONTAINING MATERIALS FIRST FLOOR PLAN

DRAWN BY: J. PEREZ	SCALE: AS SHOWN
INSP./INV. W. NG-FENG	DATE: 09/26/2022
CERTIFICATE NO. 14-09012	DRAWING NUMBER:
CHECKED BY: A. SMOLYAR	**ACM001**
	DRAWING NUMBER: 1 OF 1

CONSULTANTS PROJECT 31405320.014

APPENDIX E:
LEAD XRF SHOT RESULTS

XRF CALIBRATION CHECK FORM

PROJ. NO.:	31405320.014	DATE:	9-13-2022
PROJECT NAME:	Phase 1	INSPECTOR NAME:	Stephen Gruber
CLIENT:	Bedford CSD	INSPECTOR SIGNATURE:	
SITE:	Pound Ridge Elementary School	PROJ. MANAGER:	A. Smolyar

LOUIS BERGER a WSP USA Company
TELEPHONE # : (212) 612-7900
FAX #: (212) 425-1618
ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014

XRF MAKE/MODEL: ~~RMD LPA-1 (Serial#3675)~~ Heuresis Pb200i (Serial#2150)

LLW#: —

JOB#: —

NOTES:

CALIBRATION CHECK – PRIOR TO LEAVING OFFICE

_____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: _____	TEST #				
	XRF READING				

CALIBRATION CHECK – ~~PRIOR TO LEAVING OFFICE~~ FIELD START

_____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 1700	TEST #	1	2	3	
	XRF READING	0.9	0.9	1.0	

CALIBRATION CHECK – FIELD-START

_____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 1701	TEST #	4	5	6	
	XRF READING	-0.1	0.0	0.1	

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

_____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 1900	TEST #	46	47	48	
	XRF READING	0.0	0.7	0.0	

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

_____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: 1901	TEST #	49	50	51	
	XRF READING	0.1	0.1	-0.1	

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

_____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: _____	TEST #				
	XRF READING				

CALIBRATION CHECK – FIELD-END/2-HR (circle one)

_____ mg/cm² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE
CALIBRATION TIME: _____	TEST #				
	XRF READING				

XRF LEAD-BASED PAINT TESTING DATA SHEET/CHAIN OF CUSTODY

PROJECT NO.: 31405320.014
CLIENT: Bedford Central School District
INSPECTOR(S): Stephen Graber
PROJ. MANAGER: A. Sinclair
PROJECT NAME: Phase 1
PROJECT LOCATION: Pound Ridge Elementary School
INSPECTION DATE: 9.13.2022

SPACE CHARACTERISTICS:
FLOOR #: ____ ROOM #: ____ ROOM NAME: ____

NOTES:

SAMPLE #	SUBSTRATE	COMPONENT DISCRIPTION: COLOR	CONDITION [I / F / P]	COMPONENT	WALL/SIDE DESIGN.	SIDE [L/C/R]	HEIGHT [L/M/U]	COMPONENT REPLICANT	QUANTITY (IF POSITIVE) [SF]	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	XRF READING [mg/cm²]
7	M PL S C CB PG CR B W V CT G FG OTHER:	White		Walls	A B C D RM CTR FL CL		1st	Floor, Library				0.1
8	M PL S C CB PG CR B W V CT G FG OTHER:	↓		Window Frame	A B C D RM CTR FL CL		↓	,		↓		-0.1
9	M PL S C CB PG CR B W V CT G FG OTHER:	Creme		Wall	A B C D RM CTR FL CL			, Corridor	64			0.1
10	M PL S C CB PG CR B W V CT G FG OTHER:	Purple		Wall #1	A B C D RM CTR FL CL			, Computer	65			0.1
11	M PL S C CB PG CR B W V CT G FG OTHER:	Creme		Door Frame	A B C D RM CTR FL CL			,	1	↓		-0.1
12	M PL S C CB PG CR B W V CT G FG OTHER:	White		Wall #2	A B C D RM CTR FL CL					↓		0.2
13	M PL S C CB PG CR B W V CT G FG OTHER:	White		Soffit	A B C D RM CTR FL CL			, Kindergarten	70			0.3
14	M PL S C CB PG CR B W V CT G FG OTHER:	White		Wall	A B C D RM CTR FL CL			, 1st Grade	, 72			0.2
15	M PL S C CB PG CR B W V CT G FG OTHER:	Yellow		~~Yellow~~	A B C D RM CTR FL CL			↓				0.2
16	M PL S C CB PG CR B W V CT G FG OTHER:	Off White		Wall	A B C D RM CTR FL CL			↓				0.3
17	M PL S C CB PG CR B W V CT G FG OTHER:	Creme		Wall	A B C D RM CTR FL CL			Corridor	39			0.2
18	M PL S C CB PG CR B W V CT G FG OTHER:	↓		Wall	A B C D RM CTR FL CL					↓		0.5
19	M PL S C CB PG CR B W V CT G FG OTHER:	Light Blue		Wall	A B C D RM CTR FL CL			Music	52			0.5
20	M PL S C CB PG CR B W V CT G FG OTHER:	↓		↓	A B C D RM CTR FL CL			↓	↓			0.3
21	M PL S C CB PG CR B W V CT G FG OTHER:	White		↓	A B C D RM CTR FL CL			Music Storage	53			0.5
22	M PL S C CB PG CR B W V CT G FG OTHER:	Light Blue		Wall	A B C D RM CTR FL CL			Store	60			0.1
23	M PL S C CB PG CR B W V CT G FG OTHER:	Off White		Wall	A B C D RM CTR FL CL			Boces	30		(*)	1.2
24	M PL S C CB PG CR B W V CT G FG OTHER:	Creme		Wall	A B C D RM CTR FL CL			Specialist	33			0.1
25	M PL S C CB PG CR B W V CT G FG OTHER:	White		Wall	A B C D RM CTR FL CL			Specialist	33A			0.2
26	M PL S C CB PG CR B W V CT G FG OTHER:	Gray		↓	A B C D RM CTR FL CL		↓	↓	↓		↓	0.0

Right; Height: Lower/Middle/Upper; Substrate: M: Metal; PL: Plaster; S: Sheetrock; C: Concrete; CB: Cinder Block; CR: Sinks, Water Closets, etc.; CT: Ceramic Tile; PG: Block; B: Brick; W: Wood; V: Vinyl; FG: Fiberglass; G: Glass ; Condition: I = Intact; F = Fair; P = Poor; Initial Result: P = Positive; N = Negative;

XRF LEAD-BASED PAINT TESTING DATA SHEET/CHAIN OF CUSTODY

PROJECT NO.: 31405320.014
CLIENT: Bedford CSD
INSPECTOR(S): Stephen Gruber
PROJ. MANAGER: A. Snolyar

PROJECT NAME: Phase 1
PROJECT LOCATION: Pound Ridge Elementary School
INSPECTION DATE: 9-13-2022

SPACE CHARACTERISTICS:
FLOOR #: _____ ROOM #: _____ ROOM NAME: _____

NOTES:

SAMPLE #	SUBSTRATE	COMPONENT DISCRIPTION: COLOR	CONDITION (I/F/P)	COMPONENT	WALL/SIDE DESIGN.	SIDE (L/C/R)	HEIGHT (L/M/U)	COMPONENT REPLICANT	QUANTITY (IF POSITIVE) (SF)	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	XRF READING (mg/cm²)
27	M PL (S) C CB PG CR B W V CT G FG OTHER:	Creme		Wall	A B C D RM CTR FL CL		1st	Floor,	Vestibule 6A			0.2
28	M PL (S) C CB PG CR B W V CT G FG OTHER:	White		Ceiling	A B C D RM CTR FL CL		↓		↓			0.1
29	M (PL) S C CB PG CR B W V CT G FG OTHER:	Off White		2nd Ceiling	A B C D RM CTR FL CL		↓		↓			0.4
30	M PL S (C) CB PG CR B W V CT G FG OTHER:	Creme		Wall	A B C D RM CTR FL CL			,	Corridor 36			0.1
31	M PL S C CB PG CR B (W) V CT G FG OTHER:	White		Window Frame	A B C D RM CTR FL CL		Office	5	~~Corridor, 36~~			-0.1
	M PL S C CB PG CR B (W) V CT G FG OTHER:	Creme		Wall	A B C D RM CTR FL CL				~~Office 5~~ 36			-
32	M PL (S) C CB PG CR B W V CT G FG OTHER:	↓		↓	A B C D RM CTR FL CL			Office	5			0.2
33	(M) PL S C CB PG CR B W V CT G FG OTHER:	White		Door Frame	A B C D RM CTR FL CL				↓			0.2
34	M (PL) S C CB PG CR B (W) V CT G FG OTHER:	Blue		Wall	A B C D RM CTR FL CL			Project Meeting	Room 18		(*)	1.6
35	M PL S C CB PG CR B (W) V CT G FG OTHER:	↓		Notice Board	A B C D RM CTR FL CL		↓		↓			0.3
36	M (PL) S C CB PG CR B W V CT G FG OTHER:	White		Column	A B C D RM CTR FL CL		1st	Floor,	Exterior Main Entry			-0.1
37	(M) PL S C CB PG CR B W V CT G FG OTHER:	White		Door Frame	A B C D RM CTR FL CL		↓					-0.2
38	M (PL) S C CB PG CR B W V CT G FG OTHER:	White		Wall	A B C D RM CTR FL CL			,	Aides 7			0.3
39	M PL S C (CB) PG CR B W V CT G FG OTHER:	Creme		Wall	A B C D RM CTR FL CL				5th Grade 13			0.1
40	M PL S C CB PG CR B (W) V CT G FG OTHER:	Blue		Partition-wall	A B C D RM CTR FL CL				↓		14	0.2
41	M PL S C CB PG CR B (W) V CT G FG OTHER:	White		Wall	A B C D RM CTR FL CL				OPT	PT 47a		0.1
42	M PL S C CB PG CR B (W) V CT G FG OTHER:	Creme		Wall	A B C D RM CTR FL CL				Corridor 42			0.0
43	M PL S C (CB) PG CR B W V CT G FG OTHER:	Light Green		Wall	A B C D RM CTR FL CL		Basement	,	Faculty Lounge 76			-0.1
44	M PL (S) C CB PG CR B W V CT G FG OTHER:	↓		↓	A B C D RM CTR FL CL		↓		↓			0.1
45	M PL (S) C CB PG CR B W V CT G FG OTHER:	Orange		Wall	A B C D RM CTR FL CL		1st	Floor,	Cafeteria 38			0.2

Side: Left/Center/Right; Height: Lower/Middle/Upper; Substrate: M: Metal; PL: Plaster; S: Sheetrock; C: Concrete; CB: Cinder Block; CR: Sinks, Water Closets, etc.; CT: Ceramic Tile; PG: Porcelain-glazed Block; B: Brick; W: Wood; V: Vinyl; FG: Fiberglass; G: Glass ; Condition: I = Intact; F = Fair; P = Poor; Initial Result: P = Positive; N = Negative;

APPENDIX F:
PCB BULK SAMPLE FIELD DATA SHEETS WITH CHAIN OF CUSTODY & LABORATORY RESULTS

Technical Report

prepared for:

WSP USA (New York, NY)
One Penn Plaza, 2nd Floor
New York NY, 10119
Attention: Alexander Smolyar

Report Date: 09/22/2022
Client Project ID: 31405320.014
York Project (SDG) No.: 22I0832

Report Date: 09/22/2022
Client Project ID: 31405320.014
York Project (SDG) No.: 22I0832

WSP USA (New York, NY)
One Penn Plaza, 2nd Floor
New York NY, 10119
Attention: Alexander Smolyar

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on September 15, 2022 and listed below. The project was identified as your project: **31405320.014**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Sample and Analysis Qualifiers section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the Sample and Data Qualifiers Relating to This Work Order section of this report and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
22I0832-01	A-01/02/03	Caulk	09/13/2022	09/15/2022
22I0832-02	B-04/05/06	Caulk	09/13/2022	09/15/2022

General Notes for York Project (SDG) No.: 22I0832

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All analyses conducted met method or Laboratory SOP requirements. See the Sample and Data Qualifiers Section for further information.
6. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
7. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.
8. Analyses conducted at York Analytical Laboratories, Inc. Stratford, CT are indicated by NY Cert. No. 10854; those conducted at York Analytical Laboratories, Inc., Richmond Hill, NY are indicated by NY Cert. No. 12058.

Approved By:  **Date:** 09/22/2022

Cassie L. Mosher
Laboratory Manager

Sample Information

Client Sample ID: A-01/02/03 **York Sample ID:** 22I0832-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22I0832	31405320.014	Caulk	September 13, 2022 3:00 pm	09/15/2022

Polychlorinated Biphenyls (PCB) **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.413	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/22/2022 14:24	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.413	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/22/2022 14:24	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.413	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/22/2022 14:24	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.413	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/22/2022 14:24	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.413	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/22/2022 14:24	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.413	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/22/2022 14:24	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.413	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/22/2022 14:24	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.413	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,NJDEP	09/22/2022 14:24	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.413	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,NJDEP	09/22/2022 14:24	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.413	1	EPA 8082A Certifications:	09/20/2022 08:24	09/22/2022 14:24	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*104 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*116 %*	*30-140*

Sample Information

Client Sample ID: B-04/05/06 **York Sample ID:** 22I0832-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22I0832	31405320.014	Caulk	September 13, 2022 3:00 pm	09/15/2022

Polychlorinated Biphenyls (PCB) **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg	0.340	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/22/2022 14:37	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.340	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/22/2022 14:37	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.340	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/22/2022 14:37	BJ

Sample Information

Client Sample ID: B-04/05/06 **York Sample ID:** 22I0832-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22I0832	31405320.014	Caulk	September 13, 2022 3:00 pm	09/15/2022

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550C

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
53469-21-9	Aroclor 1242	ND		mg/kg	0.340	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/22/2022 14:37	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.340	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/22/2022 14:37	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.340	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/22/2022 14:37	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.340	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,CTDOH,NJDEP	09/22/2022 14:37	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.340	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,NJDEP	09/22/2022 14:37	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.340	1	EPA 8082A Certifications:	09/20/2022 08:24 NELAC-NY10854,NJDEP	09/22/2022 14:37	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.340	1	EPA 8082A Certifications:	09/20/2022 08:24	09/22/2022 14:37	BJ

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*101 %*	*30-140*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*106 %*	*30-140*

Analytical Batch Summary

Batch ID: BI20998 **Preparation Method:** EPA 3550C **Prepared By:** KEO

YORK Sample ID	Client Sample ID	Preparation Date
22I0832-01	A-01/02/03	09/20/22
22I0832-02	B-04/05/06	09/20/22
BI20998-BLK1	Blank	09/20/22
BI20998-BS1	LCS	09/20/22
BI20998-BSD1	LCS Dup	09/20/22

Polychlorinated Biphenyls by GC/ECD - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BI20998 - EPA 3550C											
Blank (BI20998-BLK1)								Prepared & Analyzed: 09/20/2022			
Aroclor 1016	ND	0.455	mg/kg								
Aroclor 1221	ND	0.455	"								
Aroclor 1232	ND	0.455	"								
Aroclor 1242	ND	0.455	"								
Aroclor 1248	ND	0.455	"								
Aroclor 1254	ND	0.455	"								
Aroclor 1260	ND	0.455	"								
Aroclor 1262	ND	0.455	"								
Aroclor 1268	ND	0.455	"								
Total PCBs	ND	0.455	"								
Surrogate: Tetrachloro-m-xylene	*1.74*		*"*	*1.82*		*95.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*2.14*		*"*	*1.82*		*118*	*30-140*				
LCS (BI20998-BS1)								Prepared & Analyzed: 09/20/2022			
Aroclor 1016	9.77	0.455	mg/kg	9.09		107	40-130				
Aroclor 1260	10.3	0.455	"	9.09		113	40-130				
Surrogate: Tetrachloro-m-xylene	*1.81*		*"*	*1.82*		*99.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*2.28*		*"*	*1.82*		*126*	*30-140*				
LCS Dup (BI20998-BSD1)								Prepared & Analyzed: 09/20/2022			
Aroclor 1016	8.06	0.455	mg/kg	9.09		88.7	40-130		19.1	25	
Aroclor 1260	8.96	0.455	"	9.09		98.5	40-130		13.9	25	
Surrogate: Tetrachloro-m-xylene	*1.59*		*"*	*1.82*		*87.5*	*30-140*				
Surrogate: Decachlorobiphenyl	*1.94*		*"*	*1.82*		*106*	*30-140*				
Batch Y2I1942 - BI20998											
Aroclor Reference (Y2I1942-ARC1)								Prepared & Analyzed: 09/19/2022			
Surrogate: Tetrachloro-m-xylene	*0.200*		*ug/mL*	*0.200*		*100*					
Surrogate: Decachlorobiphenyl	*0.184*		*"*	*0.200*		*92.0*					

Polychlorinated Biphenyls by GC/ECD - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch Y2I2234 - BI20998											
Aroclor Reference (Y2I2234-ARC1)									Prepared & Analyzed: 09/21/2022		
Surrogate: Tetrachloro-m-xylene	*0.205*		*ug/mL*	*0.200*		*102*					
Surrogate: Decachlorobiphenyl	*0.206*		*"*	*0.200*		*103*					

Sample and Data Qualifiers Relating to This Work Order

Definitions and Other Explanations

*	Analyte is not certified or the state of the samples origination does not offer certification for the Analyte.
ND	NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
LOQ	LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence. This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon NELAC 2009 Standards and applies to all analyses.
LOD	LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.
MDL	METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.
Reported to	This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two. For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the LOD/MDL, with values between the LOD/MDL and the LOQ being "J" flagged as estimated results.

For analyses by EPA SW-846-8270D, the Limit of Quantitation (LOQ) reported for benzidine is based upon the lowest standard used for calibration and is not a verified LOQ due to this compound's propensity for oxidative losses during extraction/concentration procedures and non-reproducible chromatographic performance.

PCB SURVEY DATA SHEET/ CHAIN OF CUSTODY

22I0832

PAGE 1 OF 1

WSP PROJ #: 31405320.014
CLIENT: BEDFORD CENTRAL SCHOOL DISTRICT
Project Site: 7 POUND RIDGE RD, POUND RIDGE, NY 10576
Project Manager: ALEX SMOLYAR

LOCATION(S) SURVEYED FIRST FLOOR, EXTERIOR
PROPOSED PROJECT: SED SURVEY
DATE(S) OF INSPECTION: 9.13.2022
Inspector(s) WILLIAMS NG-FENG / STEPHEN GRUBER

WSP
TELEPHONE N0. : (212) 612-7900 **FAX N0.: (212) 363-4341**
ADDRESS: 96 Morton Street, 8 Floor, New York, NY 10014

RESULTS TO: Lb.labresults@wsp.com
Alexander.smolyar@wsp.com

TURNAROUND TIME:
☐48 HR ☐72 H R ☐96 HR ☒120 HR

LAB SAMPLE NO.	HA	SAMPLE NO.	MATERIAL DESCRIPTION	SAMPLE LOCATION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
	A	01, 02, 03	WHITE CAULKING AROUND DOOR FRAME	FRENT ENTRANCE VESTIBULE - 6A		
	B	04, 05, 06	GREY CAULKING ON CONCRETE FLOOR	MAIN ENTRANCE EXTERIOR FLOOR		

CHAIN OF CUSTODY

Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM	Relinquished by: (print)	(Sign)		AM/PM
STEPHEN GRUBER		9/15/22	1159			9/15/22	1150			/ /	
Received by: (print)	(Sign)	/ /	AM/PM	Received by: (print)	(Sign)	/ /	AM/PM	Received by: (print) KBlocker	(Sign) KBlocker	9/15/22	AM/PM

5,10C

LAB INSTRUCTIONS: create one (1) composite sample of each homogeneous material from equal mass portions (± 5%) of the three (3) sub-samples for extraction and analysis via EPA Method 8082 and report the Arochlors listed (Arochlor 1016, Arochlor 1221, Arochlor 1232, Arochlor 1242, Arochlor 1248, Arochlor 1254, Arochlor 1260). The laboratory shall target a PCB detection limit of 1 ppm

APPENDIX G:
COMPANY LICENSE, PERSONAL CERTIFICATIONS AND LABORATORY ACCREDITATIONS

New York State – Department of Labor
Division of Safety and Health
License and Certificate Unit
State Campus, Building 12
Albany, NY 12240

ASBESTOS HANDLING LICENSE

WSP USA Inc.
4th Floor
One Penn Plaza

New York, NY 10119

FILE NUMBER: 99-1197
LICENSE NUMBER: 28575
LICENSE CLASS: RESTRICTED
DATE OF ISSUE: 04/13/2022
EXPIRATION DATE: 04/30/2023

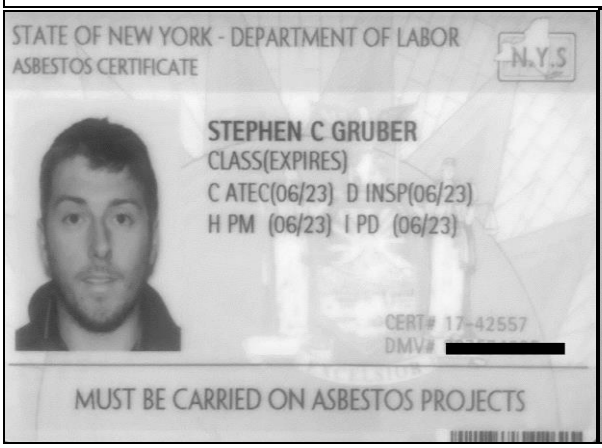
Duly Authorized Representative – Prakash Saha:

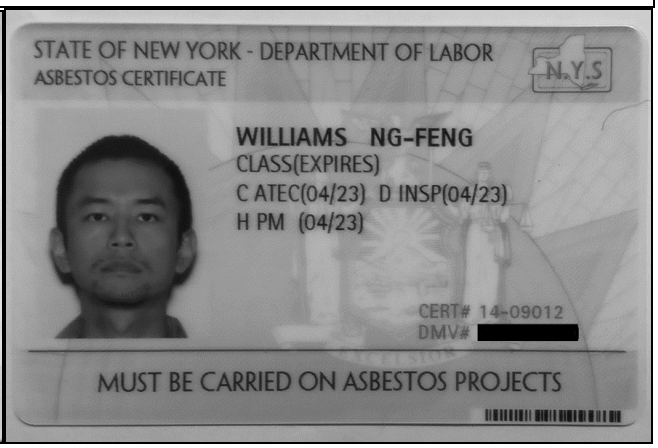
This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Amy Phillips, Director
For the Commissioner of Labor

SH 432 (8/12)





United States Environmental Protection Agency

This is to certify that

WSP USA Inc.

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint renovation, repair, and painting activities pursuant to 40 CFR Part 745.89

In the Jurisdiction of:

All EPA Administered States, Tribes, and Territories

This certification is valid from the date of issuance and expires November 12, 2025

NAT-103950-1
Certification #

October 29, 2020
Issued On

Michelle Price, Chief
Lead, Heavy Metals, and Inorganics Branch

NEW YORK STATE OF OPPORTUNITY. Department of Health

ANDREW M. CUOMO
Governor

HOWARD A. ZUCKER, M.D., J.D.
Commissioner

LISA J. PINO, M.A., J.D.
Executive Deputy Commissioner

MAY 0 6 2021

WSP USA Inc.
96 Morton Street, 8th Floor
New York, New York 10014

Attention: Michael Gelfand
Radiation Safety Officer

RE: NYS Dept. of Health Radioactive Materials License No. C3093
DH No. 21-144

Dear Mr. Gelfand:

In accordance with the application, dated April 19, 2021, signed by you and Steven Eget, please find enclosed amendment No. 9 to New York State Department of Health Radioactive Materials License No. C3093, which changes the ownership of this license from The Louis Berger Group, Inc. to WSP USA Inc.

If I may be of assistance, please contact this office at berp@health.ny.gov or at:

New York State Department of Health
Bureau of Environmental Radiation Protection
Radioactive Materials Section
ESP – Corning Tower, Room 1245
Albany, New York 12237

Sincerely,

DJS/IA

Daniel J. Samson, CHP, Chief
Radioactive Materials Section
Bureau of Environmental Radiation Protection

enclosure: Amendment No. 9

cc: Steven Eget, PE, CEM, Managing Director

NEW YORK STATE DEPARTMENT OF HEALTH

RADIOACTIVE MATERIALS LICENSE

Pursuant to the Public Health Law, Part 16 of the New York State Sanitary Code, and in reliance on statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing radioactive material(s) for the purpose(s), and at the place(s) designated below. The license is subject to all applicable rules, regulations, and orders now or hereafter in effect of all appropriate regulatory agencies and to any conditions specified below.

1. NAME OF LICENSEE	3. LICENSE NUMBER
FEIN 22-1754524 **WSP USA Inc.** Phone (212) 612-7933	C3093 4. EXPIRATION DATE August 6, 2024
2. ADDRESS OF LICENSEE	5a. REFERENCE / b. AMENDMENT NO.
96 Morton Street, 8th Floor New York, New York 10014	**DH 21-144** / **9**

This license is subject to the following conditions:

Conditions 6 through 9 – Authorized Materials, Form, Possession Limits and Uses
Condition 10 – Radiation Safety Officer, Medical Physicists, and Radiation Safety Committee
Condition 11 – Documents Incorporated by Reference
Conditions 12 and beyond – License Conditions

In accordance with the application dated April 19, 2021, signed by Steven Eget and Michael Gelfand, New York State Department of Health Radioactive Materials License No. C3093 is hereby amended.

Only the amended sections are included, with specific changes indicated in bold type. All previous license conditions not specifically addressed in this amendment shall remain valid and enforceable.

NEW YORK STATE DEPARTMENT OF HEALTH

RADIOACTIVE MATERIALS LICENSE

3. License Number C3093 **5a. Reference DH 21-144** **b. Amendment No. 9**

DOCUMENTS INCORPORATED BY REFERENCE

11. Except as specifically provided otherwise in this License, the licensee shall conduct its program in accordance with the statements, representation and procedures contained in the documents, including any enclosures, listed below:

A. Application for New York State Department of Health Radioactive Materials License dated October 26, 2012, signed by Craig Napolitano, Director.

B. Letter dated December 12, 2012, signed by Michael Gelfand.

C. Letter dated December 7, 2017, signed by Michael Gelfand.

D. Letter dated April 19, 2021, signed by Steven Eget and Michael Gelfand.

The New York State Department of Health's regulations shall govern the licensee's statements in applications or letters unless the statements are more restrictive than the regulations.

FOR THE NEW YORK STATE DEPARTMENT OF HEALTH

Date: MAY 0 6 2021

By _____

Daniel J. Samson, CHP, Chief
Radioactive Materials Section
Bureau of Environmental Radiation Protection

DJS/IA

United States Environmental Protection Agency

This is to certify that

Stephen C Gruber

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Inspector

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires December 12, 2023

LBP-I-I219874-1
Certification #

November 28, 2020
Issued On

Ben Conetta, Chief
Chemicals and Multimedia Programs Branch

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2023
Issued April 01, 2022

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MS. JACKIE DARVISH
ATLAS ENVIRONMENTAL LABS CORP
255 W 36TH STREET SUITE 1503
NEW YORK, NY 10018

NY Lab Id No: 11999

is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:

Miscellaneous	
Asbestos in Friable Material	Item 198.1 of Manual
	EPA 600/M4/82/020
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)
Asbestos in Non-Friable Material-TEM	Item 198.4 of Manual
Asbestos-Vermiculite-Containing Material	Item 198.8 of Manual
Lead in Dust Wipes	EPA 7000B
Lead in Paint	EPA 7000B
Sample Preparation Methods	
	EPA 3050B

Serial No.: 64911

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 500092-0

Atlas Environmental Lab (Asbestos in Bulk)

New York, NY

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2021-10-01 through 2022-09-30
Effective Dates

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

For the National Voluntary Laboratory Accreditation Program

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

Atlas Environmental Lab

255 W 36th Street, Suite 1503, New York, NY 10018

Laboratory ID: LAP-208306

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA LAP), LLC accreditation to the ISO/IEC 17025:2017 international standard, General Requirements for the Competence of Testing and Calibration Laboratories in the following:

LABORATORY ACCREDITATION PROGRAMS

☑	**INDUSTRIAL HYGIENE**	Accreditation Expires: August 01, 2023
☑	**ENVIRONMENTAL LEAD**	Accreditation Expires: August 01, 2023
☑	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires: August 01, 2023
☐	**FOOD**	Accreditation Expires:
☐	**UNIQUE SCOPES**	Accreditation Expires:

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached Scope of Accreditation. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2017 and AIHA LAP, LLC requirements. This certificate is not valid without the attached Scope of Accreditation. Please review the AIHA LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

Cheryl O. Morton

Cheryl O Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

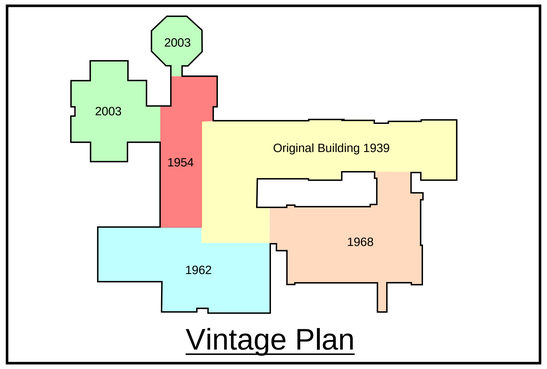
Revision19.1: 07/28/2021

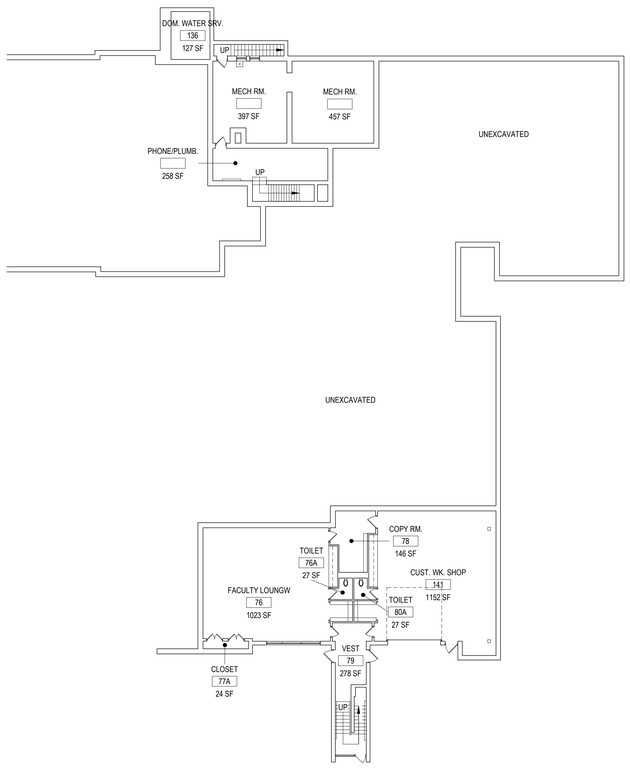
Date Issued: 07/28/2021

APPENDIX H:
SCOPE OF WORK DRAWINGS

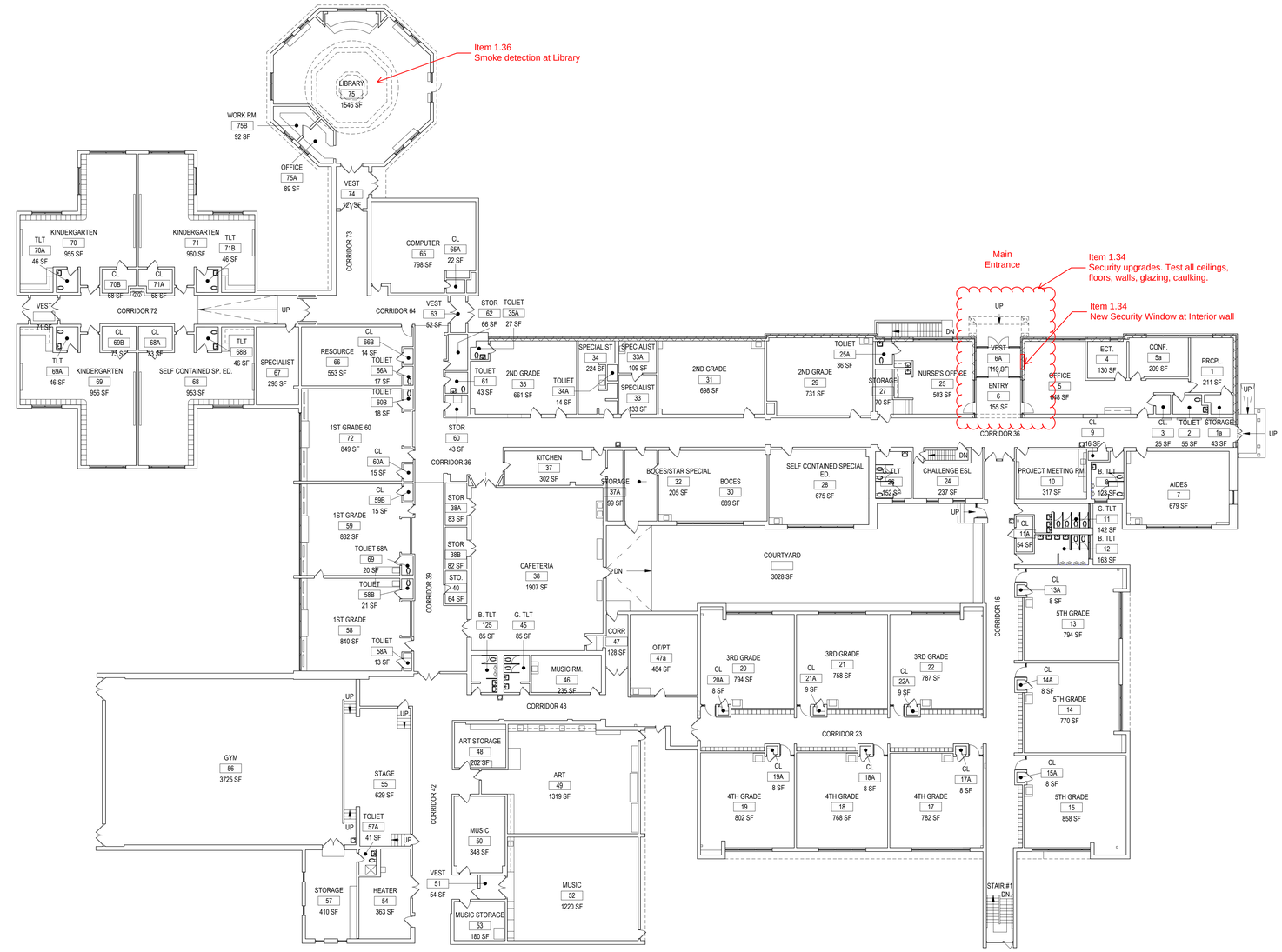
Pound Ridge ES Phase 1 Projects - Scope of Work

1.34	Pound Ridge Elementary School	PRES A-11	Provide new security window and fire shutter. Provide new security film to entry door glazing. Provide sliding tray below window.
1.35	Pound Ridge Elementary School	PRES E-3	Add telephone handsets to classrooms to improve communications and enhance safety during emergency situations
1.36	Pound Ridge Elementary School	PRES E-7	Provide smoke detection at library





1 EXISTING LOWER LEVEL FLOOR PLAN
SCALE: 1/16" = 1'-0"



2 EXISTING FIRST FLOOR PLAN
SCALE: 1/16" = 1'-0"

EXISTING FLOOR PLANS
POUND RIDGE ELEMENTARY SCHOOL
BEDFORD CSD

02/02/21

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS

APPENDIX I:
PHOTOGRAPHIC DOCUMENTATION

- Photo 1: Lead based paint (Off White Paint on Plaster Wall (Room Boces 30 And Interior Rooms Throughout Original Building 1939)

- Photo 2: Lead Based Blue Paint on Plaster Wall (Project Meeting, Room 10 And Interior Rooms Throughout Original Building 1939)

Photo 3: Non ACM Glue Dots on Ceiling

Photo 4: Non-ACM Plaster Wall and Ceiling. Also Showed Non ACM Ceiling Tiles 2'x2'

Photo 5: Non-ACM Gypsum Board and Joint Compound

Photo 6: Non-ACM Brick Mortar and 12x12 Floor Tile

APPENDIX J:
FILE SEARCH

ASBESTOS TRIENNIAL INSPECTION REPORT

for

POUND RIDGE ELEMENTARY SCHOOL

BEDFORD CENTRAL SCHOOL DISTRICT
Fox Lane Campus
Mount Kisco, New York 10528

by

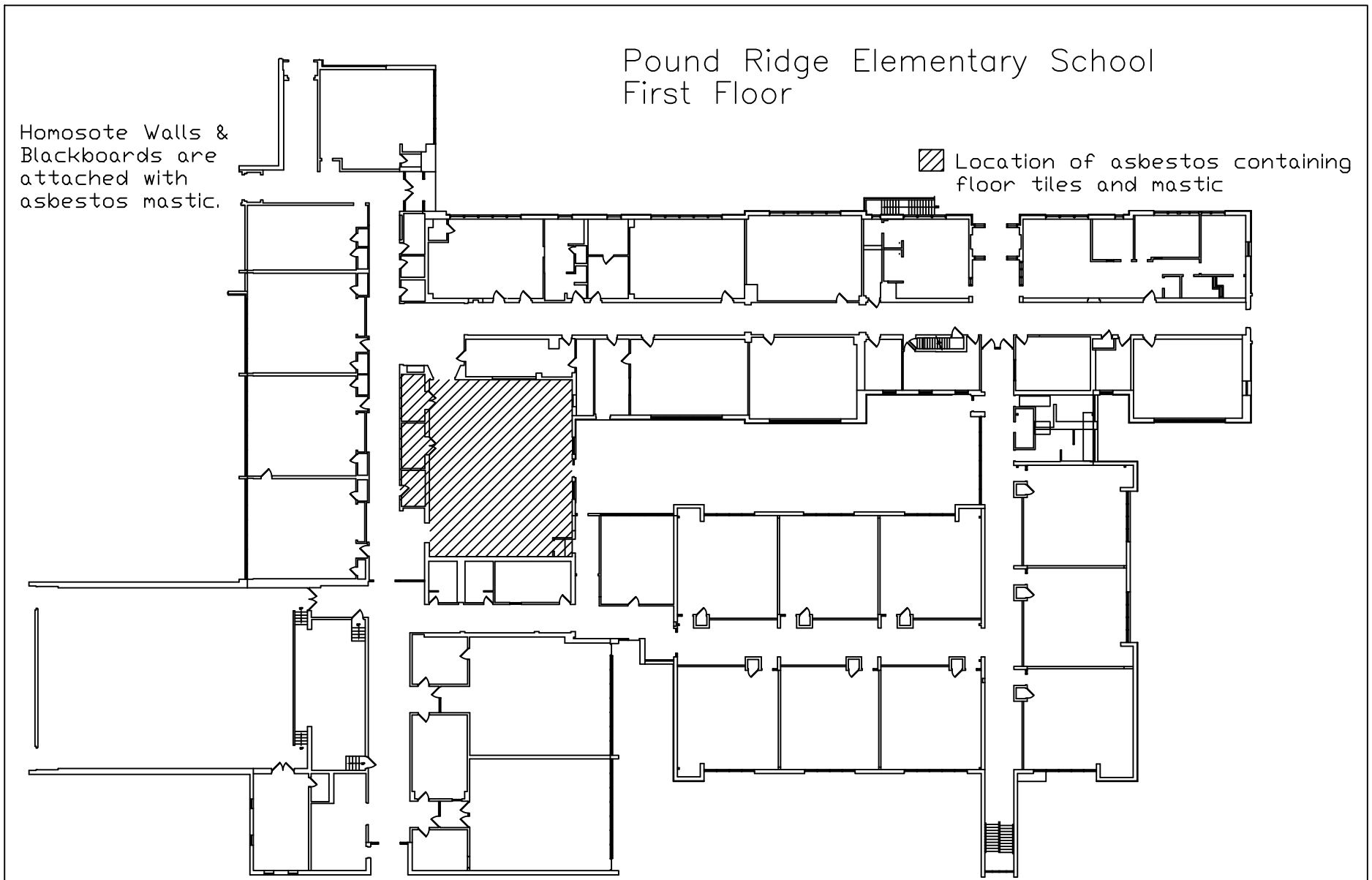
S & B ENVIRONMENTAL, LLC
7 Fairchild Road
Newtown, CT. 06470

12 May 2019

Pound Ridge Elementary School
First Floor

Homosote Walls & Blackboards are attached with asbestos mastic.

Location of asbestos containing floor tiles and mastic



INFORMATION AVAILABLE TO BIDDERS

BBS Architects, Landscape Architects & Engineers, P.C. (BBS), accepts no responsibility for information contained within the items listed below that have been provided by others.

Any questions concerning information contained within these items shall be forwarded via the standard Request for Information process. BBS will forward these Requests for response by the appropriate party.

A. Pre-Construction Inspection and Sampling – Prepared by Prepared by WSP USA Solutions, Inc. 550 Summit Lake Drive, Suite 450 Valhalla, NY 10595 (914)-747-1120. Document follows this section. Document follows this section.
    - Fox Lane High School
    - Fox Lane Middle School
    - Mount Kisco Elementary School
    - Bedford Hills Elementary School
    - West Patent Elementary School
    - Bedford Village Elementary School
    - Pound Ridge Elementary School

The surveys and subsurface investigations were prepared for the Owner of the use in design. These documents are not part of the Construction Contract Documents and are provided by the Owner for informational use only.

END OF SECTION

BID PROPOSAL FORM - BEDFORD CENTRAL SCHOOL DISTRICT – PHASE 1A BOND IMPROVEMENTS

NAME OF BIDDER: _____

BUSINESS ADDRESS: _____

TELEPHONE NUMBER: _____ **DATE OF BID:** _____

The bidder mentioned above declares and certifies:

First: That said bidder is of lawful age and the only one interested in this bid, and that no one other than said bidder has any interest herein.

Second: That this bid is made without any previous understanding, agreement, or connection with any other person, firm, or corporation making a bid for the same purpose, and is in all respects fair and without collusion or fraud.

Third: That no member of the Board of Education of the **Bedford Central School District**, **Town of Bedford**, **New York**, nor any officer or employee or person whose salary is payable as a whole or in part from the treasury of said Board of Education is directly or indirectly interested in this bid or in the supplies, materials, equipment, work, or services to which it relates, or in any portion of the profits thereof.

Fourth: That said bidder has carefully examined the Instruction to Bidders, schedules, and specifications prepared under the direction of the Board of Education, and will, if successful in this bid, furnish and deliver at the prices bid and within the time stated, all materials, supplies, apparatus, goods, wares, merchandise, services, or labor for which this bid is made.

Sixth: That the prices quoted are exclusive of all federal, state, and municipal sales and excise taxes.

Seventh: The undersigned further declares that he has received and examined the following addenda:

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

FOR PROPOSAL FORM TO BE VALID, ALL PAGES OF THE PROPOSAL FORM

MUST BE DULY EXECUTED.

Eighth: The Bidder shall check here _____ if the bid has been based upon equivalents in lieu of any kind, type, brand, or manufacturer of material other than those named in the specifications. If checked, the Bidder shall submit the Equivalency Form in accordance with Instructions to Bidders, Paragraph 8B. This item in no way prohibits the Bidder from submitting equivalents after the award of contract.

Ninth: The undersigned further understands and agrees that he is to furnish all labor, materials, equipment, supplies, and other facilities and things necessary and required for the execution and completion of:

BEDFORD CSD – PHASE 1A BOND IMPROVEMENTS

in strict accordance with the contract documents:

BASE BID GC-1 GENERAL CONSTRUCTION CONTRACT

The General Contractor shall state the complete price to perform all work including, but not limited to, all general construction demolition, related to the construction as shown on the drawings and specified herein.

BASE BID GC-1 BID PRICE = $_____

Lump Sum Allowance No. GC-1 = $_____$20,000_
Unforeseen Conditions (See Section 01 21 00)

TOTAL GENERAL CONSTRUCTION
BASE BID GC-1 BID PRICE = $_____
Total Construction Base Bid GC-1 Price written in dollars and cents

$_____
Total Construction Base Bid GC-1 Price written in words

ALTERNATES FOR BASE BID GC-1

1. ALTERNATE NO. 1 TO GC-1

The General Contractor shall state the complete price to be **(added to)** the base bid to provide general construction for High School door and frame replacements at doors 'A2', 'B1", & 'F5' as shown on the contract documents.

Add: $_____
Bid Price written in dollars and cents

$_____
Bid Price written in words

2. ALTERNATE NO. 2 TO GC-1

The General Contractor shall state the complete price to be **(added to)** the base bid to provide demolition and new doors/frames for Middle School doors 'G1-A' & 'G1-B' as shown on the contract documents.

Add: $_____
Bid Price written in dollars and cents

$_____
Bid Price written in words

3. ALTERNATE NO. 3 TO GC-1

The General Contractor shall state the complete price to be **(added to)** the base bid to provide new walls and windows as shown at Middle School Shelter Room as shown on the contract documents.

Add: $_____
Bid Price written in dollars and cents

$_____
Bid Price written in words

4. ALTERNATE NO. 4 TO GC-1

The General Contractor shall state the complete price to be **(added to)** the base bid to provide front entry door replacement at Bedford Hills Elementary School as shown on the contract documents.

Add: $_____
Bid Price written in dollars and cents

$_____
Bid Price written in words

BASE BID MC-2 MECHANICAL CONSTRUCTION CONTRACT

The Mechanical Contractor shall state the complete price to perform all work including, but not limited to, all Mechanical construction demolition, related to the construction as shown on the drawings and specified herein.

BASE BID MC-2 BID PRICE = $_____

Lump Sum Allowance No. MC-1 = $_____$5,000_
Unforeseen Conditions (See Section 01 21 00)

TOTAL MECHANICAL CONSTRUCTION
BASE BID MC-1 BID PRICE = $_____
Total Construction Base Bid MC-2 Price written in dollars and cents

$_____
Total Construction Base Bid MC-2 Price written in words

ALTERNATES FOR BASE BID MC-2

1. ALTERNATE NO. 1 TO MC-2

The Mechanical Contractor shall state the complete price to be **(added to)** the base bid to provide mechanical construction for Mount Kisco Elementary School Room 64A split system as shown on the contract documents.

Add: $_____
Bid Price written in dollars and cents

$_____
Bid Price written in words

BASE BID EC-3 ELECTRICAL CONSTRUCTION CONTRACT

The Electrical Contractor shall state the complete price to perform all work including, but not limited to, all electrical construction demolition, related to the construction as shown on the drawings and specified herein.

BASE BID EC-3 BID PRICE = $_____

Lump Sum Allowance No. EC-1 = $_____$20,000_
Unforeseen Conditions (See Section 01 21 00)

TOTAL ELECTRICAL CONSTRUCTION
BASE BID EC-3 BID PRICE = $_____
Total Construction Base Bid EC-3 Price written in dollars and cents

$_____
Total Construction Base Bid EC-3 Price written in words

ALTERNATES FOR BASE BID EC-3

1. ALTERNATE NO. 1 TO EC-3

The Electrical Contractor shall state the complete price to be **(added to)** the base bid to provide electrical construction for Mount Kisco Elementary School Room 64A split system as shown on the contract documents.

Add: $_____
Bid Price written in dollars and cents

$_____
Bid Price written in words

The Board of Education hereby reserves the right to accept or reject any item set forth individually in Paragraph Nine above. The Owner may determine the lowest bid by adding one base bid to other base bid(s) and/or by adding to or deducting from those base bid(s), additive or deduct alternates, unit prices, or substitutions, if any, which the Owner elects to accept after the opening of bids.

UNIT PRICES

Refer to section 01 22 00 Unit Prices.

Unit Prices for General Contractor GC-1

1. Unit Price: Material & labor for preparation of substrate and ½" of floor self-leveling as per section 03650. $_____/sf

2. Unit Price: Material & labor for preparation of substrate and 1.5" of floor self-leveling as per section 03650. $_____/sf

Unit Prices for Mechanical Contractor MC-2

None

Unit Prices for Electrical Contractor EC-3

None

Tenth: **BID SECURITY**

Each bidder shall deposit with his bid a bid bond, bank draft, or certified check in the amount of not less than five percent (5%) of the Base Bid made payable to:

Bedford CSD Board of Education, in the amount:

_____ $(_____)

AND agrees such surety shall be a measure of liquidated damages should he default in delivery of agreement.

Eleventh: **COMPLETION** (Contractor shall fill in number of days)

It is intended that the work under this contract be completed substantially within _____ _____ consecutive calendar days after receipt of authorized letter of intent issued by the District.

Twelfth: **NON-COLLUSIVE BIDDING CERTIFICATION**
General Municipal Law, Section 103-d
(Submit with Bid Proposal Form)

A. By submission of this bid, the bidder and each person signing on behalf of the bidder certifies, and if this is a joint bid each party hereto certifies as to its own organization, under penalty of perjury that to the best of the bidder's knowledge and belief:

1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;

2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and

3. No attempt has been made or will be made by the bidder to induce any other person, partnership, or corporation to submit a bid for the purpose of restricting competition.

B. A bid shall not be considered for award nor shall award be made where A-1, 2, and 3 above have not been complied with provided, however, that if in any case the bidder shall so state and shall furnish with a bid a signed statement which sets forth in detail the reasons therefore, where A-1, 2, and 3 above have not been complied with, the bid shall not be considered for award nor shall any award be made unless the head of the purchasing unit of the political subdivision, public department agency, or official thereof to which

the bid is made, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

The fact that the bidder: (a) has published price lists, rates, or tariffs covering items being procured, (b) has informed prospective customers of proposed or pending publication of new or revised price lists for such items, or (c) has sold the same items to other customers at the same prices being bid, does not constitute without more, a disclosure within the meaning of Paragraph A above.

C. If the bidder is a corporation, the corporation shall be deemed to have been authorized by the Board of Directors of the bidder to make the above certification and such authorization shall be deemed to include the signing and submission of the bid and the inclusion therein of the certificate as to non-collusion as the act and deed of the corporation.

(Seal of Corporation) _____
Corporate or Company Name

By: _____
Signature Title

Date: _____

Thirteenth: On acceptance of this proposal for said work, the undersigned hereby binds himself or themselves to enter into written contract with the Board of Education within ten (10) days of date of notice of award, and to comply in all respects with the provisions set forth in "Instructions for Bidders" and "General Conditions of Contract" in relation to security for the faithful performance of the terms of said contract.

IF A CORPORATION (Seal of corporation):

NAME	ADDRESS
_____ President	_____
_____ Secretary	_____
_____ Treasurer	_____

BID PROPOSAL FORM - BEDFORD CENTRAL SCHOOL DISTRICT – PHASE 1A BOND IMPROVEMENTS

IF A FIRM:

NAME OF MEMBERS	ADDRESS
_____	_____
_____	_____

PROPOSED EQUIVALENT FORM

Project: **PHASE 1A BOND IMPROVEMENTS at BEDFORD CENTRAL SCHOOL DISTRICT**

Name of Bidder (Corporate Name): _____

Date: _____ Prime Contract For_____

In accordance with Instructions to Bidders, Article 8, the above listed Bidder proposes the following materials, equipment, or methods for consideration by the Architect as equivalents to those specified or shown in the Contract Documents, and for incorporation into the Work at no additional cost to the Owner. The Contractor is aware of the risk of acceptance.

Project Manual Section Number and Specified Product	Proposed Equivalent
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

PROPOSED SUBSTITUTION FORM

The Base Bid Contract Sum proposed by the undersigned on the preceding Bid Proposal Form is based upon all items exactly as shown and described in the Contract Documents. For the Owner's consideration, the Bidder proposes the following substitute materials, equipment, or methods to be used in the work, in lieu of those specified, with a credit for cost savings to the Owner if accepted. Refer to Article 8(c) of the Instructions to Bidders.

	Specified Product and Section Number	Proposed Substitute	Credit Amount
1.	_____	_____	
	_____	_____	$_____
2.	_____	_____	
	_____	_____	$_____
3.	_____	_____	
	_____	_____	$_____

Name of Bidder (Corporate Name): _____

Date: _____ By:_____
Signature of Corporate Officer

CERTIFICATION OF COMPLIANCE WITH THE IRAN DIVESTMENT ACT

As a result of the Iran Divestment Act of 2012 (the "Act"), Chapter 1 of the 2012 Laws of New York, a new provision has been added to State Finance Law (SFL) § 165-a and New York General Municipal Law § 103-g, both effective April 12, 2012. Under the Act, the Commissioner of the Office of General Services (OGS) will be developing a list of "persons" who are engaged in "investment activities in Iran" (both are defined terms in the law) (the "Prohibited Entities List"). Pursuant to SFL § 165-a(3)(b), the initial list is expected to be issued no later than 120 days after the Act's effective date at which time it will be posted on the OGS website.

By submitting a bid in response to this solicitation or by assuming the responsibility of a Contract awarded hereunder, each Bidder/Contractor, any person signing on behalf of any Bidder/Contractor and any assignee or subcontractor and, in the case of a joint bid, each party thereto, certifies, under penalty of perjury, that once the Prohibited Entities List is posted on the OGS website, that to the best of its knowledge and belief, that each Bidder/Contractor and any subcontractor or assignee is not identified on the Prohibited Entities List created pursuant to SFL § 165-a(3)(b).

Additionally, Bidder/Contractor is advised that once the Prohibited Entities List is posted on the OGS Website, any Bidder/Contractor seeking to renew or extend a Contract or assume the responsibility of a Contract awarded in response to this solicitation must certify at the time the Contract is renewed, extended or assigned that it is not included on the Prohibited Entities List.

During the term of the Contract, should the School District receive information that a Bidder/Contractor is in violation of the above-referenced certification, the School District will offer the person or entity an opportunity to respond. If the person or entity fails to demonstrate that he/she/it has ceased engagement in the investment which is in violation of the Act within 90 days after the determination of such violation, then the School District shall take such action as may be appropriate including, but not limited to, imposing sanctions, seeking compliance, recovering damages or declaring the Bidder/Contractor in default. The School District reserves the right to reject any bid or request for assignment for a Bidder/Contractor that appears on the Prohibited Entities List prior to the award of a contract and to pursue a responsibility review with respect to any Bidder/Contractor that is awarded a contract and subsequently appears on the Prohibited Entities List.

I, _____, being duly sworn, deposes and says that he/she is the

_____ of the _____ Corporation and that neither

the Bidder/ Contractor nor any proposed subcontractor is identified on the Prohibited Entities List.

_____

SIGNED

SWORN to before me this

_____ day of _____

201___

Notary Public: _____

DECLARATION OF BIDDER'S INABILITY TO PROVIDE CERTIFICATION OF COMPLIANCE WITH THE IRAN DIVESTMENT ACT

Bidders shall complete this form if they cannot certify that the bidder /contractor or any proposed subcontractor is not identified on the Prohibited Entities List. The District reserves the right to undertake any investigation into the information provided herein or to request additional information from the bidder.

Name of the Bidder: _____

Address of Bidder: _____

Has bidder been involved in investment activities in Iran? _____
Describe the type of activities including but not limited to the amounts and the nature of the investments (*e.g.* banking, energy, real estate)_____
_____
_____
_____

If so, when did the first investment activity occur? _____

Have the investment activities ended? _____

If so, what was the date of the last investment activity?_____

If not, have the investment activities increased or expanded since April 12, 2012? _____

Has the bidder adopted, publicized, or implemented a formal plan to cease the investment activities in Iran and to refrain from engaging in any new investments in Iran?_____

If so, provide the date of the adoption of the plan by the bidder and proof of the adopted resolution, if any and a copy of the formal plan. _____

In detail, state the reasons why the bidder cannot provide the Certification of Compliance with the Iran Divestment Act below (additional pages may be attached):
_____
_____
_____
_____
_____
_____

I, _____ being duly sworn, deposes and says that he/she is the _____ of

the _____ Corporation and the foregoing is true and accurate.

_____
SIGNED

SWORN to before me this

_____ day of _____

201___
Notary Public: _____

IRAN DIVESTMENT ACT COMPLIANCE RIDER

FOR SCHOOL DISTRICTS

The Iran Divestment Act of 2012, effective as of April 12, 2012, is codified at State Finance Law ("SFL") §165-a and General Municipal Law ("GML") §103-g. The Iran Divestment Act, with certain exceptions, prohibits municipalities, including the District, from entering into contracts with persons engaged in investment activities in the energy sector of Iran. Pursuant to the terms set forth in SFL §165-a and GML §103-g, a person engages in investment activities in the energy sector of Iran if:

(a) The person provides goods or services of twenty million dollars or more in the energy sector of Iran, including a person that provides oil or liquefied natural gas tankers, or products used to construct or maintain pipelines used to transport oil or liquefied natural gas, for the energy sector of Iran; or

(b) The person is a financial institution that extends twenty million dollars or more in credit to another person, for forty-five days or more, if that person will use the credit to provide goods or services in the energy sector in Iran and is identified on a list created pursuant to paragraph (b) of subdivision three of Section 165-a of the SFL and maintained by the Commissioner of the Office of General Services.

A bid or proposal shall not be considered for award nor shall any award be made where the bidder or proposer fails to submit a signed and verified bidder's certification.

Each bidder or proposer must certify that it is not on the list of entities engaged in investment activities in Iran created pursuant to paragraph (b) of subdivision 3 of Section 165-a of the SFL. In any case where the bidder or proposer cannot certify that it is not on such list, the bidder or proposer shall so state and shall furnish with the bid or proposal a signed statement which sets forth in detail the reasons why such statement cannot be made. The District may award a bid to a bidder who cannot make the certificate on a case by case basis if:

(1) The investment activities in Iran were made before the effective date of this section (i.e., April 12, 2012), the investment activities in Iran have not been expanded or renewed after the effective date of this section and the person has adopted, publicized and is implementing a formal plan to cease the investment activities in Iran and to refrain from engaging in any new investments in Iran; or

(2) The District makes a determination that the goods or services are necessary for the District to perform its functions and that, absent an exemption, the District would be unable to obtain the goods or services for which the contract is offered. Such determination shall be made in writing and shall be a public document.

STATEMENT OF BIDDER'S QUALIFICATIONS

1. Name of Bidder:

_____

2. Type of Business Entity:

_____

3. If the bidder is a corporation, state the date and place of incorporation of the corporation. If a partnership, state the date of organization and type of partnership. If individually owned, state the date of organization. If the form of your organization is other than those listed above, please describe.

_____

4. For how many years has the bidder done business under its present name, and how many years has your organization been in business as a contractor?

_____

5a. List the persons who are directors, officers, principals, owners, managerial employees or partners in the bidder's business.

_____

_____

5b. Under what other or former names has your organization operated?

_____

_____

6. Have any of the persons listed in Number 5 owned/operated/been shareholders in any other companies? If so, please state name of the person(s) who has owned/operated/been shareholders and name(s) of other companies:

_____

_____

_____

_____

_____

7. Has your organization ever failed to complete any work awarded to it?

_____

_____

8. Has any director, officer, owner or managerial employee had any professional license suspended or revoked? If the answer to this question is yes, list the name of the individual, the professional license he/she formerly held, whether said license was revoked or suspended and the date of the revocation or suspension.

_____

_____

_____

_____

_____

9. During the three year period preceding the submission of this bid, has the bidder been found guilty of any OSHA Violations? If the answer to this question is yes, describe the nature of the OSHA violation, an explanation of remediation or other steps taken regarding such violation(s).

_____

_____

_____

_____

10. During the five year period preceding the submission of this bid, has the bidder been charged with any claims pertaining to unlawful intimidation or discrimination against any employee by reason of race, creed, color, disability, sex or natural origin and/or violations of an employee's civil rights or equal employment opportunities? If the answer to this question is yes, list the persons making such claim against the bidder, a description of the claim, the status of the claim, and what disposition (if any) ahs been made regarding such claim.

_____

_____

_____

_____

11. During the five year period preceding the submission of this bid, has the bidder been named as a party in any lawsuit in an action involving a claim for personal injury or wrongful death arising from performance or work related to any project in which it has been engaged? If the answer to this question is yes, list all such lawsuits, the index number associated with said suit and the status of the lawsuit at the time of the submission of this bid.

_____

_____

_____

12. During the five year period preceding the submission of this bid, has the bidder been the subject of an investigation and/or proceedings before the Department of Labor for alleged violations of the Labor Law as it relates to the payment of prevailing wages and/or supplemental payment requirements? If the answer to this question is yes, please list each such instance of the commencement of a Department of labor proceeding, for which project such proceeding was commenced, and the status of the proceeding at the time of the submission of this bid.

13. During the five year period preceding the bidder's submission of this bid, has the bidder been the subject of an investigation and/or proceeding before any law enforcement agency, including, but not limited to any District Attorney's Office? If the answer to this question is yes, please list each such instance, the law enforcement agency, the nature of the proceeding, the project for which such proceeding was commenced, if applicable to a project, and the status of the proceeding at the time of the submission of this bid.

14. During the five year period preceding the bidder's submission of this bid, has the bidder been the subject of proceedings involving allegations that it violated the Workers' Compensation Law including, but not limited to the failure to provide proof of worker's compensation or disability coverage and/or any lapses thereof. If the answer to this question is yes, list each such instance of violation and the status of the claimed violation at the time of the submissions of this bid.

_____

_____

_____

_____

_____

15. Has the bidder, its officers, directors, owner and/or managerial employees been convicted of a crime or been the subject of a criminal indictment during the five years preceding the submission of this bid? If the answer to this question is yes, list the name of the individual convicted or indicated, the charge against the individual and the date of disposition of the charge.

_____

_____

_____

_____

_____

16. During the five year period preceding the bidder's submission of this bid, has the bidder been charged with and/or found guilty of any violations of federal, state, or municipal environmental and/or health laws, codes, rules and/or regulations? If the answer to this question is yes, list the nature of the charge against the bidder, the date of the charge, and the status of the charge at the time of the submission of this bid.

17. Does the bidder have any major construction projects ongoing at the time of the submission of this bid? If the answer to this question is yes, list the projects on which the bidder is currently working, the percentage complete, and the owner, architect, contract amount and the expected date of completion of said project. State total worth of work in progress and under contract.

18. Has the bidder ever been terminated from a Project by the Owner? If the answer to this question is yes, list the projects on which the bidder was terminated, the nature of the termination (convenience, suspension, for cause), and the date of said termination.

19. Are there any other judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers?

_____

_____

_____

_____

Dated: By: _____
(Signature)

_____
(Print Name and Title)

Sworn to before me this

_____ day of _____, 201__.

_____
Notary Public

AIA® Document A312™ – 2010

Payment Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT
Date:
Amount: $
Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)

Amount: $
Modifications to this Bond: ☐ None ☐ See Section 18

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	

(Any additional signatures appear on the last page of this Payment Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or **BROKER:**

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

.2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

- **.1** the name of the Claimant;
- **.2** the name of the person for whom the labor was done, or materials or equipment furnished;
- **.3** a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
- **.4** a brief description of the labor, materials or equipment furnished;
- **.5** the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- **.6** the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
- **.7** the total amount of previous payments received by the Claimant; and
- **.8** the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:	_____	Signature:	_____
Name and Title:		Name and Title:	
Address:		Address:	

AIA® Document A312™ – 2010

Performance Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT
Date:
Amount: $
Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)

Amount: $
Modifications to this Bond: ☐ None ☐ See Section 16

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or **BROKER:**

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

.1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

.2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

.3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and

.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address:		Address:	

DRAFT

AIA® Document A132™ – 2019

Standard Form of Agreement Between Owner and Contractor,
Construction Manager as Adviser Edition

AGREEMENT made as of the _____ day of _____ in the year Two Thousand Twenty-Two
(In words, indicate day, month, and year.)

BETWEEN the Owner:
(Name, legal status, address, and other information)

Bedford Central School District
632 South Bedford Road
Bedford, NY 10506

and the Contractor:
(Name, legal status, address, and other information)

« »« »
« »
« »
« »

for the following Project:
(Name, location, and detailed description)

Bedford Central School District
2022 Bond Referendum Capital Project

The Construction Manager:
(Name, legal status, address, and other information)

Arris Contracting Co., Inc.
198 Smith Street
Poughkeepsie, New York 12601

The Architect:
(Name, legal status, address, and other information)

BBS Architects, Landscape Architects and Engineers P.C.
244E Main Street
Patchogue, NY 11772

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Documents A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser. AIA Document A232™–2019 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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TABLE OF ARTICLES

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, the Bidding Documents, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than Modifications, appears in Article 9. The Contractor represents that it has fully reviewed the Contract Documents and agrees that the Contract Documents describe, to the best of the Contractor's knowledge, the Work necessary to furnish and provide (and that the Contractor shall furnish and provide) a fully functioning Project consistent with the Contract Documents.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, or reasonably inferable by the Contractor as necessary to produce the results intended by the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others. It is the intent of the parties to include within the Work any and all labor, materials, equipment and services that, although not expressly indicated in the Contract Documents, are reasonably inferable therefrom to construct complete and workable systems for the satisfactory performance, execution, final completion and use of the Work and Project.

ARTICLE 3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[« X »] The date of this Agreement.

[« »] A date set forth in a notice to proceed issued by the Owner.

[« »] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work. The provisions of this Contract relating to the time for performance and completion of the Work are of the essence of this Contract. Accordingly, time is of the essence respecting the Contract Documents and all obligations there under.

§ 3.3 Substantial Completion of the Project or Portions Thereof

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the date of Substantial Completion of the Work of all of the Contractors for the Project will be:
(Insert the date of Substantial Completion of the Work of all Contractors for the Project.)

The Contractor shall achieve Substantial Completion of the entire Work in accordance with the Milestone Schedule set forth in the Project Manual.

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of all of the Contractors for the Project are to be completed prior to Substantial Completion of the entire Work of all of the Contractors for the Project, the Contractors shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date
Refer to Section _____ – Milestone Schedule	

§ 3.4 When the Work of this Contract, or any Portion Thereof, is Substantially Complete

§ 3.4.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall substantially complete the entire Work of this Contract:
(Check one of the following boxes and complete the necessary information.)

[« »] Not later than « » (« ») calendar days from the date of commencement of the Work.

[« »] By the following date: in accordance with Section _____ – Milestone Schedule set forth in the Project Manual.

§ 3.4.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of this Contract are to be substantially complete prior to when the entire Work of this Contract shall be substantially complete, the Contractor shall substantially complete such portions by the following dates:

Portion of Work	Date to be substantially complete
Refer to Section _____ – Milestone Schedule	

§ 3.4.3 Time is of the essence in the performance of the Contract Documents, including, without limitation, the Substantial Completion dates established herein. The Contractor shall proceed expeditiously with adequate forces and shall use its best efforts to keep the Project on schedule, and the Contractor shall achieve the completion times established within the Contract Documents.

§ 3.4.4 If the Contractor fails to substantially and finally complete the Work of this Contract, or portions thereof, as provided in Section 3.4 herein and the Milestone Schedule in the Project Manual, liquidated damages shall be assessed as set forth in Section 4.3 herein and Section 8.3.6.1 of the AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, as modified (the "General Conditions" or "AIA Document A232–2019").

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be one of the following:
(Check the appropriate box.)

[« X »] Stipulated Sum, in accordance with Section 4.2 below

[« »] Cost of the Work plus the Contractor's Fee, in accordance with Section 4.3 below

[« »] Cost of the Work plus the Contractor's Fee with a Guaranteed Maximum Price, in accordance with Section 4.4 below

(Based on the selection above, complete Section 4.2, 4.3 or 4.4 below.)

§ 4.2 Stipulated Sum

§ 4.2.1 The Contract Sum shall be « » ($ « »), subject to additions and deductions as provided in the Contract Documents. See Contractor's Form of Proposal, which is attached hereto as **Exhibit A**.

§ 4.2.1.1 The Stipulated Sum shall not be adjusted for increased labor or material costs, whether foreseen or unforeseen, which may occur between the date of this Agreement and the Commencement Date, or which may occur between the Commencement Date and the Substantial Completion Date or Dates set forth in this Agreement.

§ 4.2.2 Alternates

§ 4.2.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.2.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price

§ 4.2.4 Unit prices, if any:
(Identify the item and state the unit price, and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.3 Liquidated Damages. The Contractor recognizes that achieving Substantial Completion of the Work in accordance with the time limits set forth in this Agreement and as further set forth in the Project Manual and/or Bidding Documents is a material condition of this Agreement, and that if the Contractor fails to achieve Substantial Completion of the Work, or designated parts thereof, in accordance with such schedule, the Owner will incur damages as a result. The Owner and Contractor agree that the amount of such damages is difficult to ascertain with any precision. Because of the difficulty of ascertaining all resulting and corresponding damages, it is hereby agreed that the Contractor shall be assessed in the amounts provided in Section 8.3.6.1 of the General Conditions for each day the Project, or a specific Work item, is not substantially complete after expiration of the Contract Time for Substantial Completion, and for each day the Project is not finally complete after the expiration of the Contract Time for final completion.

§ 4.3.1 The Contractor acknowledges that the liquidated damages amounts set forth in Section 8.3.6.1 of the General Conditions represent a fair and reasonable estimate of the Owner's probable losses, damages and/or expenses, and are not a penalty, for late completion of the Work and the phases thereof.

§ 4.3.2 The Owner shall be entitled to offset any liquidated damages owed by the Contractor against any amounts owing by the Owner to the Contractor.

§ 4.3.3 The Owner's right to liquidated damages shall survive abandonment of the Work by the Contractor and the Owner's termination of the Contract.

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Construction Manager by the Contractor, and upon certification of the Project Application and Project Certificate for Payment or Application for Payment and Certificate for Payment by the Construction Manager and Architect and issuance by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month.

§ 5.1. Provided that an acceptable Application for Payment, including all required lien waivers and certified payroll, is received by the Construction Manager not later than the twenty-first day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the thirtieth day of the next month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment of the amount certified shall be made by the Owner not later than 60 days after the Construction Manager receives the Application for Payment.

§ 5.1.4 Progress Payments Where the Contract Sum is Based on a Stipulated Sum

§ 5.1.4.1 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work and be prepared in such form and supported by such data to substantiate its accuracy as the Construction Manager and Architect may require. This schedule, unless objected to by the Construction Manager or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.4.2 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment. All progress payments made previous to the last and final payment shall be based on estimates and the right is hereby reserved by the Architect for the Owner to make all due and proper corrections in any payment for any previous error.

§ 5.1.4.3 In accordance with AIA Document A232™–2019, as modified, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.4.3.1 The amount of each progress payment shall first include:

- **.1** That portion of the Contract Sum properly allocable to completed Work;
- **.2** That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- **.3** That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.4.3.2 The amount of each progress payment shall then be reduced by:

- **.1** The aggregate of any amounts previously paid by the Owner;
- **.2** The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;
- **.3** Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- **.4** For Work performed or defects discovered since the last payment application, any amount for which the Owner, Construction Manager or Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019; and
- **.5** Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to when the Work of this Contract is substantially complete, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

Five percent (5%)

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

None.

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to when the entire Work of this Contract is substantially complete, including modifications for completion of portions of the Work as provided in Section 3.4.2, insert provisions for such modifications.)

No retainage reduction prior to Substantial Completion of the entire Work.

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, when the Work of this Contract is substantially complete, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted when the Work of this Contract is substantially complete shall not include retainage as follows:
(Insert any other conditions for release of retainage when the Work of this Contract is substantially complete, or upon Substantial Completion of the Work of all Contractors on the Project or portions thereof.)

Upon Substantial Completion of the Work, the payment shall be less two times the value of any remaining Work to be completed as the Construction Manager recommends and the Architect determines for incomplete Work and an amount necessary to satisfy any claims, liens or judgments against the Contractor that have not been suitably discharged.

§ 5.2 Final Payment

§ 5.2.1 Final Payment Where the Contract Sum is Based on a Stipulated Sum

§ 5.2.1.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A232–2019, as modified, and to satisfy other requirements, if any, which extend beyond final payment;

.2 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect; and

.3 the Contractor has fully performed and complied with the final payment and closeout provisions of Specifications.

§ 5.2.1.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment.

§ 5.3 Payments due and unpaid under the Contract shall bear interest from the date payment is due in accordance with Section 106-b(1)(b) of the New York State General Municipal Law.

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as Initial Decision Maker pursuant to Article 15 of AIA Document A232–2019, as modified.

§ 6.2 Binding Dispute Resolution

For any Claim, dispute or other matter in controversy arising out of or related to the Contract, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[« »] Arbitration pursuant to Article 15 of AIA Document A232–2019.

[« X »] Litigation in a court of competent jurisdiction in Westchester County, NY.

[« »] Other: *(Specify)*

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 Where the Contract Sum is a Stipulated Sum

§ 7.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2019, as modified.

§ 7.1.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2019, as modified.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2019, as modified, or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

Tom Cole
Interim Assistant Superintendent for Business and Administrative Services
Bedford Central School District
632 South Bedford Road
Bedford, New York 10506
tcole0206@bcsdny.org

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

« »
« »
« »
« »
« »
« »

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in Article 11 of AIA Document A232–2019, as modified, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in Article 11 of AIA Document A232–2019, as modified, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A232–2019, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:
(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they will endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

§ 8.7 Intentionally omitted.

§ 8.8 Other provisions:

§ 8.8.1 The Contractor represents and warrants the following to the Owner (in addition to any other representations and warranties contained in the Contract Documents) as an inducement to the Owner to execute this Agreement, which representations and warranties shall survive the execution and delivery of this Agreement, any termination of this Agreement and the final completion of the Work:

.1 that it and its Subcontractors are financially solvent, able to pay all debts as they mature and possessed of sufficient working capital to complete the Work and perform all obligations hereunder;

.2 that it is able to furnish the plant, tools, materials, supplies, equipment and labor required to complete the Work and perform its obligations hereunder;

.3 that it is authorized to do business in the State of New York and the United States and properly licensed by all necessary governmental and public and quasi-public authorities having jurisdiction over it and over the Work and the Project;

.4 that its execution of this Agreement and its performance thereof is within its duly authorized powers;

.5 that its duly authorized representative has visited the site of the Project, is familiar with the local and special conditions under which the Work is to be performed and has correlated on-site observations with the requirements of the Contact Documents; and

.6 that it possesses a high level of experience and expertise in the business administration, construction, construction management and superintendence or projects of the size, complexity and nature of the particular Project, and that it will perform the Work with the care, skill and diligence of such a contractor.

The foregoing warranties are in addition to, and not in lieu of, any and all other liability imposed upon the Contractor by law with respect to the Contractor's duties, obligations and performance hereunder. The Contractor's liability hereunder shall survive the Owner's final acceptance of and payment for the Work. All representations and warranties set forth in this Agreement, including without limitation, this Section 8.8.1, shall survive the final completion of the Work or the earlier termination of this Agreement. The Contractor acknowledges that the Owner is relying upon the Contractor's skill and experience in connection with the Work called for hereunder.

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition

.2 Not used

.3 AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition

.4 Not used

.5 Drawings

Refer to the attached Exhibit B, List of Drawings – Project Manual, all of which drawings listed therein are incorporated herein by reference.

.6 Specifications

Refer to the attached Exhibit C, Table of Contents – Project Manual, all of which sections listed therein are incorporated herein by reference.

.7 Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[« »] AIA Document A132™–2019, Exhibit B, Determination of the Cost of the Work

[« »] AIA Document E235™–2019, Sustainable Projects Exhibit, Construction Manager as Adviser Edition, dated as indicated below:
(Insert the date of the E235-2019 incorporated into this Agreement.)

« »

[« »] The Sustainability Plan:

Title	Date	Pages

[« »] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A232–2019 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

Exhibit A	Contractor's Form of Proposal
Exhibit B	List of Drawings
Exhibit C	Specifications Table of Contents

This Agreement is entered into as of the day and year first written above.

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
Edward Reder, Board of Education President	« »« »
(Printed name and title)	*(Printed name and title)*

Application and Certificate for Payment

The following AIA Document G702 or G732 and G703 shall be utilized.

The General Conditions and Supplemental Conditions (if any) state required accompanying documents.

Applications and Certificates for Payment shall be assembled and transmitted as follows:

- Provide four original Applications and Certificates for Payment if there is a Construction Manager, three originals if not. One original and photocopies are unacceptable.

- If there is a Construction Manager, utilize the Construction Manager-edition AIA Application and Certificate for Payment, and the Construction Manager must have signed all originals before transmitting them to BBS.

- Lien Releases and Affidavits are required for every Application and Certificate for Payment except the first.

- Certified Payroll is required for every Application and Certificate for Payment that includes any amount of labor.

- The first Application and Certificate for Payment will not be processed until acceptable Bonds and Insurances are submitted and approved.

- The first Application and Certificate for Payment that includes any amount of labor, and thus Certified Payroll, must contain OSHA 10 cards. OSHA 10 cards must also be provided on subsequent Applications and Certificates for Payment where any new or additional worker is employed.

- The four or three original Applications and Certificates for Payment shall be complete and separate packages; all attachments must be affixed to every original application.

The Architect/Engineer and/or Construction Manager will not disassemble, rearrange, or reproduce any Application and Certificate for Payment, or portion thereof, to bring them into compliance. Incomplete or improperly arranged Applications and Certificates for Payment will be rejected and returned to the Contractor.

AIA® Document G732™ – 2009

Application and Certificate for Payment, Construction Manager as Adviser Edition

TO OWNER:

PROJECT: Tempalte

APPLICATION NO:

DISTRIBUTION TO:
OWNER
CONSTRUCTION MANAGER
ARCHITECT
CONTRACTOR
FIELD
OTHER

PERIOD TO:

CONTRACT DATE:

PROJECT NOS: / /

FROM CONTRACTOR:

CONTRACT FOR: General Construction

VIA CONSTRUCTION MANAGER:

VIA ARCHITECT:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
AIA Document G703™, Continuation Sheet, is attached.

1. **ORIGINAL CONTRACT SUM** ..... $
2. **NET CHANGES IN THE WORK** ..... $ 0.00
3. **CONTRACT SUM TO DATE** *(Line 1 ± 2)* ..... $ 0.00
4. **TOTAL COMPLETED AND STORED TO DATE** *(Column G on G703)* .... $
5. **RETAINAGE:**
   a. 0 % of Completed Work
   (Column D + E on G703) $ 0.00
   b. 0 % of Stored Material
   (Column F on G703) $ 0.00

   Total Retainage *(Lines 5a + 5b, or Total in Column I on G703)*..... $ 0.00
6. **TOTAL EARNED LESS RETAINAGE** ..... $ 0.00
   (Line 4 minus Line 5 Total)
7. **LESS PREVIOUS CERTIFICATES FOR PAYMENT** ..... $
   (Line 6 from prior Certificate)
8. **CURRENT PAYMENT DUE** ..... $ 0.00
9. **BALANCE TO FINISH, INCLUDING RETAINAGE**
   (Line 3 minus Line 6) $ 0.00

SUMMARY OF CHANGES IN THE WORK	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$	$
Total approved this month including Construction Change Directives	$	$
TOTALS	$ 0.00	$ 0.00
NET CHANGES IN THE WORK	$ 0.00	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of:

County of:

Subscribed and sworn to before me this day of

Notary Public:

My Commission expires:

CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on evaluations of the Work and the data comprising this application, the Construction Manager and Architect certify to the Owner that to the best of their knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED ..... $

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

CONSTRUCTION MANAGER:

By: _____ Date: _____

ARCHITECT: *(NOTE: If Multiple Prime Contractors are responsible for performing portions of the Project, the Architect's Certification is not required.)*

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

AIA® Document G703™ – 1992

Continuation Sheet

AIA Document, G702™–1992, Application and Certification for Payment, or G736™–2009, Project Application and Project Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached.
In tabulations below, amounts are in US dollars.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED FROM PREVIOUS APPLICATION (D + E)	WORK COMPLETED THIS PERIOD	MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
						0.00	0.00 %	0.00	
	GRAND TOTAL	$0.00	$0.00	$0.00	$0.00	$0.00	0.00 %	$0.00	$0.00

AGENCY CUSTOMER ID: _____

NEW YORK CONSTRUCTION CERTIFICATE OF LIABILITY INSURANCE ADDENDUM

DATE (MM/DD/YYYY)

THIS ADDENDUM SUMMARIZES SOME OF THE POLICY PROVISIONS IN THE REFERENCED INSURANCE POLICIES AND IS ISSUED AS A MATTER OF INFORMATION ONLY; IT CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. ALL TERMS, EXCLUSIONS AND CONDITIONS IN THE ACTUAL POLICY SHOULD BE CONSULTED FOR A MORE DETAILED ANALYSIS OF COVERAGE, AS THIS ADDENDUM DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES.

AGENCY		NAMED INSURED(S)	
POLICY NUMBER	EFFECTIVE DATE	CARRIER	NAIC CODE

ADDENDUM INFORMATION **CERTIFICATE NUMBER:** **REVISION NUMBER:**

A. Insurer

☐ Admitted / authorized

☐ Excess line or free trade zone

B. General Liability (GL) policy form

☐ ISO / ISO modified

☐ Other

C. Specific operations excluded or restricted (GL policy)

☐ Location: _____

☐ Type of construction: _____

☐ Building height: _____

☐ Classifications [see attached declarations / endorsement]

☐ Designated work [see attached endorsement]

D. Additional insured endorsement (GL policy)

☐ CG 20 10 ☐ CG 20 26 ☐ CG 20 32 ☐ CG 20 33 ☐ CG 20 37 ☐ CG 20 38

☐ Other: #: _____ Title: _____

E. According to the terms of this GL policy, the additional insured has primary and noncontributory coverage

☐ Yes ☐ No and ☐ no other option is available with this insurer

F. Additional insured will receive advance notice if insurer cancels (GL policy)

☐ Yes ☐ No and ☐ no other option is available with this insurer

G. Blanket contractual liability located in the "insured contract" definition (Section V, Number 9, Item f. in the ISO CGL policy) is removed or restricted

☐ Yes and ☐ no other option is available with this insurer ☐ No changes made

H. "Insured contract" exception to the employers liability exclusion is removed or modified (GL policy)

☐ Yes and ☐ no other option is available with this insurer ☐ No changes made

I. GL policy (including endorsements) does not cover the additional insured for claims involving injury to employees of the named insured or subcontractors (not workers' compensation)

☐ Yes and ☐ no other option is available with this insurer ☐ No changes made

J. Earth movement, excavation or explosion / collapse / underground property damage is excluded or restricted (GL policy)

☐ Yes and ☐ no other option is available with this insurer ☐ No changes made

K. Insured vs. insured suits (cross liability in the ISO CGL policy) are excluded or restricted (other than named insured vs. named insured)

☐ Yes and ☐ no other option is available with this insurer ☐ No changes made

L. Property damage to work performed by subcontractors (exception to the "damage to your work" exclusion in the ISO CGL policy) is excluded or restricted

☐ Yes and ☐ no other option is available with this insurer ☐ No changes made

M. Excess / umbrella policy is primary and non-contributory for additional insureds

☐ Yes, by specific policy provision ☐ Yes, by endorsement ☐ No and ☐ no other option is available with this insurer

_____ _____

AUTHORIZED REPRESENTATIVE SIGNATURE DATE (MM/DD/YYYY)

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS – COMPLETED OPERATIONS

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s)	Location And Description Of Completed Operations
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

A. **Section II – Who Is An Insured** is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury" or "property damage" caused, in whole or in part, by "your work" at the location designated and described in the Schedule of this endorsement performed for that additional insured and included in the "products-completed operations hazard".

However:

1. The insurance afforded to such additional insured only applies to the extent permitted by law; and
2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following is added to **Section III – Limits Of Insurance:**

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or
2. Available under the applicable Limits of Insurance shown in the Declarations;

whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS – AUTOMATIC STATUS FOR OTHER PARTIES WHEN REQUIRED IN WRITTEN CONSTRUCTION AGREEMENT

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

A. **Section II – Who Is An Insured** is amended to include as an additional insured:

1. Any person or organization for whom you are performing operations when you and such person or organization have agreed in writing in a contract or agreement that such person or organization be added as an additional insured on your policy; and

2. Any other person or organization you are required to add as an additional insured under the contract or agreement described in Paragraph **1.** above.

Such person(s) or organization(s) is an additional insured only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by:

a. Your acts or omissions; or

b. The acts or omissions of those acting on your behalf;

in the performance of your ongoing operations for the additional insured.

However, the insurance afforded to such additional insured described above:

a. Only applies to the extent permitted by law; and

b. Will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

A person's or organization's status as an additional insured under this endorsement ends when your operations for the person or organization described in Paragraph **1.** above are completed.

B. With respect to the insurance afforded to these additional insureds, the following additional exclusions apply:

This insurance does not apply to:

1. "Bodily injury", "property damage" or "personal and advertising injury" arising out of the rendering of, or the failure to render, any professional architectural, engineering or surveying services, including:

a. The preparing, approving, or failing to prepare or approve, maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings and specifications; or

b. Supervisory, inspection, architectural or engineering activities.

This exclusion applies even if the claims against any insured allege negligence or other wrongdoing in the supervision, hiring, employment, training or monitoring of others by that insured, if the "occurrence" which caused the "bodily injury" or "property damage", or the offense which caused the "personal and advertising injury", involved the rendering of, or the failure to render, any professional architectural, engineering or surveying services.

2. "Bodily injury" or "property damage" occurring after:

a. All work, including materials, parts or equipment furnished in connection with such work, on the project (other than service, maintenance or repairs) to be performed by or on behalf of the additional insured(s) at the location of the covered operations has been completed; or

b. That portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the same project.

C. With respect to the insurance afforded to these additional insureds, the following is added to **Section III – Limits Of Insurance:**

The most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement described in Paragraph **A.1.;** or

2. Available under the applicable Limits of Insurance shown in the Declarations;

whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS

FREDERICK W. SEEBA, PE, MANAGING PARTNER
LAWRENCE SALVESEN, AIA, PARTNER
KEVIN J. WALSH, AIA, PARTNER
KENNETH G. SCHUPNER, AIA, PARTNER
JOSEPH B. RETTIG, AIA, PARTNER
GARY W. SCHIEDE, AIA, PARTNER
ROGER P. SMITH, AIA, FOUNDING PRINCIPAL

Date: _____

Owner: _____

Project: _____

Contractor: _____

Dear Sir/Madam:

Reference is made to your contract with _____ for the above referenced Project. By signing below, you hereby acknowledge and agree, that for valuable consideration, the receipt of which is acknowledged, you covenant and agree that BBS Architects, Landscape Architects & Engineers PC, shall be added as an "additional insured" to your casualty and commercial liability insurance policies required under the Contract, including all primary and excess policies, limits, and terms and conditions contained therein, and further agree that an insurance certificate and endorsement confirming that this entity was added as an "additional insured" on such policies of insurance shall be provided by you prior to the commencement of work onthe Project.

In addition, you further covenant and agree to hold harmless, indemnify and defend BBS Architects, Landscape Architects, and Engineers, PC to the same extent that you are required to hold harmless, indemnify and defend the Owner under the Contract, however, Contractor is not responsible for defense and indemnity for claims, demands or suits caused solely by Architect's professional negligence.

Acknowledged and agreed to by:

_____
Name

_____
Signature

_____
Contractor

Rev. 12-31-18

SECTION 00 45 03 – INSURANCE CERTIFICATION FORM

Name of Project: **Bedford Central School District Phase 1A**

Your insurance representative must complete the form below in order to be considered for the award of this bid or project, and it is important that you complete the Bidder's Acknowledgement section of this form. Please note that this Insurance Certification form must accompany your bid submission in order for your bid to be considered.

Insurance Representative's Acknowledgement:
We have reviewed the insurance requirements set forth in Article 11 of the General Conditions of the Contract for Construction (AIA A232-2019) and are capable of providing such insurance to our insured in accordance with such requirements in the event the contract is awarded to our insured and provided our insured pays the appropriate premium.

Insurance Representative:

_____

Insurance Representative Address:

_____

_____

Are you an agent for the companies providing the coverage? Yes__ No__

Date: _____ _____
Insurance Representative Signature

Bidder's Acknowledgement:

I acknowledge that I have received the insurance requirements of this bid and have considered the costs, if any, of procuring the required insurance and will be able to supply the insurance required in accordance with the bid, if it is awarded. I understand that this Insurance Certification form must be submitted with my bid and my inability to provide the required insurances may result in the rejection of my bid, and the Bedford Central School District may award the contract to the next lowest/responsive bidder.

Bidder name: _____

Address: _____

_____

Date: _____ _____
Bidder's Signature

SECTION 00 45 22 - SEXUALHARASSMENT PREVENTION CERTIFICATION FORM

Bedford CSD – Phase 1A Project

By submission of this bid, the person signing on behalf of the bidder certifies, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all of its employees. Such policy shall, at a minimum, meet the requirements of Section 201-g of the Labor Law.

Bidder Name: _____

Bidder Address: _____

Signature: _____

Print Name and Title: _____

Date: _____

AIA® Document G706™ – 1994

Contractor's Affidavit of Payment of Debts and Claims

PROJECT: *(Name and address)*	**ARCHITECT'S PROJECT NUMBER:**	OWNER: ☐
		ARCHITECT: ☐
	CONTRACT FOR:	CONTRACTOR: ☐
TO OWNER: *(Name and address)*	**CONTRACT DATED:**	SURETY: ☐
		OTHER: ☐

STATE OF:
COUNTY OF:

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Consent of Surety to Final Payment. Whenever Surety is involved, Consent of Surety is required. AIA Document G707, Consent of Surety, may be used for this purpose

Indicate Attachment ☐ Yes ☒ No

The following supporting documents should be attached hereto if required by the Owner:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.

2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

3. Contractor's Affidavit of Release of Liens (AIA Document G706A).

CONTRACTOR: *(Name and address)*

BY: _____
(Signature of authorized representative)

_____
(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:
My Commission Expires:

AIA® Document G706A™ – 1994

Contractor's Affidavit of Release of Liens

PROJECT: *(Name and address)*	**ARCHITECT'S PROJECT NUMBER:**	OWNER: ☐ ARCHITECT: ☐ CONTRACTOR: ☐
TO OWNER: *(Name and address)*	**CONTRACT FOR:** **CONTRACT DATED:**	SURETY: ☐ OTHER: ☐

STATE OF:
COUNTY OF:

The undersigned hereby certifies that to the best of the undersigned's knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.

2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

CONTRACTOR: *(Name and address)*

BY:

(Signature of authorized representative)

(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:
My Commission Expires:

AIA® Document G707™ – 1994

Consent Of Surety to Final Payment

PROJECT: *(Name and address)*	**ARCHITECT'S PROJECT NUMBER:**	OWNER: ☐
	CONTRACT FOR:	ARCHITECT: ☐
TO OWNER: *(Name and address)*	**CONTRACT DATED:**	CONTRACTOR: ☐
		SURETY: ☐
		OTHER: ☐

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of Surety)

, SURETY,

on bond of
(Insert name and address of Contractor)

, CONTRACTOR,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety of any of its obligations to
(Insert name and address of Owner)

, OWNER,

as set forth in said Surety's bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:
(Insert in writing the month followed by the numeric date and year.)

_____
(Surety)

_____
(Signature of authorized representative)

Attest:
(Seal):

_____
(Printed name and title)

AIA® Document G707A™ – 1994

Consent of Surety to Reduction in or Partial Release of Retainage

PROJECT: *(Name and address)*	**ARCHITECT'S PROJECT NUMBER:**	OWNER: ☐
	CONTRACT FOR: n	ARCHITECT: ☐
TO OWNER: *(Name and address)*	**CONTRACT DATED:**	CONTRACTOR: ☐
		SURETY: ☐
		OTHER: ☐

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of Surety)

, SURETY,

on bond of
(Insert name and address of Contractor)

, CONTRACTOR,

hereby approves the reduction in or partial release of retainage to the Contractor as follows:

The Surety agrees that such reduction in or partial release of retainage to the Contractor shall not relieve the Surety of any of its obligations to
(Insert name and address of Owner)

, OWNER,

as set forth in said Surety's bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:
(Insert in writing the month followed by the numeric date and year.)

_____
(Surety)

_____
(Signature of authorized representative)

Attest:
(Seal):

_____
(Printed name and title)

DRAFT

AIA® Document A232™ – 2019

General Conditions of the Contract for Construction,
Construction Manager as Adviser Edition

for the following PROJECT:
(Name, and location or address)

Bedford Central School District
2022 Bond Referendum Capital Project

THE CONSTRUCTION MANAGER:
(Name, legal status, and address)

Arris Contracting Co., Inc.
198 Smith Street
Poughkeepsie, New York 12601

THE OWNER:
(Name, legal status, and address)

Bedford Central School District
632 South Bedford Road
Bedford, NY 10506

THE ARCHITECT:
(Name, legal status, and address)

BBS Architects, Landscape Architects and Engineers P.C.
244E Main Street
Patchogue, NY 11772

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Documents A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser.

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Error! No property name supplied.

TABLE OF ARTICLES

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents. The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter, the "Agreement"), and consist of the Bidding Documents (including, but not limited to, Invitations to Bid, Instructions to Bidders, sample forms, the Contractor's bid or portions of the addenda relating to bidding requirements), the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect.

§ 1.1.2 The Contract. The Contract Documents form the Contract for Construction (hereinafter, the "Contract"). The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and the Construction Manager or the Construction Manager's consultants, (3) between the Owner and the Architect or the Architect's consultants, (4) between the Contractor and the Construction Manager or the Construction Manager's consultants, (5) between the Owner and a Subcontractor or Sub-subcontractor (6) between the Construction Manager and the Architect, or (7) between any persons or entities other than the Owner and Contractor. The Construction Manager and Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of their duties. Subcontractors shall assume the same obligations to the Contractor as the Contractor has to the Owner and the Architect, including but not limited to the obligations set forth in these General Conditions. All relationships and responsibilities of the Contractor to the Owner, Construction Manager or Architect as defined in these General Conditions shall become those of the Subcontractor to the Contractor.

§ 1.1.2.1 Where the term "Agreement," "Contract" or "Prime Contract" is used in these General Conditions, and other Contract Documents, it shall mean the separate Owner-Contractor Agreement between the Owner and each Multiple Prime Contractor identified in Conditions of the Contract (General, Supplementary and other conditions).

§ 1.1.2.2 The Contractor acknowledges and warrants that it has closely examined all the Contract Documents, that they are suitable and sufficient to enable the Contractor to complete the Work in a timely manner for the Contract Sum, and that they include all work, whether or not shown or described, which reasonably may be inferred to be required or useful for the completion of the Work in full compliance with all applicable statutes, codes, laws, ordinances and regulations.

§ 1.1.3 The Work. The term "Work" means the construction and services required by the Contract Documents, or as reasonably inferable therefrom, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project. The Work includes all of the Contractor's responsibilities as to all labor, parts, supplies, equipment, skill, supervision, transportation services, storage requirements, and other facilities and things necessary, proper or incidental to the carrying out and completion of the terms of the Contract Documents and all other items of cost or value needed to produce, construct, and fully complete the Contractor's Work identified by the Contract Documents.

§ 1.1.4 The Project. The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by other Contractors, and by the Owner's own forces and Separate Contractors.

§ 1.1.5 Contractors. Contractors are persons or entities, other than the Contractor or Separate Contractors, who perform Work under contracts with the Owner that are administered by the Architect and Construction Manager.

§ 1.1.6 Separate Contractors. Separate Contractors are persons or entities who perform construction under separate contracts with the Owner not administered by the Architect and Construction Manager.

§ 1.1.7 The Drawings. The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams. The Drawings are as listed within the "List of Drawings" provided with the drawing set. All Work under

the Contract shall be executed in accordance with the Contract Documents, which are complimentary as described herein. The "List of Drawings" is incorporated in the Standard Form of Agreement Between the Owner and the Contractor.

§ 1.1.8 The Specifications. The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services and general requirements for the Project.

§ 1.1.9 Instruments of Service. Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials including those in electronic form.

§ 1.1.10 Initial Decision Maker. The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.1.11 Miscellaneous Definitions

§ 1.1.11.1 The terms "knowledge," "recognize" and "discover," their respective derivatives and similar terms in the Contract Documents, as used in reference to the Contractor, shall be interpreted to mean that which the Contractor knows (or should know), recognizes (or should recognize) and discovers (or should discover) in exercising the care, skill, and diligence required by the Contract Documents. The expression "reasonably inferable" and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a contractor familiar with the Project and exercising care, skill, and diligence required of the Contractor by the Contract Documents.

§ 1.1.11.2 The term "any" in the Contract Documents shall be interpreted as "any and all" whenever one or more than one item would be applicable for completion of the Work.

§ 1.1.11.3 Except as otherwise explicitly provided, the words "approved" or "approval" shall mean the written approval of the Architect or the Construction Manager, or both.

§ 1.1.11.4 "Accepted," "directed," "permitted," "requested," "required," and "selected" are used herein as term connections and unless specifically noted otherwise are to mean "accepted by the Architect," "directed by the Architect," "permitted by the Architect," "requested by the Architect," "required by the Architect," and "selected by the Architect." However, no such implied meaning will be interpreted to extend the Architect's responsibility into the Contractor's areas of construction supervision.

§ 1.1.11.5 The term "as indicated" or "as shown" shall mean "as indicated in the Contract Documents."

§ 1.1.11.6 The term "include" in any form other than "inclusive" is non-limiting and not intended to mean "all inclusive."

§ 1.1.11.7 The terms "furnish" and "furnish all materials," unless specifically noted otherwise, mean "pay for, supply and deliver to the job site all new materials, systems, equipment, product, and/or other items so specified."

§ 1.1.11.8 The terms "install" and "furnish all labor," unless specifically noted otherwise, mean "pay for, perform all operations connected with installation of Work including unloading new product to be installed, supplying all necessary equipment and rigs to do the Work, test, place in operation and service, and remove all packing material."

§ 1.1.11.9 The term "product" includes materials, systems, equipment, and other items to be incorporated into the Work.

§ 1.1.11.10 The term "provide," unless specifically noted otherwise, means "furnish new, install, connect up, complete, test and place in operation and service."

§ 1.1.11.11 The term "replace" or similar term shall mean "restore," "renew," "make good," "reconstruct," or "as applicable using new product."

§ 1.1.11.12 The term "concealed" as used herein shall mean items hidden from sight in such locations as trenches, chases, shafts, furred spaces, walls, slabs, above ceilings and where in sight in crawl spaces or service tunnels.

§1.1.11.13 The term "exposed" as used herein shall mean not "concealed" as defined herein and the spaces behind normally closed doors such as interiors of cabinets.

§ 1.1.11.14 The terms "manufacturer" or "supplier" mean any person or entity which contracts to furnish materials to a Contractor, Subcontractor, or any Sub-subcontractor for use at the site of the Project.

§ 1.1.11.15 "Wiring" shall be understood to mean wires or cables with conduit, fittings, boxes, etc., installed complete.

§ 1.1.11.16 "Piping" shall be understood to mean all pipes, fittings, nipples, valves and all accessories connected thereto.

§ 1.1.11.17 The Contract Time is the period of time specified in Article 3 of the Agreement for completion of the Work.

§ 1.1.11.18 "Project Manual" is a volume assembled for the Work that includes the Instructions to Bidders, General Conditions, Supplementary General Conditions, the Specifications, and all Addenda issued prior to execution of the Contract. The Project Manual will additionally include bidding requirements and documents and sample forms.

§ 1.1.11.19 Terms not otherwise defined herein shall have the meanings set forth elsewhere in the Contract Documents.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. It is intended that all plumbing, mechanical, electrical, and other systems will be complete and in proper operation, and that all construction components, whether part of such systems or otherwise, will be complete and in compliance with accepted construction practice upon completion of the Work. Even if items are missing from the Drawings or Specifications, but are normally required for proper operation of plumbing, mechanical, electrical, and other systems, or to complete otherwise incomplete construction, or to meet governing code requirements, they shall be included by the Contractor, unless he sought and received contradictory interpretation or clarification from the Architect.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.1.2 The Contractor and its Subcontractors shall evaluate and satisfy themselves as to the conditions and limitations under which the Work is to be performed, including without limitation (1) location, layout, and nature of the Project site and surrounding areas, including generally prevailing climatic conditions, (2) existing building and site conditions, (3) anticipated labor supply and costs, (4) availability and cost of materials, tools, equipment, (5) Owner occupancy requirements and constraints, (6) site safety logistics plan and any phased construction plan and (7) other similar issues. The Owner assumes no responsibility or liability for the physical condition or safety of the Project site or any improvements located on the Project site. The Contractor shall be solely responsible for providing a safe place for the performance of the Work. No adjustments will be made in either the Contract Sum or Contract Time for any failure by the Contractor or any Subcontractor to comply with the requirements of this Section 1.2.1.2.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade. Instructions and other information furnished in the Specifications including without limitation, items in connection with prefabricated or prefinished items, are not intended to supersede work agreements between employers and employees. Should the Specifications conflict with such work agreements, the

work agreements shall be followed, provided such items are provided and finished as specified. If necessary, such work shall be performed on the project Site, instead of at the shop, by appropriate labor and in accordance with the requirements of the Drawings and Specifications. It shall be the Contractor's responsibility, when subcontracting any portion of his Work, to arrange or group items of work under particular trades to conform with the then prevailing customs of the trade, regardless of the particular Divisions and Sections of the Specifications in which the work is described.

§ 1.2.2.1 The Work on the Project will be separated into individual and separate contracts. It is the intent of these requirements to include all items of Work for a complete Project in the separate contracts. The Contractor shall be responsible for understanding and knowing under which contract each item of Work is included.

§ 1.2.2.2 Each section or division of the Specifications has been assigned to one of the contract scopes. Where a section of the Specification is referenced in the contract scope, then any and all items necessary for the proper and normal installation of the item referenced in the Specification section shall be included whether specifically indicated in the Contract Documents or not.

§ 1.2.2.3 The reference of the "Specifications" regarding the division or separation of the work among types of trades or occupations is only for the suggested purpose of coordinating the work of the different trades, etc. but it shall be the Contractor's entire responsibility for the proper coordination and completion of all the Work described in the "Specifications" whether performed by the Contractor or its Subcontractors, if any. It shall be the Contractor's responsibility to settle definitely with each of its Subcontractors the portions of the Work, which each will be required to do and the Owner and Architect assume no responsibility whatever for any jurisdiction claimed by any of the trades involved in the Work. The Contractor shall provide each item listed, of quality noted and subject to the qualifications noted, and shall perform operations prescribed according to the conditions stated, including specified operations, processes or methods, furnishing all necessary labor, materials, equipment and incidentals required to complete the Work.

§ 1.2.2.4 The Contractor acknowledges that the coordination requirements and the construction schedule of this Project will require close cooperation and coordination between all Contractors on the Project site.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.2.4 In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities:

- **.1** Change Orders;
- **.2** The Agreement between Owner and Contractor;
- **.3** Addenda, with those of later date having precedence over those of earlier date;
- **.4** The Supplementary, Special, or other Conditions as may be part of the Contract Documents;
- **.5** The General Conditions of the Contract for Construction;
- **.6** Drawings and Specifications. In the case of an inconsistency between Drawings and Specifications or within either document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation. If a work item or component is present in the Drawings but not the Specifications, or vice versa, that work or component shall be provided.

§ 1.2.5 Notwithstanding Section 1.2.4, in the event of inconsistencies within or between parts of the Contract Documents or between the Contract Documents and applicable standards, codes and ordinances, the Contractor shall (1) provide the better quality or greater quantity of work or (2) comply with the more stringent requirements; either or both in accordance with the Architect's interpretation. Where the Contractor perceives a conflict, it shall inform the Architect and Owner thereof and request a decision from the Architect, which shall be promptly communicated by the Architect to the Contractor so as not to cause any delay in the performance of the Work. Any Work performed after perceiving the conflict and prior to resolution by the Architect shall be at the Contractor's risk. The terms and provisions of this Section 1.2.5, however, shall not relieve the Contractor of any of the obligations set forth elsewhere herein.

- **.1** The Contractor shall not scale Drawings. Dimensions on large scale drawings take precedence over dimensions on small scale drawings. The Contractor shall notify the Architect if additional dimensions are needed. The Contractor shall field verify all dimensions.
- **.2** Before ordering any materials or doing any work, the Contractor and each Subcontractor shall verify measurements at the Project Site and shall be responsible for the correctness of such measurements.

The Contractor shall confirm all dimensions by field measuring. No extra charge or compensation will be allowed on account of differences between actual dimensions and the dimensions indicated on the Drawings. Any difference that may be found shall be submitted to the Architect for resolution before proceeding with the Work.

.3 If a minor change in the Work is found necessary due to actual field conditions, the Contractor shall submit detailed drawings of such departure for the approval by the Architect before making the change.

.4 Certain portions of the Specifications are written in condensed outline form and omitted words are to be supplied by inference. Naming of an article or operations shall have the effect of stating "Contractor shall furnish, install and complete" said operation or article unless it is further qualified in the context in which it appears.

.5 When reference is made to specifications of a manufacturer, trade association, governmental agency, reference standard or similar source (such as ASTM, ASA, AISC, ACI, etc.) such is made part of the Drawings and Specifications, having the force and effect as though reproduced therein, and upon entering into the Contract the Contractor acknowledges his familiarity with those pertaining to its Work. Furthermore, all Work mentioned or indicated in the Contract Documents shall be performed by the Contractor as part of the Contract unless it is specifically indicated in the Contract Documents that such work is to be done by others. All Work shall conform to the National Electric Code, New York State Uniform Fire Prevention and Building Code, and amendments thereto, New York State Energy Conservation Construction Code, State Education Department Manual of Planning Standards, New York State Department of Transportation, Office of Engineering, Standard Specification, Construction and Materials, latest edition, Life Safety Code – NFPA, and applicable City and State Building Codes and Authorities having jurisdiction. The date of the reference standard shall be the latest edition at the time of signing the Contract except as specifically indicated otherwise.

.6 The Contract Drawings are intended to show the general arrangement, design, and extent of the Work and are partly diagrammatic. They are not intended to be scaled for any purpose, or to serve as shop drawings. The Contractor and its Subcontractors will cooperate with all other contractors and their respective subcontractors in determining the construction of systems, running of pipe, and locating equipment. The Contractor agrees that the failure to repeat typical details, figures, or notes on all Contract Drawings or other Contract Documents will not be a basis for claims for additional cost or time.

.7 Any necessary variations in routing or installation shall be made to conform to the intent of the Contract Documents without additional costs. Where there are intersections or obstructions involving ducts, piping, or any other equipment requiring offset of materials, the Contractor acknowledges that it gave particular consideration to clearances in advance of submitting its bid, and that no additional costs for these issues will be considered by the Owner.

.8 If conflicting conditions or interferences develop, the Contractor and its Subcontractors will confer with the other contractors and their respective subcontractors whose work is affected to determine a solution acceptable to all interested parties. The suggested solution shall be submitted to the Architect for comment and, if necessary, written approval.

.9 The Contract Documents intend a first class finished product of such character and quality as described in and reasonably inferred from the Contract Documents. The Contractor will perform its Work to be complete and operable, fitting with the work of other contractors and the Owner, and in compliance with best construction practices and the ordinances, codes, and regulations of all bodies or persons having governmental or regulatory authority over the Contractor and its Work.

§ 1.2.6 Execution of the Contract by the Contractor is a representation that the Contractor has carefully examined the Contract Documents and the Project site, and represents that the Contractor is thoroughly familiar with the nature and location of the Work, the Project site, the specific conditions under which the Work is to be performed, and all matters which may in any way affect the Work or its performance. The Contractor further represents that as a result of such examinations and investigations, the Contractor thoroughly understands the Contract Documents and their intent and purpose, and is familiar with all applicable codes, ordinances, laws, regulations, and rules as they apply to the Work, and that the Contractor will abide by same. Claims for additional time or additional compensation as a result of the Contractor's failure to follow the foregoing procedure and to familiarize itself with all conditions and the Contract Documents will not be permitted.

§ 1.2.6.1 The Contractor certifies that it is experienced and familiar with the requirements and conditions imposed during the construction of similar work in the area. This includes, but is not limited to, "out of sequence" or "come back" work for the removal of plant, equipment, temporary wiring or plumbing, etc. This "out of sequence" work

may also include phasing of construction activities to accommodate the installation of the Work at various locations and orderly fashion and the completion of Work at various locations or levels at various times. This "phasing," "out of sequence," or "come back" work shall be done at no cost to other Contractors, the Owner or Architect.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, sub-subcontractors, and suppliers do not own and cannot claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants. Nothing in this Section 1.5 shall be construed to alter the rights of the Owner toward the Instruments of Service and other documents prepared by the Architect and the Architect's consultants as set forth in the agreement between the Owner and the Architect.

§ 1.5.3 The Contractor may not reproduce the Contract Documents in whole or in part for use as shop drawing backgrounds without the prior written consent of the Architect. If consent is given, the Architect shall determine the extent that the Contract Documents may be used in the preparation of shop drawings, as well as the fee that the Architect will be paid, if any and in the Architect's sole discretion, by the Contractor for such use of copyrighted documents.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement. Notices given pursuant to this Section which are given by the attorney for the Owner shall have the same force and effect as notices given by the Owner.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite

AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Construction Manager and the Architect do not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights.

§ 2.1.3 The Owner, Architect or Construction Manager shall not supervise, direct or have control or authority over, nor be responsible for, the Contractor's means, methods, techniques, sequences or procedures of construction or the safety precautions and programs incident thereto, or for any failure of the Contractor to comply with laws and regulations applicable to the furnishing or performance of the Work. The Owner, Architect and Construction Manager shall not be responsible for the Contractor's failure to perform or furnish the Work in accordance with the Contract Documents.

§ 2.2 Evidence of the Owner's Financial Arrangements – Intentionally Omitted.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 All permits and fees, approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities are the responsibility of the Contractor under the Contract Documents with the exception of the building permit, which the Owner will obtain from the New York State Education Department. The Contractor shall furnish the Construction Manager with original copies of all permits prior to the commencement of the work, and shall prominently display a copy of all permits at a location approved by the Construction Manager.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 The Owner shall retain a construction manager adviser lawfully practicing construction management in the jurisdiction where the Project is located. That person or entity is identified as the Construction Manager in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.4 If the employment of the Construction Manager or Architect terminates, the Owner shall employ a successor construction manager or architect whose status under the Contract Documents shall be that of the Construction Manager or Architect, respectively.

§ 2.3.5 The Owner shall make available for inspection, upon request, field survey or testing information of existing conditions that is known to be available and that is held by the Owner at its offices. Such records and documents are not Contract Documents, and the Owner makes no representation as to their accuracy or completeness. Notwithstanding the foregoing, information furnished by the Owner in the form of surveys, subsurface investigation reports, soil borings, and other material of a similar nature, is for general information only and is not a guarantee of the completeness or accuracy of such information, unless specifically noted otherwise herein. The Contractor shall verify all existing grades, conditions, and dimensions of existing physical conditions and structures and shall report any inconsistencies in writing to the Architect. The Contractor shall establish all lines and levels required to execute the Work and shall bear all costs involved, and shall be responsible for their accuracy and maintenance. The Contractor represents that it is familiar with the Project site and has received all information it needs concerning the conditions of the Project site.

§ 2.3.6 Intentionally omitted.

§ 2.3.7 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor five (5) sets of Contract Drawings, three (3) sets of Project Manuals, and three (3) sets of all Addenda materials for use during construction for their own use and for purposes of making reproductions pursuant to Section 1.5.2. The Owner shall furnish additional sets upon a Contractor's written request. Such additional sets will be provided at the cost of printing, postage and handling. Payment is due upon receipt of the additional documents. Partial sets will not be provided. Subcontractors and other entities desiring copies of Drawings will be provided sets at the cost of printing, postage and handling. For expediency, at the discretion of the Architect, the Contract may be directed to pick up documents at the Project-designated printing facility. This practice will not be permitted without authorization of/and coordination by the Architect.

§ 2.3.7.1 Electronic drawing files, AutoCAD format, may be available, at the discretion of the Architect, for a cost of $25.00 per drawing. Contractors requesting this service will be required to sign a disclaimer. Request for electronic files must be made in writing to the Architects office. This request must include a specific list of drawings required in this format. In response, the architect will verify the drawings requested and will forward the disclaimer for signature. Electronic files will be released upon receipt of payment and a fully executed disclaimer form.

§ 2.3.8 The Owner shall forward all communications to the Contractor through the Construction Manager. Other communication shall be made as set forth in Section 4.2.6.

§ 2.4 Owner's Right to Stop the Work

If the Contractor (1) fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2, or (2) fails to carry out Work in accordance with the Contract Documents as determined by the Owner, Architect or Construction Manager, or (3) fails or refuses to provide a sufficient amount of properly supervised and coordinated labor, materials, or equipment so as to be able to complete the Work within the Contract Time, or (4) fails to remove and discharge (within seven (7) days) any lien filed upon Owner's property by anyone claiming by, through, or under the Contractor, or (5) fails to perform the Work in a safe manner and in compliance with all applicable health and safety requirements and the Contractor's site specific health and safety plan or (6) disregards the instructions of the Architect, Owner or Construction Manager, as determined by the Owner, Architect or Construction Manager, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity. Such order or stoppage by the Owner shall not constitute grounds for termination by the Contractor under Article 14 and shall not be a basis for an extension of the Contract Time under Section 8.3 or Article 15.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents (including but not limited to all applicable health and safety requirements) and fails within a three (3) work day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may after such three (3) work day period, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order or Construction Change Directive shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including the Owner's expenses and compensation for the Construction Manager's and Architect's and their respective consultants' additional services and other expenses made necessary by such default, neglect or failure. Such Change Order or Construction Change Directive shall be deemed to have been executed by the Contractor, whether or not actually signed by the Contractor. Such action by the Owner and amounts charged to the Contractor shall be equally binding upon the Contractor's performance and payment bond surety. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

§ 2.5.1 Where the Contractor's default and/or neglect to carry out its Work in accordance with the Contract Documents threatens the health, safety and/or welfare of the occupants of the Owner's facilities and/or threatens the structural integrity and/or preservation of the Owner's facilities, the Owner may proceed to carry out the Contractor's Work upon twenty-four (24) hours' notice of its intention to do so to the Contractor. In such case an appropriate Change Order or Construction Change Directive shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies and defaults, including the Owner's expenses and compensation for the Architect's and its respective consultants' additional services and other expenses made necessary by such default, neglect or failure.

§ 2.6 Extent of Owner's Rights

§ 2.6.1 The rights stated in this Article 2 and elsewhere in the Contract Documents are cumulative and not in limitation of any rights of the Owner (1) granted in the Contract Documents, (2) at law or (3) in equity.

§ 2.6.2 In no event shall the Owner, Architect or Construction Manager have any responsibility for the Contractor's construction means, methods, techniques, sequences or procedures or for safety precautions and programs in connection with the Work notwithstanding any of the rights and authority granted the Owner in the Contract Documents.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The plural term "Multiple Prime Contractors" when used herein refers to persons or entities who perform construction under contracts with the Owner that are administered by the Construction Manager. The term does not include the Owner's own forces, including persons or entities under separate contracts not administered by the Construction Manager.

§ 3.1.3 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.4 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Construction Manager or Architect in their administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor. The Contractor shall maintain complete inspection records and test date to ensure the quality of the Work is in strict compliance with the requirements of the Contract Documents.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.1.1 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the Contract Documents relative to that portion of the Work, as well as with information furnished by the Owner pursuant to Section 2.3.5, shall take field measurements of any existing conditions related to that portion of the Work, shall observe any conditions at the site affecting it, and shall at once report in writing to the Construction Manager and the Architect errors, inconsistencies or omissions discovered. The Contractor shall not be liable to the Owner, the Construction Manager or the Architect for damage resulting from errors, inconsistencies or omissions in the Contract Documents unless the Contractor knew or reasonably should have known of such error, inconsistency or omission and failed to report it as required by this section to the Construction Manager and the Architect. If the Contractor performs any construction activity knowing it involves, or reasonably should have known it involves, a recognized error, inconsistency or omission in the Contract Documents without such notice to the Construction Manager and the Architect, the Contractor shall assume full responsibility for such performance and shall bear sole responsibility for the costs for correction.

§ 3.2.1.2 The obligations of the Contractor under Section 3.2.1.1 and this Section 3.2.1.2 are for the purpose of facilitating construction by the Contractor and are not for the purpose of imposing an affirmative obligation on the Contractor to discover errors, omissions, or inconsistencies in the design information in the Contract Documents. The Contractor's review of the Contract Documents is made in the Contractor's capacity as a contractor and not as a licensed design professional unless otherwise specifically so provided in the Contract Documents.

§ 3.2.1.3 Failure by the Contractor to promptly report any errors, inconsistencies, or omissions in the Contract Documents discovered by the Contractor, or which the Contractor reasonably should have known or discovered, shall constitute a waiver by the Contractor of any claim that otherwise might result in a change in the Contract Sum or Contract Time.

§ 3.2.1.4 The representations of the Contractor as set forth in these General Conditions shall survive expiration or termination of the Agreement.

§ 3.2.2 The Contractor shall be presumed to have examined the Project site(s) to consider fully all conditions that may have a bearing on the Work and to have accounted for these conditions its proposal. The Contractor is deemed to be a qualified expert in the systems and construction requirements of the Work of its Contract. The Contractor hereby specifically acknowledges and declares that the Contract Documents are full and complete, are sufficient to have enabled it to determine the cost of the Work, and that the Drawings, the Specifications, and all Addenda are sufficient to enable the Contractor to construct the Work outlined therein in accordance with applicable laws, statutes, building codes, and regulations, and otherwise to fulfill all of its obligations under the Contract Documents. The Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents before commencing activities. Errors, inconsistencies or omissions discovered shall be reported to the Construction Manager and the Architect at once. The exactness of grades, elevations, dimensions, or locations given on any Drawings issued by the Architect, or the work installed by other Contractors, is not guaranteed by the Architect, Construction Manager or the Owner. The Contractor shall, therefore, satisfy itself as to the accuracy of all grades, elevations, dimensions, and locations. In all cases of interconnection of its Work with existing or other work, the Contractor shall verify at the site all dimensions relating to such existing or other work. Any errors due to the Contractor's failure to so verify all such grades, elevations, dimensions, or locations shall be promptly rectified by the Contractor without any additional cost to the Owner. Except as to any reported errors, inconsistencies or omissions, and except as to concealed or unknown conditions, by executing the Agreement, the Contractor represents to the Owner, Construction Manager, and the Architect:

.1 The Contract Documents are sufficiently complete and detailed for the Contractor to perform the Work required and to comply with all the requirements of the Contract Documents.

.2 The Work required by the Contract Documents, including, without limitation, all construction details, construction means, methods, procedure and techniques necessary to perform the Work, use of materials, selection of equipment and requirements of product manufacturers are consistent with: (1) good and sound practices within the construction industry; (2) generally prevailing and accepted industry standards applicable to Work; (3) the requirements of any warranties applicable to the Work; and (4) all laws, ordinances, regulations, rules and orders which bear upon the Contractor's performance of the Work.

§ 3.2.3 The Contractor shall perform the Work in accordance with the Contract Documents and submittals approved pursuant to Section 3.12.

§ 3.2.4 The Contractor may submit Requests for Information ("RFI") to the Architect to help facilitate the Contractor's performance of the Work. Prior to submitting each RFI, the Contractor shall first carefully study and compare the Contract Documents, field conditions, other Owner provided information, Contractor-prepared Coordination Drawings, and prior Project correspondence and documentation to determine that the information to be requested is not reasonably obtainable from such sources. The Contractor shall submit each RFI sufficiently in advance of the date by which such information is required in order to allow the Architect sufficient time to permit adequate review and response and to permit Contractor compliance with the latest construction schedule. The Contractor shall reimburse the Owner amounts charged by the Architect for RFI responses that in the opinion of the Architect were available from a careful review of the Contract Documents, field conditions, other Owner provided information, Contractor-prepared Coordination Drawings, and prior Project correspondence and documentation.

§ 3.2.4.1 RFIs are for requests on clarifications or questions on Drawings and Specifications, not Contract terms, scheduling items, or general correspondence, nor, as a means to describe or request approval of alternate construction means, methods or concepts or substitution or materials, systems means and methods. The Contractor shall fill all RFIs out in accordance with the provisions of the Project Manual. Neither the Architect nor the Construction Manager shall fill said forms out on the Contractor's behalf.

§ 3.2.5 If the Contractor, during the progress of the Work, discovers any discrepancies between the Drawings and the Specifications, errors and/or omissions on the Drawings, or any discrepancies between physical conditions of the Work and the Drawings, and has notified the Architect and Construction Manager in writing under Section 3.2.1, no deviations from the Contract Documents shall be performed by the Contractor until it receives approval in writing from the Architect through the Construction Manager. Any Work performed after such discovery without the approval of the Architect shall be at the Contractor's sole risk and expense.

§ 3.2.6 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Construction Manager and the Architect any nonconformity discovered by or made known to the Contractor as a RFI submitted to the Architect.

§ 3.2.7 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or RFIs pursuant to Sections 3.2.1, 3.2.2, 3.2.4, 3.2.5 or 3.2.6, the Contractor shall make a Claim as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.1, 3.2.2, 3.2.4, 3.2.5 or 3.2.6, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or the Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.2.8 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for evaluating and responding to the Contractor's requests for information that are not prepared in accordance with the Contract Documents or where the requested information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.

§ 3.2.9 The Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of Owner. The Contractor shall report to the Construction Manager and Architect whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points by professionally qualified personnel.

§ 3.2.9.1 The Contractor shall be required to establish centerlines, elevations and location of his work when it is required for the benefit of other Contractors needing the information to coordinate location of their work.

§ 3.2.10 Whenever the Drawings show existing or other construction not required as part of the Contract Work, it is understood that it is so shown as a matter of information and that the Owner, while believing such information to be substantially correct, assumes no responsibility thereof. The Contractor shall make itself familiar with all conditions affecting the nature and manner of conducting the Work.

§ 3.2.11 The Architect or Construction Manager may require that the Work be suspended at any time when location and limit marks established by the Contractor are not reasonably adequate to permit checking completed Work or the Work in progress.

§ 3.2.12 Notwithstanding any other provision herein, the Owner, Construction Manager and the Architect assume no responsibility or liability for the physical condition or safety of the Project site or any improvements located on the Project site. The Contractor shall be solely responsible for safety and providing a safe place for the performance of the Work. The Owner assumes no responsibility for any erroneous conclusions or interpretations made by the Contractor based on information made available by the Owner. No adjustments will be made in either the Contract Sum or Contract Time for any failure by the Contractor or any Subcontractor to comply with the requirements of this Section.

§ 3.2.13 Claims for additional compensation or extension of time due to the Contractor's failure to familiarize itself with the conditions at the Project site will not be allowed.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention, and shall complete the Work in a good and workmanlike manner in accordance with the Contract Documents. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work subject to the coordination of the Construction Manager. Where the Drawings or Project Manual make reference to particular construction means, methods, techniques, sequences or procedures or indicate or imply that such are to be used in connection with the Contractor's Work, such reference is intended only to indicate that the Contractor's Work is to produce at least the quality of the work implied by the operations described, but the actual determination as to whether or not the described operations may

be safely or suitably employed in the performance of the Contractor's Work shall be the sole responsibility of the Contractor. All loss, damage, liability, or cost of correcting defective Work arising from the employment of a specific construction means, method, technique, sequence, or procedure shall be borne solely by the Contractor.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors, Suppliers, and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors, Suppliers or Sub-subcontractors, and for any damages, losses, costs and expenses resulting from such acts or omissions, including but not limited to reasonable attorneys' fees.

§ 3.3.3 The Contractor shall be responsible for coordinating the work of its own forces and the work of Subcontractors engaged by it to perform the Work of the Project on its behalf. The Contractor shall supply to its own work forces, and Subcontractors engaged by it to perform portions of its Work, copies of the Drawings and Project Manuals for the work to be performed by such individuals/entities on its behalf. The Contractor shall be responsible to the Owner for the acts or omissions of the Contractor's employees, the Contractor's Subcontractors, the Contractor's material suppliers, their respective agents and employees, and any other persons performing portions of the Work on behalf of the Contractor.

§ 3.3.3.1 The Contractor shall coordinate its operations and cooperate with those of other Contractors performing work on the Project or site thereof to ensure efficient and orderly installation of each part of the Work. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the Work. The Contractor shall remain informed of the progress and the detail work of other Contractors and shall notify the Construction Manager immediately of lack of progress or defective workmanship on the part of other Contractors, where such delay or such defective workmanship will interfere with the Contractor's own operations. Failure of the Contractor to keep informed of the work progressing on the site or to give notice of lack of progress or defective workmanship by others shall be construed as acceptance of the progress of work and coordination with the Contractor's own Work.

§ 3.3.3.2 The Contractor's obligations under the Contract Documents shall include, without limitation, the following:

- **.1** Review of all specified construction and installation procedures with its employees and/or Subcontractors, including, without limitation, those recommended by manufacturers, prior to the commencement of the relevant portion of the Work to be performed.
- **.2** Advising the Construction Manager and the Architect:
  - **.1** if a specified procedure deviates from best construction practice;
  - **.2** if following a procedure will affect any warranties, including the Contractor's general warranty; or
  - **.3** of any objections the Contractor may have to a procedure.
- **.3** Proposing alternative procedures, as appropriate, which procedures shall be covered by the Contractor's warranty as described in Section 3.5 hereof.
- **.4** The Contractor shall be responsible for organizing and conducting pre-installation conferences and must coordinate such conferences with the Architect and the Construction Manager.

§ 3.3.3.3 The Contractor and its Subcontractors working on the Project shall attend a preconstruction conference(s) or meeting(s) as deemed necessary by the Construction Manager to coordinate all Work (e.g., demolition, installation, etc.), and as required by the Project Manual.

§ 3.3.4 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Construction Manager or the Architect in their administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor. The Contractor shall maintain complete inspection records and test date to ensure the quality of the Work is in strict compliance with the requirements of the Contract Documents.

§ 3.3.5 Where equipment lines, piping, ductwork, and/or conduit are shown diagrammatically, the Contractor shall be responsible for the coordination and orderly arrangement of the various lines of piping and conduit included in the Work of its Contract. The Contractor shall coordinate the work of its Subcontractors and prevent all interferences between or among equipment, lines of piping, and architectural features, and avoid any unsightly arrangements in exposed areas. This Section shall not be construed as limiting any obligation of the Contractor under any other provision of the Contract Documents.

§ 3.3.6 The Contractor shall be responsible for inspection of portions of the Project already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.3.7 The Contractor, its employees and Subcontractors, shall be subject to such rules and regulations for the conduct of Work as the Owner may establish, including but not limited to, the Construction Rules and Regulations set forth in Section 3.13.4. The Contractor shall be responsible for the enforcement among its employees and Subcontractors of the Owner's instructions.

§ 3.3.8 The Contractor shall inspect all materials as delivered to the Project site and shall reject any materials that will not conform with the requirements of the Contract Documents when properly installed.

§ 3.3.9 The Contractor shall be responsible for and coordinate any and all inspections required by any governmental authority having jurisdiction over the Project. Failure to obtain any permits, licenses or other approvals because of the failure of the Contractor to conform to this requirement shall not extend the Contract time, and the Contractor shall not be entitled to any increase in the Contract Sum therefore. In addition, any additional costs and expenses of any nature incurred by the Owner as a result of the Contractor's failure to conform to this requirement shall constitute a charge against the Contractor's Contract.

§ 3.3.10 Shutdowns: Such work as connections to existing sewers, plumbing, heating, and electrical systems shall be coordinated at a time agreeable to the Owner, the Architect, and the Construction Manager, and shall be determined and agreed to well in advance of the actual performance of such work so as to interfere as little as possible with the operation and use of the Owner's existing facilities. Shutdowns must be coordinated through the Construction Manager. The continued uninterrupted operation of all facilities of the Owner's buildings is essential. If any existing facilities must be interrupted, the Contractor for the Work shall provide all necessary temporary facilities and connections necessary for maintaining these existing facilities at no increase in the Contract Sum except as otherwise specified. No mechanical, heating, plumbing, sprinkler, or electric service shall be interrupted at any time except as approved in advance by the Owner or when the buildings are not occupied and shall be coordinated with the Owner, as well as the Construction Manager. All communication systems must be maintained without interruption. As much related work as possible shall be performed prior to shutdowns, so as to minimize the period of shut down. All material, equipment, and manpower necessary in the performance of a shutdown shall be on site prior to interruption of service.

§ 3.3.11 The Contractor represents that it is familiar with and shall adhere to the *"Uniform Standards for School Construction and Maintenance Projects"* set forth at 8 *New York Code of Rules and Regulations* §155.5 (8 NYCRR 155).

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor (at applicable prevailing wage rates), materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. The Contractor shall work continuously and expeditiously through completion of the Work. Time is of the essence.

§ 3.4.1.1 A shortage of labor in the industry shall not be accepted as an excuse for not properly manning the Project at each site.

§ 3.4.1.2 The Contractor shall be responsible for the care and protection of all equipment and materials for its Work on the Project, including equipment and material furnished by the Owner.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect, in consultation with the Construction Manager, and in accordance with a resulting Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them, or persons who within the last two weeks (a) having been exposed to someone having been diagnosed with a COVID-19 infection; or (b) having had a persistent cough, shortness of breath, or a

fever of 100.4 or higher. The Owner reserves the right to have any persons removed from the Project upon reasonable objection.

§ 3.4.3.1 In addition to all other safety requirements, the Contractor shall provide suitable and a sufficient number of safety related facilities and personal protective equipment (PPE) at the site related to protection against the spread of COVID-19, including but not limited to handwashing stations, hand sanitizer, gloves, masks, faceshields, and other equipment as the Owner may reasonably request. Notwithstanding the foregoing, nothing herein shall be construed to delegate or relieve the Contractor from having sole and exclusive responsibility for all worksite safety.

§ 3.4.4 All mechanics employed on the Project shall be persons skilled in that work which they are to perform. Work will not be approved if it does not meet the quality of workmanship as called for in the Contract Documents. If this quality of workmanship is not exactly defined herein, it shall be assumed to be the best standards of workmanship for the trade. The Contractor shall check all materials and labor entering into the Work site and shall keep full detailed accounts thereof.

§ 3.4.5 Employees of the Contractor or its Subcontractors whose work is unsatisfactory to the Owner, Construction Manager or Architect, or considered by them to be unskilled or otherwise objectionable, will be immediately dismissed from the Project upon notice from the Construction Manager. Those dismissed employees shall be immediately replaced by the Contractor so as not to delay progress of the Work and at no additional cost to the Owner.

§ 3.4.6 On receipt of the signed Contract, the Contractor will be expected to place firm orders with vendors for needed materials, including Subcontractors and major material suppliers. If deemed necessary to assure delivery of materials at times needed, the Contractor may accept delivery of such materials at any time, and may include the cost of such materials in its next monthly Application for Payment, provided such materials have actually been delivered to Contractor and properly stored by it with approval or under direction of the Architect and the Construction Manager either at the Project site or in an approved storage shed or warehouse, as provided elsewhere in these General Conditions.

§ 3.4.6.1 To the fullest extent possible, the Contractor shall provide products of the same kind, from a single source. When two or more items of same material or equipment are required (pumps, valves, air conditioning units, etc.) they shall be of the same manufacturer. Product manufacturer uniformity does not apply to raw materials, bulk materials, pipe, tube, fittings (except flanged and grooved types), sheet metal, wire, steel bar stock, welding rods, solder, fasteners, motors for dissimilar equipment units, and similar items used in the work, except as otherwise indicated. The Contractor shall provide products which are compatible within systems and other connected items. If the Contractor is given option of selecting between two or more products for use on the Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

§ 3.4.6.2 The Contractor is responsible for providing products and construction methods compatible with products and construction methods of other Contractors. If a dispute arises between the Contractor and other Contractors over concurrently selectable but incompatible products, the Architect will determine which products shall be used.

§ 3.4.6.3 With respect to sitework materials, all products submitted for use and incorporated into the Project shall be on the Approved List of Materials and Equipment published by the NYSDOT Materials Bureau, most recent edition.

§ 3.4.6.4 When required, off-site storage shall be the responsibility of the Contractor. If materials are stored off site, the Contractor shall furnish proof of title by Owner and provide a certificate of insurance demonstrating adequate insurance coverage.

§ 3.4.6.5 The Contractor shall deliver all materials at such times as will ensure speedy and uninterrupted progress of the Work.

§ 3.4.6.6 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them The Owner reserves the right to object to the Contractor's use of persons who appear unfit or not skilled in the tasks assigned to them. Should any disorderly, incompetent, unfit, unskilled or objectionable person be hired or employed by the Contractor or its Subcontractors, upon or about the premises of the Owner, for any purpose or in any capacity, they shall, upon request of the Owner, be removed from the Project and not again be assigned thereon without the written permission of the Owner.

§ 3.4.7 The Contractor warrants that it has good title to all materials used by it in, on or in connection with the Work. No materials or supplies shall be purchased by the Contractor or any of its Subcontractors that are subject to any chattel mortgage, conditional sale, or other agreement by which an interest is retained by the seller.

§ 3.4.8 The Contractor shall only employ labor on the Project or in connection with its Work capable of working harmoniously with all trades, crafts and other individuals associated with the capital improvement work to be performed. The Contractor shall make every reasonable effort to avoid labor disputes and to insulate the Owner, Architect and Construction Manager from the effects of labor disputes should any arise. There shall be no strikes, picketing, work stoppages, slowdowns, or other disruptive activity at the Project for any reason by anyone employed or engaged by the Contractor to perform its portion of the Work. There shall be no lockout at the Project by the Contractor. The Contractor shall be responsible for providing the manpower required to proceed with the Work under any circumstance. For the purposes of this Section, every reasonable effort shall include, but not necessarily be limited to:

- **.1** make all necessary arrangements to reconcile, without delay, damage or cost to the Owner and without recourse to the Architect, the Construction Manager or the Owner, any conflict between its Agreement with the Owner and any agreements or regulations of any kind at any time in force among members or councils which regulate or distinguish what activities shall not be included in the work of any particular trade;
- **.2** requiring employees, Subcontractors, suppliers and others to use reserve gates which shall be established for the Project;
- **.3** rearranging work schedules for the Contractor's Work or the work of its Subcontractors; and
- **.4** including in the Contractor's agreements with its Subcontractors the right to fully implement all provisions of this Section.

§ 3.4.8.5 In case the progress of the Work is effected by any undue delay in furnishing or installing any items or materials or equipment required pursuant to the Contract because of a conflict involving any such labor agreement or regulation, the Owner may require that other material or equipment of equal kind and quality be provided pursuant to a Change Order or Construction Change Directive but in no case shall the amount of such change be charged by the Contractor to the Owner as an additional cost to perform the Work.

§ 3.4.8.5.1 No extension of the Contract Time shall be granted for delays caused by labor or material disputes.

§ 3.4.8.5.2 Should it become necessary to create a separate entrance for a Contractor involved in a dispute, all costs associated with creating that entrance shall be borne by the Contractor involved in the dispute. Such costs shall include, but not limited to signage, fencing, temporary roads and security personnel as deemed necessary by the Owner for the safety of the occupants of the site.

§ 3.4.8.6 The Contractor shall ensure that its Work continues uninterrupted during the pendency of a labor dispute.

§ 3.4.8.7 The Contractor shall be liable to the Owner for all damages suffered by the Owner occurring as a result of work stoppages, slowdowns, disputes or strikes arising from the labor practices of the Contractor or its Subcontractors, Suppliers or Sub-subcontractors.

§ 3.4.9 The Contractor and its Subcontractors employed upon the Work shall abide by and conform with all labor laws and to all other laws, ordinances, and legal requirements now or hereafter applicable to the Work and the construction area.

§ 3.4.10 The Contractor and its Subcontractors shall be responsible for protection of the Work, the work of Separate or other Contractors, and existing construction, both on and off the site, and in the event of damage, shall restore the same to the original condition at no additional cost to the Owner.

§ 3.4.11 If the Work is to be performed by trade unions, the Contractor shall, with the consent of the Owner and the Architect, which shall not be unreasonably withheld, make all necessary arrangements to reconcile, without delay, damage, or cost to the Owner, any conflict between the Contract Documents and any agreements or regulations of any kind, at any time in force among members or councils that regulate or distinguish what activities are included in the work of any particular trade.

§ 3.4.12 No new asbestos containing building materials shall be used in construction. No materials containing asbestos in any form shall be used in, on, or around the Owner's buildings**.**

§ 3.4.13 All Work shall be executed in complete accordance with the manufacturer's most recent recommendations unless otherwise specified or permitted by the Architect. A sufficient force of competent workmen, foremen, and superintendents shall be employed at all times to permit the Work to be pursued with diligence until completion and within the Contract Time.

§ 3.4.14 The Contractor shall provide the labor necessary to install his work within the terms of this Contract and the Contract Time.

§ 3.4.15 The Contractor shall be responsible for the care and protection of all equipment and materials for the Contractor's Work including equipment and material furnished by the Owner and installed by the Contractor.

§ 3.4.16 All articles, materials and equipment shall be applied, installed, connected, used, cleaned, and conditioned in accord with directions of manufacturer unless otherwise specified herein.

§ 3.4.17 Equivalents and Substitutions

§ 3.4.17.1 Equivalents. In the Specifications, one or more kinds, types, brands, or manufacturers or materials are regarded as the required standard of quality and are presumed to be equal. The Contractor may select one of these items or, if the Contractor desires to use any kind type, brand, or manufacturer or material other than those named in the Specifications, it shall indicate in writing, and prior to award of the Contract, what kind, type, brand or manufacturer is included in the base bid for the specified item. The Contractor shall follow the submission requirements for equivalents as provided in the Project Manual. Any proposed equivalent shall not be purchased or installed by the Contractor without the Architect's review process having been completed and the product accepted by written notification.

§ 3.4.17.2 Substitutions. After the Contract has been executed, the Owner, Construction Manager and Architect will consider a formal request for the substitution of products in place of those specified only under conditions set forth in the Specifications.

§ 3.4.17.3 By making said requests in conformance with procedures established herein and elsewhere in the Project Manual, the Contractor: (1) represents that it has personally investigated the proposed substitute product and has determined that it is equal to or superior in all respects to that specified; (2) represents that the warranty for the substitution will be the same, or greater than, that applicable to the specified product; (3) certifies that the cost data is complete and includes all related costs under the Contract, including professional services necessary and/or required for the Architect or its consultants to implement said substitution and waives any and all claims for additional costs related to the substitution that subsequently become apparent; (4) represents that it will coordinate the installation of the accepted substitute, making all such changes to the Drawings effected by the change, including but not limited to the electrical, plumbing, site work and heating and ventilating Specifications as may be required for the Work to be complete in all respects; and (5) represents that it will reimburse the Owner for all additional costs billed by the Architect or its consultants for the review of the substitution request(s), any redesign of the Work of this Contractor or associated contractors, additional site visits related to the substitution request and for the work to prepare Change Orders or Construction Change Directives.

§ 3.4.18 The Contractor shall prepare and maintain daily inspection records to document the progress of the Work on a daily basis. Such daily records shall include a daily accounting of all labor and all equipment on the site for the Contractor and all Subcontractors, at any tier. Such daily records shall make a clear distinction between Work being performed under Change Order, base scope work, and/or disputed work.

§ 3.4.18.1 In the event that any labor or equipment is idled, solely as a result of the Owner's actions or inactions, the daily records shall record which laborers and equipment were idled and for how long. In the event that specific work activities were stopped, solely as a result of the Owner's actions or inactions, and labor and equipment was reassigned to perform work on other activities, the daily records shall make a clear record of which activities were stopped and where labor and equipment were redirected.

§ 3.4.18.2 All such daily records shall be copied and provided to the Owner at the end of every week.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner, Construction Manager and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements, including substitutions not properly approved and authorized, shall be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. All warranties and guarantees specifically called for by the Contract Documents shall expressly run to the benefit of the Owner. If required by the Architect, the Contractor shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with instructions of the applicable supplier, except as otherwise provided in the Contract Documents. The Contractor shall perform the Work in strict accordance with the Contract Documents and best industry practices. The Contractor, at its expense, shall upon demand by the Owner, Construction Manager or Architect remove and replace materials not meeting specifications or materials failing to perform as represented or warranted by the manufacturer, regardless of whether incorporated into the Work. The Contractor shall promptly replace or correct any Work or materials that the Owner, Construction Manager or Architect rejects as failing to conform to the requirements of the Contract Documents. The foregoing warranty obligations shall survive completion or termination of the Contract, are not limited by the provisions of Article 12, and are in addition to and not in limitation of any other warranty, right or remedy set forth in the Contract Documents or otherwise prescribed by law.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4. The Contractor shall assign to the Owner at the time of final completion of the Work any and all manufacturer's warranties relating to materials and labor used in the Work and further agrees to perform the Work in such manner so as to preserve any and all such manufacturer's warranties. The Contractor shall fully cooperate with the Owner in the event the Owner pursues remedies under any warranties assigned to the Owner. The Contractor acknowledges that its obligations to the Owner under Section 3.5 are joint and several with its Subcontractors, suppliers, and material or equipment manufacturers of all materials and equipment supplied on account of the Work.

§ 3.5.3 No warranties or guarantees by the Contractor will deprive the Owner of any cause of action, right, or remedy otherwise available for breach of any of the provisions of the Contract Documents. Neither final payment nor provision in the Contract Documents nor partial or entire occupancy of premises by Owner shall constitute acceptance of Work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibilities for faulty or defective materials or workmanship.

§ 3.5.3.1 The Contractor shall deliver to the Owner upon completion of all work under its Contract, its written guarantee made out to the Owner in a form acceptable to the Owner, guaranteeing (and it does so guarantee) all of the Work under the Contract to be free from faulty materials, and free from improper workmanship, and guarantees against injury from proper and usual wear and aging.

§ 3.5.4 All required maintenance shall be the Contractor's responsibility until the Owner has accepted the Project as complete, all required maintenance and user's manuals have been turned over to the Owner, and the Owner's designated personnel have been instructed in the maintenance and operation of all applicable materials. This maintenance shall include a complete turnover procedure at the time of completion, including complete cleaning, testing and adjustment. The Contractor shall keep records of all such maintenance performed as required by this Section, including work performed and times and dates on which it was performed. These records shall be turned over to the Owner at closeout.

§ 3.5.5 The Contractor shall in case of work performed by its Subcontractors, and where guarantees are required, secure warranties from Subcontractors and deliver copies of same to the Construction Manager countersigned by the Contractor.

§ 3.6 Taxes

Except as otherwise specified, the Contractor shall pay sales, consumer, use and similar taxes for the Work or portions thereof provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.6.1 The Owner is exempt from payment of federal, state, and local sales and compensation use taxes on all supplies and materials incorporated into and becoming an integral component part of the structures, buildings, or real property pursuant to this Contract. Such taxes are therefore not to be included in the Contractor's bid or the Contract Sum. The Owner shall deliver to the Contractor the appropriate exemption certificate required to be supplied by the Owner, and the Contractor and its Subcontractors and materialmen shall be solely responsible for obtaining and delivering any and all exemption or other certificates and for furnishing a Contractor Exempt Purchase Certificate or other appropriate certificates to all persons, firms, or corporations from whom they purchase supplies, materials, and equipment for the performance of the Work.

§ 3.6.1.1 The Contractor's attention is called to fact that materials not actually incorporated into Work will not be exempt from payment of sales or compensating use taxes, and the Contractor and its Subcontractor shall be responsible for and shall pay any and all applicable taxes. This will apply to such things as:

.1 construction machinery and equipment including rentals or repair parts;
.2 The Contractor's office supplies;
.3 The Contractor's supplies, tools and miscellaneous equipment including forms, materials, and scaffolding (whether purchased or rented);
.4 temporary heat;
.5 telephone or electric services; and
.6 any other items purchased or rented by the Contractor for the Contractor's use in performing its Work and not incorporated into realty.

§ 3.6.2 The Contractor accepts full and exclusive liability for payment of any and all contributions, assessments or taxes for unemployment insurance or old age insurance, or annuities now or hereafter imposed by the government of the United States, or by the government of any city, county or state of United States, which are measured by salaries or other remuneration paid to persons employed by the Contractor or any Subcontractor for Work performed under this Contract.

§ 3.7 Permits, Fees, Notices, and Compliance with Laws

§ 3.7.1 The Owner shall secure a building permit from the State Education Department as required for the Project. The Contractor shall secure and pay for all other permits and governmental fees, licenses, and inspections necessary for proper execution of and completion of the Contract that are legally required when bids are received. The Contractor shall procure and obtain all bonds required of the Owner or the Contractor by the municipality in which the Project is located or by any other public or private body with jurisdiction over the Project. In connection with such bonds, the Contractor shall prepare all applications, supply all necessary back-up material and furnish the surety with any required personal undertakings.

§ 3.7.1.1 The Contractor shall, as soon as practicable, furnish the Owner and Architect with copies or certificates of all permits, fees, licenses, and inspections necessary for the proper execution and completion of the Work, including, without limitation, all applicable building permits other than those required of the Owner under the Contract Documents. All inspection fees and other costs of such permits and licenses required to be obtained by the Contractor as may be imposed by any municipal or other entity shall be paid by the Contractor and shall not serve as the basis for any increase in the Contract Sum.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work. If the Contractor fails to give such notices, it shall be liable for and shall indemnify and hold harmless (a) the Owner, its consultants, employees, officers and agents and (b) the Architect and its consultants, employees, officers and agents against any resulting fines, penalties, judgments, or damages, including reasonable attorney's fees, imposed on or incurred by the parties indemnified hereunder.

§ 3.7.2.1 In accordance with New York State Labor Law Article 8, Section 220, subd. 3-a(a), the Contractor shall submit to the Owner within 30 days after issuance of Contractor's first payroll, and every 30 days thereafter, a transcript of the original payroll record, subscribed and affirmed as true under the penalties of perjury.

§ 3.7.2.2 The Contractor shall comply with all applicable New York State Department of Labor requirements, including the provision that every worker employed in performance of a public work contract shall be certified as having completed an OSHA 10-hour safety training course. The Contractor and its Subcontractors shall be solely responsible for compliance with this requirement with respect to their employees. The Contractor's or its

Subcontractor's failure to comply with this requirement shall not transfer or in any way impose the responsibility for worker safety upon the Owner, Construction Manager or the Architect.

§ 3.7.3 If the Contractor performs Work that it knows or should know (in the exercise of good construction practice) is contrary applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear all costs attributable to the correction thereof or related thereto, including reimbursement to the Owner for any additional services required of the Architect and Construction Manager, as well as all fines and penalties, if any.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall give prompt written notice to the Owner, Construction Manager, and the Architect of such conditions before they are disturbed or affected work is performed and in no event later than five (5) business days after first observance of the conditions; provided that, in the case of a condition at the site that involves hazardous or toxic substances, as those terms are defined by OSHA or AHERA, notice to the Owner, Construction Manager and Architect shall be given immediately upon discovery of such hazardous or toxic substance. The Architect or Construction Manager will promptly investigate such conditions and, if the Architect, in consultation with the Construction Manager, determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect, in consultation with the Construction Manager, determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner, Construction Manager, and Contractor in writing, stating the reasons. If the Contractor disputes the Architect's determination or recommendation, it may proceed as provided in Article 15. No adjustment in the Contract Time or Contract Sum will be permitted, however, in connection with a concealed or unknown condition that does not differ materially from those conditions disclosed or that reasonably should have been disclosed by the Contractor's (1) prior inspections, tests, and reviews, or (2) inspections, tests, and reviews the Contractor had the opportunity to make or should have performed in connection with the Project.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner, Construction Manager, and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents:

- **.1** allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- **.2** Lump Sum Allowances, Unit Cost Allowances and Quantity Allowances: the Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances;
- **.3** Contingency Allowances: the Contractor's costs, including all such subcontractor costs, for receiving and handling at Project site, labor, installation, and similar costs related to products and materials under allowance shall be included as part of the allowance. The Contractor, and its Subcontractors, overhead and profit related to the allowance shall be included as part of the Contract Sum and not part of the allowance; and

.4 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2. The Contractor is not entitled to overhead and profit on unexpended allowance amounts or any portions thereof.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness. Allowances shall be used only upon written authorization of the Architect and Owner.

§ 3.9 Superintendent

§ 3.9.1 Prior to starting the Work, the Contractor shall designate the Project Manager, a full-time Superintendent and other key individuals who shall be assigned to the Project through and including Final Completion. Such designations shall be in writing and provided to the Construction Manager, Architect and Owner and shall include the qualifications of such individuals. The Superintendent shall be in attendance at the Project site throughout the Work, remain on the Project site not less than eight hours per day, five days per week, until termination of the Contract, unless the job is suspended, Work is stopped by the Owner, or no Work is scheduled. The Superintendent shall be approved by the Owner in its sole discretion. Said representatives shall be qualified in the type of work to be undertaken and shall not be changed during the course of construction without the prior written consent of the Owner. Should a representative leave the Contractor's employ, the Contractor shall promptly designate a new representative. The Owner shall have the right, at any time and in its sole discretion, to direct a change in the Contractor's representatives if their performance is unsatisfactory. In the event of such a demand, the Contractor shall within seven (7) days after notification thereof, replace said individual(s) with an individual(s) satisfactory to the Owner, in the Owner's sole discretion. If said replacement is disapproved, the Contractor may, at the Owner's option, be terminated for cause. The Superintendent shall represent the Contractor, and communications given to the Superintendent shall be as binding as if given to the Contractor. The Owner shall have no obligation to direct or monitor the Contractor's employees. All references herein to the Superintendent shall be taken to mean the Contractor's superintending staff. Each Subcontractor shall designate the Project Manager, Superintendent and other key individuals who shall be assigned to the Project. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case. The Contractor's Superintendent shall attend all Project meetings, regardless of whether held prior to or following Substantial Completion of the Work.

§ 3.9.2 The Contractor shall provide, or otherwise see that, the Project Manager, or Superintendents or responsible workers of the Contractor and its major Subcontractors are equipped with cellular phones and radios. The Contractor shall provide the Owner, the Construction Manager, and the Architect with the number for each phone and worker.

§ 3.9.3 The Contractor's supervisory personnel, including Superintendents and their assistants, shall be versed in the English language. In the event the Contractor's supervisory personnel, Superintendents and their assistants are not versed in the English language, the Contractor shall employ the services of a full-time on-site interpreter to facilitate communications with such supervisory personnel.

§3.9.4 The Contractor shall not reduce or terminate supervision of the Work, nor change the Superintendent without the prior written approval of the Owner.

§3.9.5 If, for any reason, the Contractor takes an action resulting in any of the changes noted in Subsection 3.9.4, the Owner may take remedial action to ensure continued progress of the Work, including the hiring of suitable supervisory personnel, and charge the Contractor all costs associated with these remedial actions including the costs of legal and additional construction management and architectural services.

§ 3.9.6 The Contractor recognizes and acknowledges that job meetings will be held at the job site weekly as set forth in the Project Manual, unless otherwise designated by the Owner, Construction Manager or the Architect. The Contractor shall have responsible representation at the mandatory weekly job progress meetings held at the Construction Manager's job office. These progress meetings will be held to arrange for satisfactory coordination of all trades on the Project so as not to impede job progress. If the Contractor or its Subcontractors fail to attend job meetings, the Contractor shall be responsible for delays and expenses incurred due to coordination difficulty.

§ 3.9.7 The Contractor shall provide copies of its daily construction reports to the Construction Manager's Field Superintendent. These reports shall be submitted no later than 10:00 am the following workday. The daily reports shall provide detailed information concerning the Contractor's activities and operations, including Work activities on site and manpower.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly, but in no event later than 14 days, after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information and the Construction Manager's approval a Contractor's construction schedule for the Work in electronic format with predecessor logic. The construction schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The Contractor's construction schedule shall provide for the orderly progression of the Work to completion, and shall not exceed time limits current under the Contract Documents. The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict with, and as to cause no delay in, the work or activities of other Multiple Prime Contractors or the construction or operations of the Owner's own forces. The Contractor's construction schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project but the Contract Time and any applicable Milestone Date shall not be changed except by fully executed Change Order.

§ 3.10.1.1 Time is of the essence for this Project. The Work shall be performed continuously and without interruption, so that all Work can be completed in the time set forth in the Contract Documents.

§ 3.10.1.2 The sequence of the Work shall be scheduled with the Owner so as to minimize interference with the Owner's use of existing structures, and the Owner's approval shall be obtained prior to starting of the Work.

§ 3.10.1.3 The Contractor's construction schedule shall be in a detailed precedence style critical path management ("CPM") or Primavera-type format satisfactory to the Owner and Construction Manager that shall also: (i) provide a graphic representation of all activities and events that will occur during the performance of the Work; (ii) identify each phase of construction and occupancy; and (iii) set forth dates that are critical in ensuring the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents. Submission of an accepted construction schedule shall be a prerequisite to initial payment.

§ 3.10.2 The Construction Manager shall prepare, publish, and, from time-to-time, revise a master integrated Project Schedule based upon the construction schedules submitted by the Contractor and other Contractors. Failure by the Contractor to furnish any required schedule or schedule revision in a timely manner shall entitle the Construction Manager to prepare a schedule for the Contractor's Work, to which the Contractor shall be bound.

§ 3.10.2.1 The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict, delay in or interference with the Work of other Contractors or the construction or operations of the Owner's own forces. The Owner shall have the right, without penalty, to direct the Contractor to delay, postpone or reschedule any portion of the Work that may interfere with or disrupt the operations of the Owner.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Construction Manager so that all Work can be completed in the time set forth in the Contract Documents. The accepted construction schedule shall be dated to reflect actual conditions (sometimes referred to as progress reports) as set forth in Section 3.10.1 or if requested by the Owner, Construction Manager or Architect. In the event any progress report indicates any delays, the Contractor shall propose an affirmative plan to correct the delay, including overtime and/or additional labor, if necessary. In no event shall any progress report constitute an adjustment in the Contract Time, or any milestone date, or the Contract Sum unless any such adjustment is agreed to by the Owner and authorized pursuant to a Change Order.

§ 3.10.4 In the event the Owner determines that the performance of the Work has not progressed to the level of completion required of the Contract Documents or that the Contractor has failed to maintain its construction schedule or the Project Schedule, the Owner shall have the right to order the Contractor to take corrective measures necessary to expedite the progress of construction including without limitations, additional shifts, overtime, additional manpower or equipment as well as other similar measures (hereinafter referred to collectively as "extraordinary measures"). Such extraordinary measures shall continue until the progress of Work complies with milestone and critical path dates set forth in the Contract Documents and the Project Schedule. The Contractor shall not be entitled to an adjustment in Contract Sum or Contract Time in connection with extraordinary measures required by the Owner.

§ 3.10.5 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter update it as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Construction Manager's and Architect's approval. The Architect and Construction Manager's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Construction Manager and Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.6 The Contractor shall participate with other Contractors, the Construction Manager and Owner in reviewing and coordinating all schedules for incorporation into the Project Schedule that is prepared by the Construction Manager. The Contractor shall revise the construction schedule and submittal schedule as deemed necessary by the Construction Manager to conform to the Project Schedule and the Contract Documents.

§ 3.10.7 The Contractor shall perform the Work in general accordance with the most recent construction schedules submitted to the Owner, Construction Manager and Architect and incorporated into the approved Project Schedule. The Contractor shall monitor the progress of the Work for conformance with the requirements of its construction schedule and Project Schedule and shall promptly advise the Owner of any delays or potential delays affecting the critical path.

§ 3.10.8 If the Contractor fails to maintain the approved construction schedule or Project Schedule and meet all critical path dates for the Work, the Owner may request a recovery plan from the Contractor and reserves the right to withhold payment until such time as the Contractor submits a recovery plan. The recovery plan must show how the Work may plausibly be brought on schedule, including, as necessary, acceleration of the Work by means of overtime, additional crews, additional shifts, additional equipment or re-sequencing of the Work to achieve completion of the remaining critical path dates in the construction schedule or Project Schedule. The Contractor shall submit as part of its recovery plan: (i) a "resource loaded" schedule showing the Contractor's plan to deploy manpower per trade, per work area, per day, together with essential materials and equipment, and other resources necessary to timely accomplish the Work; and (ii) a two-week "look ahead" schedule identifying tasks to be accomplished within the coming two week period, the work areas and categories of work, and necessary manpower resources, together with other data necessary to demonstrate to the Owner the viability of the Contractor's recovery plan ("2 Week Plans"). The Contractor shall continue to submit 2 Week Plans until either the Contractor demonstrates that the Project Schedule has recovered from the unexcused delay, or the Owner notifies the Contractor in writing that further 2 Week Plans are no longer required. The cost of preparing and performing the recovery plan shall be borne solely by the Contractor. No approval or consent by the Owner of any plan for resequencing or acceleration of the Work submitted by Contractor shall constitute a waiver by Owner of any damages or losses which the Owner may suffer by reason of such resequencing or the failure of the Contractor to meet the Substantial Completion Date or the final completion date.

§ 3.10.9 The Contractor specifically represents and warrants to the Owner that that the Contract Sum and the Contract Time contemplate compliance with all current, and reasonably foreseeable future, federal, state and local "Stay at Home," "Social Distancing" and related orders, regulations and guidance related to limiting the spread of COVID-19 disease (the "COVID Requirements"). Accordingly, the Contractor hereby waives any claim for an increase in the Contract Sum or an extension of the Contract Time on account of the COVID Requirements. The Contractor shall promptly notify the Owner of any COVID Requirements that would impact the Project.

§ 3.10.10 Due to the ongoing COVID-19 pandemic and the resulting uncertainty with regard to, among other things, (a) what restrictions, if any, will be applicable to construction activities due to federal, state or local orders, laws, regulations or rules related to the COVID-19 pandemic (including, without limitation, social distancing, PPE, cleaning and disinfection requirements) and (b) the duration of any restrictions imposed on construction activities, the Owner may modify the schedule set forth in the Contract Documents and the Project Schedule. Similarly, restrictions, if any, that will be or are applicable to construction activities due to federal, state or local orders, laws, regulations or rules related to the COVID-19 pandemic (including, without limitation, social distancing, PPE, cleaning and disinfection requirements) may cause the Owner to have the Work or the Project commence later than the date specified in the Contract Documents. The Contractor acknowledges and agrees that there should be no additional compensation paid for schedule modifications caused directly or indirectly by the COVID-19 pandemic. The Contractor further acknowledges and agrees that its sole remedy for any schedule modifications or delays caused directly or indirectly by the COVID-19 pandemic shall be an extension of the Contract Time, if warranted. The Contractor further acknowledges and agrees that it shall have on file and provide a copy to the Owner of its written COVID-19 business reopening plan, and it shall comply in all respects with such plan for the duration of the

Project. The Contractor, not the Owner, shall be responsible for compliance with its COVID-19 business reopening plan and all safety requirements associated with COVID-19 protections for workers and the general public.

§ 3.11 Documents and Samples at the Site

§ 3.11.1 The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These documents shall be available to the Architect and delivered to the Construction Manager for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.11.2 The Contractor shall maintain at the site, and shall make available to the Owner, Construction Manager and Architect, one record copy of the Drawings (the "Record Drawings") in good order. The Record Drawings shall be prepared and updated during the prosecution of the Contractor's Work. The prints for Record Drawing use will be a set of black line prints provided by the Architect to the Contractor at the start of construction. The Contractor shall maintain said set in good condition and shall use colored pencils to mark up said set with "record information" in a legible manner to show: (i) deviations from the Drawings made during construction; (ii) details in the Work not previously shown; (iii) changes to existing conditions or existing conditions found to differ from those shown on any existing drawings; (iv) the actual installed position of equipment, piping, conduits, light switches, electric fixtures, circuiting, ducts, dampers, access panels, control valves, drains, openings, and stub-outs, etc.; (v) architectural and structural changes in the design; and (vi) such other information as either the Owner or Architect may reasonably request. At the completion of the work and before a final Certificate of Payment is issued, the Contractor shall prepare a final set of reproducible "As-Built" mylar drawings with the Contractor's title block bearing the Contractor's name, date and signature attesting that the Work was installed as shown. Such drawings shall be titled "AS-BUILT" in the lower righthand corner. Submit two paper prints to the Architect for initial review. After the prints are reviewed and returned to the Contractor, the Contractor shall deliver to the Architect the colored Record drawing and the As-Built reproducible drawings. Final payment and any retainage shall not be due and owing to Contractor until the Record and As-Built drawings receive the approval from the Architect and the Owner (and all other closeout requirements are met). The Architect shall be the sole judge of the acceptability of any and all drawings.

§ 3.11.3 The Contractor shall maintain all approved permit drawings in a manner so as to make them accessible to government inspectors and other authorized agencies having jurisdiction over the Project. All approved drawings shall be wrapped, marked and delivered to the Owner within 60 days of final completion of the Contractor's Work.

§ 3.12 Shop Drawings, Product Data, and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work. Each submittal shall bear written confirmation that the Contractor has satisfied its obligations under the Contract Documents with respect to the Contractor's review and approval of the submittal. The Contractor shall comply with the provisions and procedures for Shop Drawings, Product Data, and Samples set forth in the Project Manual. The Shop Drawings shall include fabrication, erection, layout, and setting drawings and schedules, wiring and piping diagrams; and any other information required for proper approval of or installation of all parts of the Work specified. If any modifications are required to a standard item, such modifications shall be clearly shown or noted at the time of submission of Shop Drawings.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, operating and maintenance procedures, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to (1) demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents, and (2) show a system or product's ability to meet applicable criteria for those portions of the Work for which the Contract Documents require submittals. Review by the Architect and Construction Manager is subject to the limitations of Sections 4.2.10 through 4.2.12. Informational submittals upon which the Construction Manager and Architect are not expected to take responsive action may be so identified in the

Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Construction Manager or Architect without action.

§ 3.12.4.1 Shop drawings and product submittals for all site improvement, architectural, structural, mechanical, electrical and signal work shall be submitted to the Architect for its review.

§ 3.12.4.2 The Contractor represents and warrants that all Shop Drawings shall be prepared by a person or entity possessing expertise and experience in the trade for which the Shop Drawing has been prepared and, if required by the Contract Documents or law, by a licensed professional engineer.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, with copies to the Construction Manager, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the Project submittal schedule approved by the Construction Manager and Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of other Contractors, Separate Contractors, or the Owner's own forces. The Contractor shall cooperate with the Construction Manager in the coordination of the Contractor's Shop Drawings, Product Data, Samples, and similar submittals with related documents submitted by other Contractors. All submissions shall be in accordance with Section 01300 Submissions.

§ 3.12.5.1 No extension of time will be granted to the Contractor because of failure to have Shop Drawings, Product Data, and Samples submitted in ample time to allow for review by the Architect or its consultants.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner, Construction Manager, and Architect, that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. The Contractor shall be responsible for verification of field dimensions and conditions and shall furnish such information to the Architect when requested. Before the Contractor proceeds with the Work in question, the Contractor should field verify all dimensions. In case of doubt about dimensions, the Contractor should notify the Architect immediately for instructions.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been reviewed and approved by the Architect. Resubmission of rejected documents shall be performed within 10 calendar days, or sooner if required by the progress of construction as determined by the Architect or Construction Manager. No claim for delay or cost shall be accepted as a result of rejected submittal documents. If the Architect is required to review the Contractor's submittal more than twice, the Contractor shall bear the cost and expense associated with such additional review as set forth in the Project Manual.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Construction Manager and Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Construction Manager and Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions. Resubmission of rejected documents shall be performed within 10 calendar days or sooner if required by the progress of construction as determined by the Architect or Construction Manager. No claim for delay or cost shall be accepted as a result of rejected documents.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's

responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Construction Manager and Architect at the time and in the form specified by the Architect.

§ 3.12.11 The Contractor shall approve all Shop Drawings, Product Data, and Samples prior to submitting them to the Architect. Samples shall be properly labeled, giving the following information as applicable:

- **.1** Project name and location.
- **.2** Name, finish, and composition of material.
- **.3** Location where material is to be used.
- **.4** When approved, samples shall be so indicated.
- **.5** Labels shall be large enough for approval stamp.

§ 3.12.12 The Contractor is required to provide all submittals for the Architect's review; all submittals to be provided to the Architect by the submittal deadlines noted in the Contract Documents.

§ 3.12.13 The Architect's review of Contractor's submittals will be limited to examination of an initial submittal and one resubmittal. The Owner is entitled to obtain reimbursement from the Contractor for amounts paid to the Architect for evaluation of additional resubmittals, and for evaluation of submittals for which the initial submission is received after the submittal deadlines noted in the Contract Documents.

§ 3.13 Use of Site

§ 3.13.1 The Owner shall not be liable to the Contractor, Subcontractors of any tier, suppliers, their employees or anyone else with respect to the condition of the Project site. The Owner shall have the right to refuse admittance to the site to any agent or employee of the Contractor, its Subcontractors of any tier, or its suppliers whose presence the Owner reasonably deems hostile to the Owner's interests. The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment. The use of the Owner's assets and property are extremely limited. The Contractor shall fully comprehend the intent of the Contract Documents pertaining to site and building limitations including, without limitation, Division 1 Specifications sections, the phased construction plan, and the site safety and logistics plan(s).

§ 3.13.2 The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Construction Manager before using any portion of the site.

§ 3.13.3 The Contractor shall perform and shall ensure that all Subcontractors and suppliers perform all Work in a manner that permits reasonable access to the Project site and to all adjacent premises. The Contractor shall not, and shall not permit any Subcontractor or supplier to, conduct the Work in a manner that disturbs or that could be reasonably anticipated to disturb operations and persons located in or on portions of the site not affected by the Work. The occupied portion of any of the Owner's buildings shall always comply with the minimum requirements necessary to maintain a certificate of occupancy.

§ 3.13.4 Construction Rules and Regulations. The following rules and regulations shall be observed and enforced by the Contractor and its Subcontractors and suppliers in connection with all phases of the Work:

.1 In accordance with New York State law, smoking is prohibited anywhere on school property. Violators will be subject to arrest and/or fine of $1,000 per occurrence. No alcoholic beverages or controlled substances are permitted on school property, and persons under the influence of alcoholic beverages or controlled substances may not enter in or remain on school property.

.2 In accordance with the United States Gun-Free School Zones Act of 1994, no firearms are permitted within 1,000 feet of any school building, with certain limited exceptions as set forth therein. In addition to such limitations, no firearms shall be brought on school property without the Owner's express prior consent.

.3 Appropriate protective gear (hard hats, safety shoes, goggles, etc.) are to be worn as required by OSHA standards, the New York State Department of Labor, and prudent practice. Shirts are to be worn at all times. No short pants are permitted.

.4 Any person who uses inappropriate language, or who is disruptive to the school environment, will be banned from the site.

.5 The Contractor's and its Subcontractors' personnel shall not converse with school employees, students and or local residents.

.6 All persons on the Project site will comply with all reasonable instructions regarding conduct and safety which are given by the Architect, the Construction Manager or the Owner's school administrators.

.7 All construction materials shall be stored in a safe and secure manner. No deliveries will be allowed during school bus drop off or pick up hours as determined by the Owner. All deliveries shall be scheduled and coordinated with the Construction Manager and the Owner's security department. Unexpected or uncoordinated deliveries may be turned away by the Owner or the Construction Manager at the discretion or necessity of the Owner. The Owner's enforcement of this provision shall not be construed by the Contractor or Subcontractor as the basis for a claim of delay in time or monetary damages alleged to have been incurred as a result of refusal of delivery.

.8 Use of the existing building facilities during construction is prohibited, specifically including toilet rooms, telephones and water fountains.

.9 The Contractor's schedule shall allow for blackout dates during which no noisy Work will be allowed, as determined by the Construction Manager. The Contractor may consult the Owner's school calendar for all test and examination dates, but these dates are subject to change.

.10 To gain access to the Work, entrances and parking areas will be designated by the Owner for the Contractor's use. Any vehicles or trucks in non-designated areas may be towed at the Contractor's expense. Gates shall always be locked unless a worker is in attendance to prevent unauthorized entry.

.11 Should it become necessary to obtain access to the existing building during construction hours for measurements or other non-disruptive work, the Contractor shall be escorted by the Construction Manager.

.12 All persons must wear photo identification badges at all times while working at the site. Identification badges must be provided by the Contractor for its personnel, including subcontractors, consultants, visitors and others.

.13 No asbestos containing products are to be used anywhere on this Project.

.14 No lead containing products are to be used anywhere on this Project.

.15 Asbestos manifests showing the locations of all known asbestos bearing materials are available in each building, and should be consulted prior to the commencement of any work, including but not limited to demolition.

.16 Demolition is to occur only when the building is unoccupied. Dust partitions and negative air are to be installed prior to commencing demolition. The Contractor must obtain Construction Manager approval on dust partitions and negative air prior to commencing demolition work. Debris shall be removed by using an enclosed chute or similar sealed system.

.17 (a) Prior to the commencement of Work, the Contractor must submit construction plans, which show the location of dust particles, exhaust & fresh air fans and describe in detail the operation procedures during demolition and construction which may generate dust.

(b) All entrances to classrooms shall be sealed with at least 6 mil. polyethylene sheeting to prevent dust created by demolition and construction work from entering the classrooms. Entrances and egress to the work zone shall be covered with a triple flap 6 mil. polyethylene doorway to allow access to the area without the release of dust. The Contractor is, additionally, responsible for all debris and dust infiltrating adjacent and undisturbed areas of the building.

(c) Shut down and lock out all electrical and HVAC in the work area. Cut, cap, and seal all duct work where it enters the work area from another space. All duct work and conduit within the space shall be removed during demolition work.
(d) The Contractor shall install dust protection barriers and poly sheeting. There shall be no or minimum damage to adjacent surfaces. The Contractor is responsible to repair any damage to existing surfaces.

.18 Painting or other chemical applications shall be done in the Owner's existing building only when it is unoccupied. Storage of chemicals and painting shall be outside the Owner's existing or new structures, and shall follow manufacturer's storage guidelines.

.19 Oxygen or other gas containers shall be properly stored and secured per OSHA requirements, to the satisfaction of the Construction Manager. Failure to do so will result in a $250 back-charge, per occurrence.

.20 The Contractor is responsible for cleaning its own materials and debris. Failure to maintain a clean work site daily will result in others performing the work at the Owner's request, and the Contractor will be backcharged for the cleaning cost plus construction administration fees. This may be done without the typical 3-day notice to the Contractor.

.21 The Contractor must send a qualified representative, knowledgeable in the Project and authorized to make decisions on behalf of the Contractor, to every Project meeting.

.22 The Contractor shall cooperate with the Owner's school principal and custodial staff; however, if any additional work is requested the Contractor shall not proceed unless written approval is received from the Owner. The Contractor will not be compensated for any additional work performed without the Owner's prior written approval.

.23 Deliveries sent to the Project site will not be signed for or unloaded by the Owner. They will be directed to the construction site and if no employee is on site, the delivery will be rejected, at the Contractor's expense.

.24 The General Construction Contractor shall be responsible for managing dust and dirt. On the exterior, site shall be watered down frequently to prevent dust clouds from rising. Streets shall be maintained clean per the Construction Manager's request.

.25 All hot tar roofing shall be installed after school hours or on weekends/holidays only. Kettles shall not be lit until all students have left the Owner's building.

.26 The Contractor shall submit a weekly work schedule indicating workdays, work hours and manpower allocation.

.27 No storage of materials will be permitted within the Owner's buildings at any time during construction. The Contractor must provide exterior storage containers when required. The Contractor shall be responsible for securing appropriate space for its material with the Construction Manager prior to delivery. Final location of storage containers shall be determined by the Owner and/or Construction Manager. If insufficient space is available on the site, the Contractor shall provide local off-site storage, storage containers, etc. at its own cost and expense. Should any of the material stored on-site obstruct the progress of any portion of the Work or the Project, this material shall be removed by the Contractor without reimbursement of cost, from place to place or from the premises, as the Construction Manager may direct.

.28 The General Construction Contractor shall be responsible for maintaining all appropriate site safety signage.

.29 The Contractor shall be responsible for protecting the Owner's property. All existing shrubs, trees, lawn fixtures, sculptures and miscellaneous equipment shall be protected at all times. Any removals or relocation of said objects, if allowed shall be as directed by the Owner in writing.

.30 The General Construction Contractor shall provide and service portable lavatories for the duration of construction as provided in the Contract Documents. Lavatories shall be serviced by the General Construction Contractor on a regular basis to maintain sanitary conditions.

.31 The General Construction Contractor shall protect all existing roofs during construction and shall be responsible for any damage to roofs during construction. The General Construction Contractor shall make all repairs to any damaged areas, as required by the manufacturer of the roof system.

.32 The General Construction Contractor shall be responsible for providing weather-proof protection over all rough openings, including windows.

.33 The Contractor shall be responsible for conducting pre-construction walk-throughs and videotaping existing conditions. The Contractor shall schedule a representative of both the Owner and the Construction Manager to be present at this taping. In the absence of this record, the Contractor shall be responsible for paying the costs associated with any and all repairs in an area where the Contractor is working or has worked, as may be deemed necessary by the Owner or the Construction Manager.

.34 Manufacturers Material Safety Data Sheets (MSDS) shall be available at the site for all products used in the Project.

.35 No weapons are permitted on the Owner's property by law.

.36 Neither the Contractor nor any person on its behalf shall, in any manner, engage in discrimination, intimidation or harassment of any person on the Project site.

.37 Proper attire is required for personal safety and clothing must not sexually explicit or contain messages of a vulgar nature, disrespectful of ethnic or religious groups, or which promote the use of tobacco, alcohol or drugs.

.38 Only materials and equipment that are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project site. Protection of construction materials and equipment stored at the Project site from weather, theft, damage, and all other adversity is solely the responsibility of the Contractor.

.39 The Contractor will ensure that the Work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. The Work will be performed in such a manner that public areas adjacent to the site of the Work will be free from all debris, building materials and equipment likely to cause hazardous conditions. Without limitation of any other provision of the Contract Documents, the Contractor will use its best efforts to minimize any interference with the occupancy or beneficial use of (1) any areas and buildings adjacent to the site of the Work; or (2) the Owner's building in the event of partial occupancy, as more specifically described in Section 9.9.

.40 The Contractor is required to protect its own Work and work areas, preconstruction, during construction and post construction.

.41 During exterior renovation work, overhead protection shall be provided for any sidewalks or areas immediately beneath the work site or such areas shall be fenced off and provided with warning signs to prevent entry.

.42 The Contractor shall exert utmost care and diligence when working in or near any existing buildings or site work. The absence of protection around such items shall not excuse the Contractor from its liability to provide protection. Any damage to existing buildings, sitework or facilities due to the actions or inactions of the Contractor shall be repaired by and charged to the Contractor.

.43 The Contractor shall be responsible for the removal and replacement of existing ceiling tiles and grid in areas of the existing building where its Work is required and new ceilings are not scheduled for installation. In the event that the existing ceilings are damaged and cannot be replaced to the satisfaction of the Owner, the responsible contractor shall be liable for the costs of replacing in kind, the existing ceilings with new tile and grid.

.44 The General Construction Contractor shall provide necessary and required security measures to adequately safeguard the construction site from vandalism and intrusion of unauthorized persons. The General Construction Contractor shall submit its means and methods of security to the Construction Manager for review and comment. The Project site must be secured 24 hours a day, 7 days a week including holidays. The General Construction Contractor's failure to secure the site as required by this paragraph will result in the Owner engaging the services of such necessary personnel so as to provide such security. No notice will be given the General Construction Contractor of the Owner's intention to engage such security services and all costs and expenses associated with the Owner's security of the site in this regard will be back charged to the General Construction Contractor. While the Owner may have security guards patrolling the project areas, the function of such security guards is not for the purpose of specifically guarding the Contractor's property or operations of work.

.45 The Contractor and any entity for which the Contractor is responsible shall not erect any sign on the Project site without the written consent of the Owner, which may be withheld in the sole discretion of the Owner.

.46 Without limitation of any other provision of the Contract Documents, the Contractor will comply with all reasonable rules and regulations promulgated by the Owner or Construction Manager in connection with the use and occupancy of the Project site and the buildings, as amended from time to time by the Owner or the Construction Manager.

§ 3.13.5 Only materials and equipment that are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project site. Protection of construction materials and equipment stored at the Project site from weather, theft, damage, and all other adversity is solely the responsibility of the Contractor.

§ 3.13.6 The Contractor shall ensure that the Work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. The Work will be performed in such a manner that public areas adjacent to the site of the Work will be free from all debris, building materials and equipment likely to cause hazardous conditions. Without limitation of any other provision of the Contract Documents, the Contractor shall use its best efforts to minimize any interference with the occupancy or beneficial use of (1) any areas and buildings adjacent to the site of the Work; or (2) the building in the event of partial occupancy, as more specifically described in Section 9.9.

§ 3.13.7 The Contractor shall not permit any workers to use any existing facilities at the Project site, including without limitation, lavatories and toilets. To gain access to the Work, entrances and parking areas will be designated by the Owner for the Contractor's use. Without limitation of any other provision of the Contract Documents, the Contractor will comply with all reasonable rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project site and the Owner's building(s), as amended from time to time by the Owner.

§ 3.13.8 Construction areas that are under the control of the Contractor and therefore not occupied by the Owner's staff or students shall be separated from occupied areas. Provisions shall be made to prevent the passage of dust and contaminants into occupied parts of the Owner's building(s). Periodic inspection and repairs of the containment barriers must be made to prevent exposure to dust or contaminants. Gypsum board must be used in exit ways or other areas that require fire rated separation. Heavy duty plastic sheeting may be used only for a vapor, fine dust or air infiltration barrier, and shall not be used to separate occupied spaces from construction areas.

§ 3.13.9 Prior to starting Work, the Contractor shall submit a written report to the Owner, Construction Manager and Architect identifying existing damage to roads, walks, lawns, buildings and other property to be affected by this Contract. Failure to submit the report shall render the Contractor responsible for existing damage. The Contractor may request and schedule an inspection with the Owner, Construction Manager and Architect prior to submittal of the report. The Contractor shall obtain the consent of adjoining property owners regarding temporary easements of any other manner of physical encroachment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner, Separate Contractors, or of other Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner, Separate Contractors, or by other Contractors except with written consent of the Construction Manager, Owner, and such other Contractors or Separate Contractors. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Separate Contractors, other Contractors, or the Owner, its consent to cutting or otherwise altering the Work.

§ 3.14.3 The word "new" used herein shall mean Work which has been or is to be installed under the terms of the Contract for this Project. The word "existing" used herein shall mean existing conditions previous to the award of a Contract for this Project. In order to eliminate cutting and patching as much as possible, the Contractor shall, during the progress of its Work, provide and set proper sleeves, inserts, and other fixtures as required for its new Work and shall give proper and detailed instructions to others where the Work may be affected by their work, with adequate notice prior to the erection of new Work. Cutting and patching work as required to install new Work or remove existing work shall be done carefully and neatly with as little damage as possible. The Contractor shall refer to the Specifications for proper cutting and patching requirements. Any costs caused by defective or ill-timed Work of the Contractor shall be borne by the Contractor. Cutting and patching of any Work shall be made in such a manner as to not breach any provisions of any guaranty or warranty on existing work left in place or any guaranty or warranty required for the Contractor's new Work. Patching of work shall match existing adjacent surfaces and patchwork shall be disguised completely to hide any trace of patching. All new Work on existing roofs must be provided by a company specializing in performing the Work and approved by the existing roofing material manufacturer. It shall be the responsibility of the Contractor performing the cutting and patching to maintain any existing roofing warranty.

§ 3.14.4 Only trades persons skilled and experienced in cutting and patching shall perform such work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. On a daily basis, the Contractor shall clean the areas in which it has performed work and shall remove all waste, materials, rubbish, its tools, construction equipment, machinery and surplus materials. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project. The Contractor shall completely clean the site of the Work, removing and disposing of all construction-related debris and rubbish, and cleaning all Work-related stains, spots, marks, dirt, mortar smears, plaster smears, paint smears, caulking smears, and other foreign materials from exposed surfaces inside and outside the Owner's buildings and within the Project limit lines.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner, or Construction Manager with the Owner's approval, may do so and the Owner shall be entitled to reimbursement from the Contractor. At its option, the Owner may deduct the cost of clean-up pursuant to this Section 3.15.2 from any payments otherwise due to the Contractor pursuant to this Contract.

§ 3.16 Access to Work

The Contractor shall provide the Owner, Construction Manager, and Architect with access to the Work in preparation and progress wherever located. Federal, state, and local agencies with jurisdiction over the Project shall at all times have access to the Work wherever it is in preparation or progress. The Contractor shall provide for such access so that such agencies may perform their functions. The Contactor shall also allow access for all required tests and inspections.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner, Construction Manager, and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner, Architect, or Construction Manager. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect through the Construction Manager.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall, and cause its Subcontractors to, defend, indemnify and hold harmless the Owner, Construction Manager, Architect, and their consultants, officers, directors, board members, agents and employees of any of them (collectively, "Indemnitees," individually, "Indemnitee") from and against all losses, damages, liabilities, actions, causes of action, claims, demands, fines, penalties, judgments, costs (including but not limited to attorneys' fees and expenses incurred in connection therewith and in the enforcement of this indemnification), charges, expenses and demands of whatever kind in connection with or arising from or out of (a) any negligent, willful or wrongful act or omission resulting in bodily injury (including death), personal injury or property damage (including loss of use) by the Contractor, its Subcontractors, Suppliers, their respective officers, employees, servants, agents, suppliers, invitees, successors and assigns (collectively, "Contractor Parties," and individually, "Contractor Party"), (b) performance of or failure to perform the Work or any breach of this Contract or infringement of any patent right by any Contractor Party, or (c) any statutorily imposed liability for injury to employees or failure to comply with any laws or regulations affecting the Work, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Nothing contained herein shall be construed to obligate the Contractor to indemnify, defend, and hold an Indemnitee harmless for claims caused solely by the Indemnitee's negligent acts or omissions.

The Contractor agrees to include the following indemnity provision in each and every contract it enters into with a Subcontractor, and to require that Subcontractor to include such provision in each contract it enters into with any lower tier Sub-subcontractor: "To the fullest extent permitted by law, sub-contractor shall defend, indemnify and hold harmless the Contractor, Owner, Owner's Consultants, Construction Manager's and Architect's consultants, and each of their respective representatives, board members, employees, directors, officers, and agents, from and against any and all claims, suits, actions, damages, losses, fines, penalties, costs, charges and expenses, including but not limited to attorneys' fees and the costs of any proceeding, arising out of or resulting from any performance of or failure to perform the Work, acts or omissions of the Subcontractor, its lower-tier Sub-subcontractors, and others for whom the Subcontractor is responsible, provided that such claim, damage, loss or expense is attributable to bodily

injury, sickness, disease or death, or economic losses or damages, damage to or destruction of property, and for environmental damage, or to injury to or destruction of tangible property and nuisance, but only to the extent caused by the acts or omissions or a breach of contract of the a Subcontractor, a Sub-Subcontractor to Subcontractor, and any person or entity directly or indirectly employed by them or any person or entity for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder."

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

§ 3.18.3 The Contractor's defense and indemnity obligations under this Section 3.18 shall specifically include all claims and judgments that may be made against the Indemnitees under the Labor Law of the State of New York, and similar laws of other state or governmental bodies having jurisdiction; and further, against claims and judgments arising from violation of public ordinances and requirements of governing execution of the Work.

§ 3.18.4 Claims by Governmental Authorities. To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Indemnitees from and against claims, damages, losses, and expenses arising out of any claims made against the Indemnitees under the laws of federal, state, or other governmental bodies having jurisdiction over the Work, including but not limited to claims arising from violation of public ordinances and other requirements of governing authorities, due to the Contractor's method of execution of the Work or implementation of any of the Contractor's other obligations under the Contract Documents.

§ 3.18.5 Liens and Security Interests. To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Indemnitees from and against any actions, lawsuits, or other proceedings brought against Indemnitees as a result of liens or security interests of any type arising from the Work and filed against the Work, the site of any of the Work, the Project site and any improvements thereon, payments due the Contractor, or any portion of the property of any of the Indemnitees.

§ 3.18.6 Intellectual Property. The Contractor shall defend, indemnify, and hold harmless the Indemnitees from and against any claim or demand for patent fees, royalties, or otherwise on account of any invention, machine, article, process, copyright, or arrangement that may be used by the Contractor in performing the Work, other than as to any of the foregoing expressly called for in the Contract Documents to be so used. In the event of any injunction or legal action regarding such claim or demand that results in stopping the Work in whole or part, the Owner shall have the right to direct the Contractor to change the manner of performance of the Work to avoid such stoppage, all cost and expense occasioned thereby to be borne solely by the Contractor.

§ 3.18.7 The Contractor shall further indemnify and hold harmless the Indemnitees from and against any costs and expenses (including reasonable attorneys' fees) incurred by any of the Indemnitees in enforcing any of the Contractor's defense, indemnity, and hold harmless obligations under this Section 3.18 or as may otherwise be provided elsewhere in the Contract.

§ 3.18.8 Subject to Section 3.18.9, all obligations of the Contractor under this Section 3.18 to defend the Indemnitees are obligations to provide full defenses at the sole cost and expense of the Contractor, regardless of any alleged culpability on the part of any Indemnitee or any ultimate determination of relative shares of liability of any Indemnitee or limitation of the Contractor's indemnity obligations in light of such determination.

§ 3.18.9 To the extent any defense, indemnity, or hold harmless obligations under this Section 3.18 are made void or otherwise impaired by any law controlling their construction (including but not limited to laws limiting such obligations to the extent of the portion of damages caused by an indemnitor), such obligations shall be deemed to conform to the greatest rights to defense and indemnity permitted by such law (including but not limited to New York State General Obligations Law Section 5-322.1).

§ 3.18.10 All provisions of this Section 3.18 shall survive termination of the Agreement or final completion. No obligations under this Section 3.18 shall be construed to negate, abridge, or reduce other rights or obligations to defense and indemnity, including but not limited to common law indemnity, which would otherwise exist as to a party or person described in this Section 3.18.

§ 3.19 Existing Features and Underground Data

§ 3.19.1 The location of existing features shown on plans is intended for general information only. The Contractor, alone, is responsible for accurate determination of the location of all structures, and shall not be entitled to any increase in the Contract Sum or Contract Time due to difficulties or distances encountered in the Work, which should have been foreseeable thereby.

§ 3.19.2 The locations, depths and data as to underground conditions have been obtained from records, surface indications and data furnished by others. Information furnished is solely for the convenience of the Contractor without any warranty, expressed or implied as to its accuracy or completeness. The Contractor shall make no claim against the Owner, Construction Manager or Architect with respect to the accuracy or completeness of such information if it is erroneous, or if the conditions found at the time of construction are different from those as indicated.

§ 3.20 Construction Stresses

§ 3.20.1 The Contractor shall be solely responsible for the conditions which develop during construction and in the event any structure is dislocated, over strained, or damaged so as to affect its usefulness, the Contractor shall be solely responsible. The Contractor shall, at its own expense, take whatever steps necessary to strengthen, relocate, or rebuild the structure to meet all applicable requirements.

§ 3.20.2 The Contractor is responsible for restoration or repair of utilities, private property, buildings, pavement, walkways, roads, or other property damaged by its activities under this Agreement.

§ 3.21 Training and Instructions

§ 3.21.1 Upon Substantial Completion of the Work, the Contractor shall orient and instruct personnel of the Owner designated by it in the operation and maintenance of all equipment furnished by the Contractor and shall turn over all pertinent literature and operational manuals relating to the equipment. The format for organizing, binding, and delivering such manuals shall be as described in the Specifications.

ARTICLE 4 ARCHITECT AND CONSTRUCTION MANAGER

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 The Construction Manager is the person or entity retained by the Owner pursuant to Section 2.3.3 and identified as such in the Agreement.

§ 4.1.3 The Architect is the interpreter of the technical requirements of the Drawings and Specifications with regard to questions the Contractor may have concerning its obligations under either. The Architect shall render such interpretations with such promptness as necessary to maintain progress of the Work. All changes in the Work must be processed through the Architect.

§ 4.2 Administration of the Contract

§ 4.2.1 The Construction Manager and Architect will provide administration of the Contract as described in the Contract Documents and will be the Owner's representatives during construction until the date the Architect issues the final Certificate for Payment and during the correction period described in Article 12. The Construction Manager and Architect have the authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of the site visits, the Architect will keep the Owner and the Construction Manager reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner and Construction Manager known deviations from the Contract Documents and defects and deficiencies observed in the Work.

§ 4.2.3 The Construction Manager shall provide one or more representatives who shall be in attendance at the Project site whenever the Work is being performed. The Construction Manager will determine in general if the Work observed

is being performed in accordance with the Contract Documents, will keep the Owner and Architect reasonably informed of the progress of the Work, and will promptly report to the Owner and Architect known deviations from the Contract Documents and the most recent Project schedule, and defects and deficiencies observed in the Work.

§ 4.2.4 The Construction Manager will schedule and coordinate the activities of the Contractor and other Contractors in accordance with the latest approved Project Schedule. The Contractor shall participate with other Contractors and the Construction Manager, the Architect and Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule deemed necessary by the Owner or Construction Manager. The approved construction schedules shall be integrated into the Project Schedule and constitute the schedules to be used by the Contractor, other Contractors, the Architect, the Construction Manager and the Owner until subsequently revised.

§ 4.2.4.1 The Contractor shall assume full responsibility for the execution of its Work in the allotted duration times set forth in the Project Schedule.

§ 4.2.5 The Construction Manager, except to the extent required by Section 4.2.4, and Architect will not have control over, or charge of, construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1, and neither will be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. Neither the Construction Manager nor the Architect will have control over or charge of or be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or of any other persons or entities performing portions of the Work.

§ 4.2.6 Communications Facilitating Contract Administration. Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Construction Manager, and shall contemporaneously provide the same communications to the Architect about matters arising out of or relating to the Contract Documents. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with other Multiple Prime Contractors shall be through the Construction Manager and shall be contemporaneously provided to the Architect if those communications are about matters arising out of or related to the Contract Documents. Communications by and with the Owner's own forces shall be through the Owner.

§ 4.2.7 The Construction Manager and Architect will review and certify all Applications for Payment by the Contractor, in accordance with the provisions of Article 9.

§ 4.2.8 The Architect and Construction Manager have authority to reject Work that does not conform to the Contract Documents and will notify each other about the rejection. The Construction Manager shall determine in general whether the Work of the Contractor is being performed in accordance with the requirements of the Contract Documents and notify the Owner, Contractor and Architect of defects and deficiencies in the Work. Whenever the Construction Manager considers it necessary or advisable, the Construction Manager will have authority to require additional inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, upon written authorization of the Owner, whether or not such Work is fabricated, installed or completed. The foregoing authority of the Construction Manager will be subject to the provisions of Sections 4.2.18 through 4.2.20 inclusive, with respect to interpretations and decisions of the Architect. However, neither the Architect's nor the Construction Manager's authority to act under this Section 4.2.8 nor a decision made by either of them in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect or the Construction Manager to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons performing any of the Work.

§ 4.2.9 Utilizing the submittal schedule provided by the Contractor, the Construction Manager shall prepare, and revise as necessary, a Project submittal schedule incorporating information from other Contractors, the Owner, Owner's consultants, Owner's Separate Contractors and vendors, governmental agencies, and participants in the Project under the management of the Construction Manager. The Project submittal schedule and any revisions shall be submitted to the Architect for approval.

§ 4.2.10 The Construction Manager will receive and promptly transmit to the Architect all submittals from the Contractor such as Shop Drawings, Product Data and Samples. The Construction Manager's actions will be taken in

accordance with the Project submittal schedule approved by the Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness while allowing sufficient time to permit adequate review by the Architect.

§ 4.2.11 The Architect will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Upon the Architect's completed review, the Architect shall transmit its submittal review to the Construction Manager.

§ 4.2.12 Review of the Contractor's submittals by the Architect is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.12.1 The Architect's review of Contractor's submittals shall be limited to an initial submittal and one (1) resubmittal. If the Architect is required to review additional submittals because the initial submittal and resubmittal failed to conform to the information given and the design concept expressed in the Contract Documents, the amount of compensation paid to the Architect by the Owner for additional services shall be deducted from the payments to the Contractor.

§ 4.2.12.2 The review will not be considered complete until an "ACTION" stamp or other written notice to that effect has been received by the Contractor.

§ 4.2.13 The Construction Manager will prepare Change Orders, Allowance Disbursements and Construction Change Directives.

§ 4.2.14 The Construction Manager and the Architect will take appropriate action on Change Orders or Construction Change Directives in accordance with Article 7 and the Architect will have authority to order minor changes in the Work as provided in Section 7.4. The Architect, in consultation with the Construction Manager, will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.15 Utilizing the documents provided by the Contractor, the Construction Manager will maintain at the site for the Owner one copy of all Contract Documents, approved Shop Drawings, Product Data, Samples and similar required submittals, in good order and marked currently to record all changes and selections made during construction. These will be available to the Architect and the Contractor, and will be delivered to the Owner upon completion of the Project.

§ 4.2.16 The Construction Manager will assist the Architect in conducting inspections to determine the dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion in conjunction with the Architect pursuant to Section 9.8; and receive and forward to the Owner written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10. The Construction Manager will forward to the Architect a final Application and Certificate for Payment or final Project Application and Project Certificate for Payment upon the Contractor's compliance with the requirements of the Contract Documents.

§ 4.2.17 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.18 The Architect will interpret and decide matters concerning performance under, and requirements of the Contract Documents on written request of the Construction Manager, Owner or Contractor through the Construction

Manager. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.19 Interpretations and decisions of the Architect will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings.

§ 4.2.19.1 If Work is described or indicated in a manner which makes it impossible to carry out the requirements of the Contract Documents, or should discrepancies appear among the Contract Documents, the Contractor shall request interpretation before proceeding with the Work. If the Contractor fails to make such a request, no excuse will be entertained for failure to carry out the Work of the Contract Documents. Should a conflict occur in or between Contract Documents, the Contractor is deemed to have included in the Contract Sum the more expensive manner of doing the Work.

§ 4.2.20 The Architect's decisions, after consultation with the Owner, on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.21 The Construction Manager will receive and review requests for information from the Contractor, and forward each request for information to the Architect, with the Construction Manager's recommendation. The Architect will review and respond in writing to the Construction Manager to requests for information about the Contract Documents. The Construction Manager's recommendation and the Architect's response to each request will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include other Contractors or Separate Contractors or the subcontractors of other Contractors or Separate Contractors.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, within 10 days after award of the Contract, shall furnish in writing to the Construction Manager for review by the Owner, Construction Manager and Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Construction Manager may reply within 14 days to the Contractor in writing stating (1) whether the Owner, the Construction Manager or the Architect has reasonable objection to any such proposed person or entity or, (2) that the Construction Manager, Architect or Owner requires additional time for review. Failure of the Construction Manager, Owner, or Architect to reply within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.1.1 In no case shall payments be made on the Contract until a complete list of Subcontractors has been submitted by the Contractor to the Construction Manager for review by the Owner, Construction Manager, and Architect. Such list shall not be considered complete if the Owner, Construction Manager or Architect has any reasonable objection to any name listed thereon. Such list shall be submitted and resubmitted if necessary until it is considered complete.

§ 5.2.1.2 Subcontractors will not be acceptable unless, when requested by the Owner, Architect or Construction Manager, evidence is furnished by the Contractor that the proposed Subcontractor has satisfactorily completed similar subcontracts as contemplated under this Contract, and has the necessary experience, personnel, equipment, plant and financial ability to complete the proposed subcontract in accordance with the intent of the Contract Documents and the Project Schedule. As verification of financial ability, the Owner reserves the right to request and

receive up to five (5) years of financial statements, bank references, bond/insurance company references and all other information required to assess financial ability.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner, Construction Manager or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner, Construction Manager or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner, Construction Manager and Architect have no objection.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner, Construction Manager or Architect makes reasonable objection to such substitution.

§ 5.2.5 The Maintenance of the Project Schedule is critical. The Contractor shall award subcontracts to entities capable of performing in a manner that will maintain the Project Schedule and require its subcontractors to complete their work in accordance with the Project Schedule.

§ 5.2.6 Upon written request from or on behalf of the Owner, the Contractor shall provide to the Owner executed, unredacted copies of all subcontracts, purchase orders or other agreements relating to the Work.

§ 5.3 Subcontractual Relations

§ 5.3.1 By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner, Construction Manager and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner, Construction Manager and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors. Each subcontract shall contain provision for execution of lien waivers in form and substance acceptable to the Owner as a condition of payment by the Contractor. The Contractor shall require each Subcontractor to (1) inspect the Project site, including all relevant surfaces and job conditions, before beginning the Work and (2) accept or cite necessary corrections in the Project site, including surfaces or job conditions, before beginning the Work.

§ 5.3.2 The Contractor shall promptly notify the Owner and Architect of any material defaults by any Subcontractor or whether it has terminated its agreement with any of its Subcontractors for any reason.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- **.1** assignment is effective only after termination of the Contract by the Owner pursuant to Article 14 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- **.2** assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 60 days, through no fault of the Subcontractor, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor Contractor or other entity.

§ 5.4.4 All subcontracts over $10,000 shall be in writing with copies of the written subcontract provided to the Owner promptly upon request.

§ 5.5 Payments to Subcontractors; Release of Liens and Claims. The Contractor shall pay each Subcontractor in accordance with subparagraph 9.6.2. The Contractor shall require each Subcontractor to submit with each application for payment a Release of Liens and Claims in a form approved by the Owner. The Owner shall have no obligation to pay, or to see the payment of any monies to any Subcontractor.

§ 5.6 No Relationship with Subcontractors. Nothing contained in this Contract shall be deemed to create any contractual relationship between the Owner and any Subcontractor or to create rights in any Subcontractor against the Owner. The Contractor shall promptly advise the Owner of any claim or demand by a Subcontractor claiming that any amount is due to such Subcontractor or claiming any default by the Contractor in any of its obligations to such Subcontractor.

§ 5.7 Discharge of Construction Liens. If any of the Contractor's Subcontractors or Sub-subcontractors file a construction lien against the Project or the Owner's Project funds, the Contractor shall within five (5) days of receipt of notice from the Owner, cause any such liens to be released by procuring and recording a bond or otherwise arrange for the removal or discharge of the lien. If the Contractor does not cause the lien to be released and discharged or removed, the Owner shall have the right to pay all sums necessary to obtain such a release and discharge, and to cause the costs it incurs in doing so (including reasonable attorneys' fees) to be paid by the Contractor. The Contractor shall indemnify, defend, and hold harmless the Owner from all claims, losses, demands, and causes of action or suits of whatever nature, including with respect to attorneys' fees incurred by the Owner, arising out of any such lien. The Contractor's obligation to indemnify in this paragraph shall be in addition to the Contractor's obligations to indemnify set forth elsewhere in this Contract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction with Own Forces and to Award Other Contracts

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, which include persons or entities under separate contracts not administered by the Construction Manager, and to award other contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. Should the Contractor sustain any damage or delay through any act or omission of other Contractors having a contract with the Owner, or should the Contractor sustain any damage or delay through any act or omission of a Subcontractor, the Contractor shall have no claim against the Owner or its Architect or Construction Manager for such damage or delay.

§ 6.1.2 When the Owner performs construction or operations with the Owner's own forces or Separate Contractors, the Owner shall provide for coordination of such forces and Separate Contractors with the Work of the Contractor, who shall cooperate with them.

§ 6.1.2.1 The Contractor shall provide for coordination of its activities with the activities of each other Contractor. This includes, but is not limited to, the Owner's own forces or separate the Contractor's employed directly by the Owner.

§ 6.1.3 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.1.4 The Contractor accepts assignment of, and liability for, all purchase orders and other agreements for procurement of materials and equipment that are identified as part of the Contract Documents. The Contractor shall be responsible for such pre-purchased items, if any, as if the Contractor were the original purchaser. The Contract

Sum includes, without limitation, all costs and expenses in connection with delivery, storage, insurance, installation and testing of items covered in any assigned purchase orders or agreements. All warranty and correction of the Work obligations under the Contract Documents shall also apply to any pre-purchased items unless the Contract Documents specifically provide otherwise.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor recognizes and acknowledges that the Project is governed by and subject to the provisions of New York State General Municipal Law §101, et seq., governing the award of contracts on public improvement projects. As such, the Contractor recognizes and acknowledges that other Contractors or Separate Contractors will be performing work on the Project in conjunction with it. As such, the Contractor shall afford the Owner's own forces and other Contractors or Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.1.1 The Contractor shall not commit or permit any act which will interfere with the performance of the work of any other Contractor or Separate Contractor performing work on the Project. If the Contractor sustains any damage through any act or omission of Separate or other Contractors having a contract with the Owner for the performance of work upon the site or of work which may be necessary to be performed for the proper execution of the work to be performed hereunder, or through any act or omission of a subcontractor of such Separate or other Contractor, the Contractor shall promptly notify the Owner and the Construction Manager of such damage

§ 6.2.1.2 The Contractor agrees to defend, indemnify and hold harmless the Owner, Architect, Construction Manager, Consultants and Sub-consultants, from all claims made against any of them arising out of the Contractor's acts or omissions or the acts or omissions of any Subcontractor of the Contractor which have caused damage to the Owner, Architect, Construction Manager, Separate Contractor or other Contractor on the Project. The Owner's right to indemnification hereunder shall in no way be diminished, waived or discharged, or by the exercise of any other remedy provided for by the contract or by law. Further, the Owner shall withhold from the Contractor's Contract Sum an amount sufficient to cover such damage and all expenses and costs associated with the damage sustained.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner's own forces, Separate Contractors or other Contractors, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Construction Manager and Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor or other Contractors that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Construction Manager and the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's or other Contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractors or other Contractors that are not apparent.

§ 6.2.2.1 The Contractor shall promptly correct discrepancies or defects in its Work identified by Separate Contractors as affecting proper execution and results of the work of the Separate Contractors.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs, including costs that are payable to a Separate Contractors or to other Contractors, because of the Contractor's delays, improperly timed activities or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction, or to property of the Owner, Separate Contractors, or other Contractors as provided in Section 10.2.5 or elsewhere in the Contract Documents.

§ 6.2.5 The Owner, Separate Contractors, and other Contractors shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.2.6 Should the Contractor or its Subcontractors cause damage to the work or property of any Separate Contractor or other Multiple Prime Contractor, the Contractor shall, upon due notice, promptly attempt to settle by agreement or otherwise resolve the dispute with the Separate Contractor or other Multiple Prime Contractor. If such Separate Contractor or other Multiple Prime Contractor sues or makes any other claim against the Owner, Construction Manager, or Architect on account of any damage alleged to have been caused by the Contractor or its

Subcontractors, the Contractor shall defend, indemnify, and hold harmless the Owner, Construction Manager, and Architect against such claim or proceedings at the Contractor's own expense. The Owner's right to indemnification hereunder shall in no way be diminished, waived or discharged, or by the exercise of any other remedy provided for by the Contract Documents or by law. Further, the Owner shall be entitled to withhold from the Contractor's Contract Sum an amount sufficient to cover such damage and all expenses and costs associated with the damage sustained.

§ 6.2.7 When the Work of the Contractor or its Subcontractors overlap or dovetail with that of other Contractors, materials shall be delivered and operations conducted to carry on the Work continuously, in an efficient, workmanlike manner.

§ 6.2.8 In case of interference between the operations of the Contractor and other Contractors, the Construction Manager will be the sole judge of the rights of each contractor and shall have the authority to decide in what manner the Work may proceed, and in all cases its decision shall be final. Any decision as to the method and times of conducting the Work or the use of space as required in this paragraph shall not be basis of any claim for delay or damages by the Contractor.

§ 6.2.9 The Contractor, including its Subcontractors, shall keep itself informed of the progress of other Contractors and shall notify the Architect or the Construction Manager immediately in writing of lack of progress on the part of other Contractors where such delay will interfere with its own operations. Failure of the Contractor to keep informed of the work progressing on the Project and failure to give notice of lack of progress by others shall be construed as acceptance by the Contractor of the status of the work as being satisfactory for proper coordination with the Contractor's Work.

§ 6.2.10 Delays or oversights on the part of the Contractor or its Subcontractors in getting any or all of the Work done in the proper way, thereby causing cutting, removing and replacing Work already in place, shall not be the basis for a claim for either an increase in the Contract Sum or Contract Time.

§ 6.2.11 The Contractor shall promptly correct discrepancies or defects in its Work which have been identified by Separate Contractor(s) or other Contractor(s) as affecting proper execution and results of the work of such Separate Contractor(s) or other Contractor(s).

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, other Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Construction Manager, with notice to the Architect, will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, only by Change Order, Construction Change Directive or field order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents. The Owner may in its sole discretion reduce the scope of the Contractor's Contract with or without any specific reasons therefor.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Construction Manager, Architect and Contractor; a Construction Change Directive requires agreement by the Owner, Construction Manager and Architect and may or may not be agreed to by the Contractor; a field order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.2.1 Field orders are an interpretation of the Drawings or Specifications which order minor changes in the Contractor's work which will not result in an increase or decrease in the Contract Sum. From time to time, the Architect may issue field orders to the Contractor. The work included in such field order shall be performed by the Contractor at no additional cost to the Owner and shall not form the basis for a claim for an extension of the Contract Time. Hence, the Contractor shall perform the work included in field orders so as to cause no delay to its Work and/or the work of other Contractors or Separate Contractors engaged by the Owner in connection with the Project. All field orders shall be given to the Contractor and the Construction Manager by the Architect in writing.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or field order for a minor change in the Work. Additional work performed without authorization of a Change Order will not entitle the Contractor to an increase in the Contract Sum or an extension of the Contract Time. No course of conduct or prior dealings between the parties, nor express or implied acceptance of alterations or additions to the Work, and no claim that the Owner has been unjustly enriched by any alteration or addition to the Work, whether or not there is, in fact, any unjust enrichment of the Owner, shall be the basis for any claim to an increase in any amounts due under the Contract Documents or a change in any time period provided for in the Contract Documents. No amount shall be payable by the Owner to the Contractor for performance of work without a written and fully executed Change Order.

§ 7.1.4 Costs for changes in the Work shall not be allowed in excess of usual rentals charged in the area where the Project is located for similar equipment of like size and condition, including costs of necessary supplies and repairs for operating equipment on site in connection with other work unless its use incurs actual and additional costs to Contractor. If equipment not on Site is required for change in work only, cost of transporting equipment to and from Site will be allowed.

§ 7.1.5 When the Owner or Architect (in association with the Construction Manager) request that the Contractor perform work which is not included in the Contract Drawings or Specifications and which will result in additional cost to the Owner, the Architect shall request that the Contractor submit its proposal for performing such additional work. The Contractor shall submit its proposal to the Construction Manager and Architect for review. The Contractor's proposal shall include a complete itemization of the costs associated with performing its work including labor and materials. All proposals for any work that a Contractor, its Subcontractor(s) or Sub-subcontractor(s) perform in connection with additional work shall be properly itemized and supported by sufficient substantiating data, including but not limited to material descriptions, material quantities, material unit prices, labor trade listings, labor hour quantities, labor trade rates, equipment descriptions and equipment rates with a percentage allowance for overhead and profit as set forth in Section 7.3.11. The Contractor's proposal shall also set forth the impact on the milestone and critical path dates set forth in the Contract Documents, the construction schedule and the Project schedule, which would result from implementation of the change, and be accompanied by such other information as the Owner may request.

§ 7.1.6 Overtime, when specifically authorized by the Owner in writing, and not as a corrective measure by the Contractor to expedite the progress of construction as ordered by the Owner based on its determination that the performance of the Work has not progressed to the level of completion required by the approved Schedule, shall be paid for by the Owner on the basis of premium payment only, plus the cost of insurance and taxes based on the premium payment period. Overhead and profit will not be paid by the Owner for overtime.

§ 7.1.7 Unit prices shall be submitted in the Bid Form for various items as set forth therein, and are subject to approval and acceptance by the Owner. The Owner reserves the right to reject any unit price which is unreasonable or unbalanced, as compared with prevailing costs, or as compared with the unit prices submitted by other bidders for the Project. Approved unit prices quoted shall include all profit, overhead, bonds, insurance, labor, materials, equipment, tools, applicable taxes necessary to complete the work item and shall apply to all work added or work deducted.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Construction Manager and signed by the Owner, Construction Manager, Architect, and Contractor, stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.2.1.4 Changes in the Work involving additional Work or deletion of Work effecting an addition to or subtraction from the Contract Sum shall not be made until the Contractor submits to the Architect and Construction Manager the cost of the added or deleted Work with a complete and detailed listing of all Subcontractors involved, all materials, labor, overhead and profit, the impact on the Contract Time, and an appropriate Change Order has been issued. If requested, the Contractor shall submit detailed quotations for Subcontractors and material suppliers. Changes in the Work when not involving additions or deletions from the Contract Sum shall not be made until the Architect has issued an appropriate Change Order. All Change Orders must have the approval of the Owner, Construction Manager and Architect in writing. No change in Contract Time shall be allowed for Change Orders, except for

substantial changes in scope determined by the Owner. In the case of increased scope, it is expected that Change Order work shall be performed by increased manpower.

§ 7.2.2 Methods used in determining adjustments to the Contract Sum may include those listed in Section 7.3.3, as well as the limitations set forth in Sections 7.3.4 and 7.3.11. The Owner shall have the right to select the method of pricing to be used by the Contractor.

§ 7.2.3 Agreement on any Change Order shall constitute a final settlement of all Claims and other matters related to the change in Work that is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change (including, without limitation, all costs of associated delay, interference, acceleration, inefficiency, overhead, as well as costs of material, labor and supervision), and any and all adjustments to the Contract Sum and the Contract Time. Payment of a Change Order shall constitute accord and satisfaction of all Claims of the Contractor in connection with the change or changes to the Contract addressed by the Change Order and it is understood and agreed that a signed Change Order shall be the complete and fully integrated agreement for all related costs and there are no oral or written understandings, reservations, representations or agreements, directly or indirectly, connected with the Change Order and not affirmatively stated on the signed Change Order. In the event a Change Order increases the Contract Sum, the Contractor shall include the Work covered by such Change Orders in Applications for Payments as if such Work were originally part of the Contract Documents.

§ 7.2.4 Upon the Contractor's completion of the Change Order work, and prior to payment being made to the Contractor for such work, the Contractor shall provide the Owner with the following information:

.1 Certified payrolls itemizing the labor actually utilized in connection with the Change Order work; and

.2 Copies of invoices from its Subcontractors supplying work in connection with the Change Order work.

§ 7.2.5 Additional work performed without authorization of a Change Order will not entitle the Contractor to an increase in the Contract Sum or an extension of the Contract Time, except as provided in Section 7.3, and except in the case of an emergency as provided in Section 10.4.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Construction Manager and signed by the Owner, Construction Manager and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly. A Construction Change Directive may also be used to direct the Contractor to remedy its nonconforming or defective Work.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order or to direct the Contractor to remedy its nonconforming or defective Work. In the event the Contractor and the Owner cannot agree on the sum by which the Contract Sum or the amount of time by which the Contract Time is to be increased or reduced based upon changes to the scope of the Work as described in Article 7, or due to the Contractor's failure to perform the Work in accordance with the Contract Documents, the Architect or Construction Manager shall issue a Construction Change Directive directing the Contractor to proceed with the disputed Work or correct defective Work and, if applicable, reflecting the addition to or reduction of the scope of the Contractor's Contract and the corresponding change in the Contract Sum or Contract Time, if any.

§ 7.3.2.1 If the Owner and the Contractor cannot agree that the requested Work properly forms the basis for a Change Order or on the sum by which the Contract is to be increased or reduced based upon changes to the scope of Work, the Architect or Construction Manager shall issue a Construction Change Directive signed by the Owner, Construction Manager and Architect reflecting the addition to, or removal of, the scope of Work and the Contractor shall (a) in the case of additional work to be performed by the Contractor, perform such additional work in an expeditious manner so as not to delay the Work of the Contractor or other Contractors working at the site and keep records of its performance of such additional work, and (b) in the case of work to be removed from the scope of the Contractor's Work, refrain from taking any steps in connection with the work associated with the deduction of the Contractor's Work. The Construction Change Directive shall include: (a) a description of the work being added or removed from the Contractor's scope of Work; (b) the amount the Owner has determined to be the cost associated with the additional work (as those costs are identified and limited in Sections 7.3.4 and 7.3.11) or removal of the scope of the Contractor's Work until the Owner and the Contractor agree upon the increase or decrease in the

Contractor's Contract Sum, or until a claim filed by the Contractor has been determined; and (c) the extent to which the Contract Time will be adjusted as a result of the change in the scope of Work. Any claims must be filed in accordance with the requirements set forth in Article 15 of these General Conditions. Failure to timely file any claim in accordance with requirements set forth therein shall constitute a waiver of such claim.

§ 7.3.3 If the Construction Change Directive provides for a method for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- **.1** Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- **.2** Unit prices stated in the Contract Documents or subsequently agreed upon (unit prices shall be deemed to include all costs and expenses for the Contractor's changed Work, including costs of general conditions, insurance/bonds and overhead and profit attributable to the change);
- **.3** Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee subject to the limitations of Section 7.3.11;
- **.4** As provided in Section 7.3.4 subject to the limitations of Section 7.3.11; or
- **.5** As provided in Section 7.3.2.1.

§ 7.3.4 If the Construction Change Directive provides for a reasonable expenditure and savings method of adjusting the Contract Sum, the Construction Manager shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in Section 7.3.11. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Construction Manager may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- **.1** Actual costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers compensation insurance;
- **.2** Actual costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed. Sales taxes, if any are required, shall be indicated and added after the cost of the change is calculated. No overhead or profit will be paid on sales tax;
- **.3** Actual rental costs of machinery and equipment, exclusive of hand tools, rented from third parties; and
- **.4** Actual costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the additional work. The Contractor shall submit with its proposal actual invoices from its insurance broker reflecting actual additional costs associated with the procurement of bonds and insurance. Bond premiums and/or credits shall be invoiced per Change Order. Lump sum bond premium requests will not be considered at the end of the Project.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Sum or Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction Manager of the Contractor's agreement or disagreement with (1) the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time or (2) the amount of the increase or decrease in the Contract Sum and Contract Time as provided in Section 7.3.2.1. Any claims must be filed in accordance with the requirements set forth in Article 15 of these General Conditions. Failure to timely file any claim in accordance with requirements set forth therein shall constitute a waiver of such claim.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 When the Owner or Architect request that portions of the Contractor's Work originally included in the Drawings or Specifications be deleted and which will result in a reduction of the Contract Sum, the Architect shall request that the Contractor submit its proposal for deleting the scope of such Work from the Contract. The Contractor's proposal shall include a complete itemization of the costs associated with deducting such Work including labor, materials, overhead and profit. The Contractor shall not be entitled to retain its overhead or profit for such work nor shall any of its Subcontractors which were to perform the work being deducted from the Contractor's scope of Work. Additionally, the Contractor shall reflect the reduced cost of premiums on bonds which

are to be supplied herein as a result of such change. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Construction Manager and Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Construction Manager and Architect determine to be reasonably justified. The interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Construction Manager and Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Construction Manager shall prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.3.11 The limit for the combined overhead and profit included in the total cost to the Owner shall be based on the following schedule:

- **.1** For the Contractor, for Work performed by the Contractor's own forces, fifteen percent (15%) of the direct cost for labor and materials.
- **.2** For the Contractor, for Work performed by the Contractor's Subcontractor, maximum of five percent (5%) of the amount due the Subcontractor for the Contractor's overhead and profit. For the Subcontractor, for Work performed by the Subcontractor's own forces, ten percent (10%) of the direct cost for labor and materials. The total combined overhead and profit for a change order shall be limited to 15% of the direct cost regardless if the Work is performed by the Contractor or the Subcontractor.
- **.3** The markup on any part of the Work a Subcontractor subcontracts will be limited to one overhead and profit figure, in addition to the Contractor's overhead and profit markup. The Subcontractor and Sub-subcontractor may divide the overhead and profit amount as they agree upon.
- **.4** Costs to which overhead and profit is to be applied shall be determined in accordance with Section 7.3.4.
- **.5** In order to facilitate checking of quotations for extras and credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials, and subcontracts. Labor and material shall be itemized in the manner prescribed above. Where major cost items are subcontracts, they shall be itemized also.
- **.6** Overhead and profit mark-up shall include, but not be limited to, the following:
  - **.1** home office expense;
  - **.2** field office expense;
  - **.3** supervision;
  - **.4** project management & estimation;
  - **.5** small tools & equipment;
  - **.6** research & layout;
  - **.7** inspections & permits;
  - **.8** material handing;
  - **.9** record drawings: and
  - **.10** safety and cleanup.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Construction Manager and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Construction Manager that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement. The date shall not be postponed or extended by the failure to act of the Contractor or persons or entities for whom the Contractor is responsible to act.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8. The date of final completion is the date certified by the Architect and Owner in accordance with Section 9.10. Unless otherwise agreed in writing by the Owner, the Contractor agrees that Final Completion shall occur not more than 30 calendar days after the date of Substantial Completion.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.1.5 Work remaining to be completed after Substantial Completion, shall be limited to items which can ordinarily be completed within a thirty (30) day period (one month) before final payment is made.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.1.1 The Contractor recognizes that the Project Schedule is of critical importance to the Owner and that failure by the Contractor to complete the Work in accordance with the construction schedule may cause significant damages to the Owner, including but not limited to the loss of State Aid from the State Department of Education. All aspects of construction must reflect a "time is of the essence" construction strategy. The "Bid Schedules" serve as a guide of critical milestone dates to the Project. Failure to meet intermediate milestone dates will jeopardize the overall Project Schedule. If the Contractor's performance of the Work evidences, to the Owner, Construction Manager or Architect, that timely completion may be in jeopardy, this will mandate the Contractor to increase staff, work overtime, or use other means to recover time, at the costs of the Contractor responsible for such delays. In addition, all costs due to delays in completion of the Work shall be borne by Contractor(s) responsible for delays.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner and the Owner's approval of such insurance. The date of commencement of the Work shall not be changed by the effective date of such insurance. The Work can not start until the required insurance and bonds are provided and the Contract has been executed.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion and final completion within the Contract Time. The Contractor agrees that the Work shall be prosecuted regularly, diligently and uninterruptedly at such rate of progress as will ensure full completion thereof within the Contract Time specified and, further, to provide such protections as may be necessary. It is expressly understood and agreed by the Contractor that the time for the substantial and final completion of the Work is a reasonable time for its completion, taking into consideration, among other things, the average climatic range and usual weather conditions prevailing in the Project's locality. The Contractor shall cooperate with the Owner, Architect, and other Contractors on the Project, making every reasonable effort to reduce the Contract Time.

§ 8.2.4 In no case shall the Contractor delay the progress of the Work, or any part thereof, on account of changes in the Work or disputes caused by proposed or ordered changes in the Work (including the equitable value of the changes), or any disputes or disagreements as to the Work or extra work.

§ 8.2.5 The Contractor recognizes that achieving Substantial Completion and final completion of the Work in accordance with the time limits set forth in the Agreement and as further set forth in the Milestone Schedule provided in the Project Manual are material conditions of this Agreement, and that if the Contractor fails to achieve Substantial Completion and final completion of the Work in accordance with such schedule, the Owner will incur damages as a result. The Owner and Contractor agree that the amount of such damages is difficult to ascertain with any precision. The Contractor and Owner have attempted to estimate reasonable daily figures for liquidated

damages, not to penalize the Contractor for late completion, but to reasonably estimate probable losses and damages to the Owner in the event of the late completion. If the Contractor does not achieve the completion date and milestone date for each Work item in the Contract, a milestone or critical path date reflected on the Project Schedule, or the date of Substantial Completion or final completion for the Work or any part thereof, liquidated damages will be assessed in the amount of $1,000.00 for each and every calendar day after such time allowed for completion until Substantial Completion or final completion actually occurs.

§ 8.2.5.1 The Contractor realizes that time is of the essence on this Contract and the Substantial Completion date and final completion date for each Work item in its Agreement, a Milestone Date reflected on the Project schedule, or the date of Substantial Completion or final completion of the Contractor's Work shall be no later than the date indicated therein. In the event the Contractor fails to complete any Work or substantially complete the Work by said schedule date, the sum per calendar day for each date not met, as delineated above, will be subtracted from the payment due the Contractor (or, if the amount due Contractor as payment is insufficient, any deficiency shall be paid by the Contractor to the Owner), except in cases where the Contractor has applied for and been granted an extension of the Contract Time in accordance with the provisions of the Contract Documents.

§ 8.2.5.2 The said sum per calendar day shall constitute the liquidated damages incurred by the Owner for each day of delay beyond the agreed upon dates of Substantial Completion or final completion. The foregoing liquidated damages are intended to compensate the Owner only for the loss of beneficial use of the Work of the Contract. In the event the Contractor fails to complete all Work under this Contract by said scheduled dates, in addition to the liquidated damages incurred by the Owner in connection with the Contractor's delay, to the fullest extent permitted by law, the Contractor shall be liable for all costs incurred by the Owner for additional services provided by the Architect and Construction Manager, as well as liabilities to other Contractors and Separate Contractors working on the Project.

§ 8.2.5.3 The Owner's right to liquidated damages shall survive abandonment of the Work by the Contractor or the Owner's termination of the Contract.

§ 8.2.5.4 Notwithstanding the foregoing, if one or more of the liquidated damages provisions set out in the Agreement are held to be legally unenforceable as a penalty, the Owner shall be allowed to recover actual damages caused by the Contractor's failure to achieve the applicable Contract Time requirements.

§ 8.2.6 In the event the Contractor fails to complete all Work under this Contract by said scheduled dates, the Contractor will not be permitted to perform any work during normal school hours without the express written authorization of the Owner. Such Work shall only be performed after school hours, Saturdays, Sundays, holidays or periods when school is unoccupied (subject to any restrictions of authorities having jurisdiction over the Project) at no additional cost of any kind to the Owner. In addition to damages incurred by the Owner in connection with the Contractor's delay, the Contractor shall be liable for all costs incurred by the Owner to provide staff, Architect and Construction Manager personnel as required to make the site available to the Contractor and perform inspections during such off hours.

§ 8.2.7 The Contractor understands that in order to meet the requirements of the Project Schedule, including intermittent milestone and critical path dates set forth in the Contract Documents, it may be required to work its personnel and equipment overtime on regular work days and on Saturdays and holidays, the cost of which is included in the Contract Sum. If the Owner specifically approves in writing reimbursement for overtime, the Contractor shall be paid by the Owner on the basis of the premium payment.

§ 8.2.7.1 The Contractor may request access to the site during times beyond the work hours permitted. Approval is solely at the discretion of the Owner. If approval is given, the Contractor is responsible for paying all additional costs incurred by the Owner, Architect and Construction Manager for providing the site to the Contractor during the additional time periods.

§ 8.2.8 The Owner shall have the right at any time to modify the Project Schedule; to suspend, delay or accelerate, in whole or in part, the commencement or execution of the Work or any potion thereof or to vary the sequence thereof; and to prescribe the time, order and priority of the various portions of the Work, and all other matters relating to the scheduling of the Work. The Contractor shall not be entitled to additional compensation for any such decisions made by the Owner.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed in the commencement or progress of the Work as a result of: Acts of God (such as tornado, flood, hurricane, pandemics, epidemics, etc. making performance temporarily impossible); the negligent acts or omissions of the Owner, Architect, Construction Manager, other Contractors, or their agents or employees in the performance of their respective obligations for the Work; strikes, lockouts or other labor disturbances (not arising from the labor practices of the Contractor or its Subcontractors, Suppliers, or Sub-subcontractors to comply with their obligations arising under the Contract); unusually adverse weather conditions; freight embargoes (provided that delays by the Contractor, its Subcontractors, Sub-subcontractors or Suppliers do not constitute an excusable cause of delay); changes in the Work to be performed by the Contractor (not caused or resulting from the failure of the Contractor or its Subcontractors, Suppliers or Sub-subcontractors); changes to laws or regulations after the effective date of the Contract; or any other cause beyond the reasonable control of the Contractor and its Subcontractors as determined by the Owner, provided the Contractor has used all reasonable efforts to mitigate the foregoing causes; then the Contractor shall be entitled to a day for day extension of the Contract Time for the established delay to the critical path of the Work subject to the provisions of this Article 8 and Article 15. Notwithstanding anything in the foregoing to the contrary, to the extent a delay is caused by the negligent acts or omissions of the Owner, Architect, Construction Manager, other Contractors, or their agents or employees, the Contractor agree to use its best efforts to provide the Owner with prompt written notice of any such act or omission that could reasonably be expected to cause an excused delay. The extension of time provided under this Section 8.3.1 shall be the Contractor's exclusive remedy.

§ 8.3.1.1 The Contractor further acknowledges and agrees that adjustments in the Contract Time will be permitted for a delay only to the extent such delay (1) is not caused or could not have been anticipated by the Contractor, (2) could not be limited or avoided by the Contractor's timely notice to the Owner of the delay or reasonable likelihood that a delay will occur, and (3) is of a duration of more than one (1) day.

§ 8.3.1.2 The Contractor's inability to secure sufficient personnel for the performance of the Work shall not constitute a basis for an extension of time. The Contractor shall not be entitled to an extension of time if the Architect or Construction Manager stops the Work due to the existence of or reasonable suspicion of a deficiency in the Work.

§ 8.3.1.3 An extension of the Contract Time, if requested by the Contractor, shall only be considered after the Contractor has made reasonable effort to recover the lost time. An extension, or extensions, of time may be granted subject to the provisions of this Article 8, but only after written application therefore by the Contractor. An extension of time shall be only for the number of days of delay which the Architect or Construction Manager may determine to be due solely to the causes set forth in the application for extension of time. The Contractor shall not be entitled to receive a separate extension of time for each one of several causes of delay operating concurrently; but if at all, only the actual period of delay as determined by the Construction Manager or Architect.

§ 8.3.1.4 All requests for additional time shall be made in writing, delivered to the Construction Manager within five (5) calendar days from the time when the circumstance with potential for delay becomes reasonably known to the Contractor, supported by documentation which demonstrates to the Architect and Construction Manager's satisfaction that the critical path of the Work has been significantly altered by the delays to the activities in question through no fault of the Contractor or anyone for whom the Contractor is responsible, and that the Project schedule cannot be maintained by re-ordering other activities within the Project at no cost. This request shall also contain, at a minimum, the following information: (1) date of start of delay; (2) specific cause of delay; (3) effect of delay on construction progress; and (4) date of termination of delay. Upon receipt of the Contractor's request for an extension of time, the Owner will ascertain the facts and extent of the delay, and may, in its sole discretion, extend the time for completion of the Contractor's Work when in its judgment such an extension is justified. The Owner's determination will be final and binding in any litigation commenced by the Contractor against the Owner which arises out of the Owner's denial of an extension of time to the Contractor. Any approval of an extension of the Contractor's time to complete its Work shall be memorialized by written change order, signed by the Owner, Contractor, Architect and Construction Manager. When the Owner determines that the Contractor will be granted an extension of time, such extension shall be computed in accordance with the following: for each day of delay in the completion of its Work, the Contractor shall be allowed one day of additional time to complete its Contract. The Contractor shall not be entitled to receive a separate extension of time for each one of several causes of delay operating concurrently; rather, only the actual period of delay as determined by the Owner or its Architect may be allowed.

§ 8.3.1.5 Failure of the Contractor to give written notice as required by Section 8.3.1.4 or to strictly comply with the requirements of Article 8 shall be deemed conclusively to be a waiver and release of such claim, and such notice shall be a condition precedent to the Contractor's right to make a claim for any claim arising out of, under or in connection with the Contractor or the performance of the Work.

§ 8.3.2 Notwithstanding anything to the contrary in the Contract Documents, an extension in the Contract Time, to the extent permitted and justified under Section 8.3.1, shall be the sole remedy of the Contractor for, and the Contractor waives its right to any claim for damages to the extent arising from, any (1) delay in the commencement, prosecution, or completion of the Work; (2) hindrance or obstruction in the performance of the Work; (3) loss of productivity or acceleration; or (4) other claims for disruption, interference, inefficiencies, impedance, hindrance, acceleration, resequencing, schedule impacts, lack of timeliness by the Owner or its consultants, and lack of coordination, errors or omissions in the design of the Project, cumulative impact of multiple change orders, unavailability of materials or equipment, delays in payment, and other delays and impacts (collective referred to herein as "Delay(s)"). In no event shall the Contractor be entitled to any compensation or recovery of any damages in connection with any Delay, including, but not limited to, delay costs, loss of productivity or efficiency, lost profits, extended jobsite general conditions and home office overhead, consequential damages, lost opportunity costs, impact damages, or other similar remuneration. The Owner's exercise of any of its rights or remedies under the Contract Documents (including, but not limited to, ordering changes in the Work, or directing suspension, rescheduling or correction of the Work), regardless of the extent or frequency of the Owner's exercise of such rights or remedies, shall not be construed as interference, hindrance or obstruction with the Contractor's performance of the Work and shall not entitle the Contractor to any additional compensation. The Contractor shall include a no-damages-for-delay clause in all subcontracts for the performance of the Work.

§ 8.3.3 Delays that affect the scheduled completion of the Work and are attributable to interference between Multiple Prime Contractors, Separate Contractors, Subcontractors, suppliers, utility companies or municipalities, shall be compensated solely by the granting of an extension of time to the Contractor by the Owner to complete the Work without charges to the Owner. The parties acknowledge that the Contract Time takes into account the time necessary for review of submittals and shop drawings, correcting design errors or omissions, coordination amongst other Contractors and Separate Contractors, change orders, delays incurred by seasonal limitations, work by utilities, and other administrative processing by all parties involved and are not compensatory. The Contractor agrees that it has included in its Bid prices the additional cost of doing work under this Contract caused by interference of the Architect, Construction Manager, other Contractors, Separate Contractors, Subcontractors, utility companies, etc. and the other non-compensatory Delays described above.

§ 8.3.4 When the Contract Time has been extended, as provided under Section 8.3, such extension of time shall not be considered as justifying extra compensation to the Contractor for administrative costs, home office, estimating, extended general conditions or other similar impact costs. The Contractor acknowledges that in agreeing to the Contract Sum it assessed the potential impact of the limitations in Section 8.3.2 on its ability to recover additional compensation in connection with a Work delay, interference, impact or hindrance and agrees that those limitations shall apply regardless of the accuracy of the Contractor's assessment or actual costs incurred by the Contractor.

§ 8.3.5 If the Contractor submits a progress report indicating, or otherwise expresses an intention to achieve, completion of the Work prior to any completion date required by the Contract Documents or expiration of the Contract Time, no liability of the Owner to the Contractor for any failure of the Contractor to so complete the Work shall be created or implied.

§ 8.3.6 The intent of the Contract is for Work to follow a logical sequence. The Contractor, however, may be required by the Owner, Construction Manager or Architect to temporarily omit or leave out any section of Work or perform Work out of sequence. Out of sequence work and come back time to these areas shall be performed at no additional cost to the Owner.

§ 8.3.7 Claims relating to Contract Time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.8 The Contractor understands that the timely prosecution of its obligations under the Contract is essential to the efficient completion of the Project and may have a direct bearing on the costs incurred by all other Contractors and Separate Contractors. The Contractor's obligations in this regard include, but are not limited to: 1) completing the Work in an orderly fashion and in accordance with an agreed upon progress schedule; 2) timely coordination and cooperation with the Owner, the Architect and the other Contractors and Separate Contractors to resolve disruptions, interferences or other problems as they arise; 3) providing sufficient personnel, systems and procedures to ensure

that required materials, supplies and skilled human resources are available so that the Work is timely understood, anticipated, progressed and communicated where required to others involved with the Project; 4) maintaining accurate job progress schedules and systems; 5) timely notifying others working on the site when delays or interferences occur that will affect the Contractor's or other's work pertaining to the Project; 6) providing a skilled, informed and properly supported superintendent at the Project sites and at all required job meetings to provide meaningful information and commitments to efficiently cooperate in coordinating the work of the various contractors; and 7) timely reviewing all job minutes, correspondence and other communications and responding to same when required.

§ 8.3.9 The Contractor agrees that its failure to timely cooperate and proceed can substantially increase the costs of other Contractors and Separate Contractors in attempting to timely prosecute their obligations under related contracts. Accordingly, the Contractor recognizes that other Contractors and Separate Contractors on the site are third-party beneficiaries of the Contractor's obligation to timely coordinate and prosecute its obligations under the Contract Documents. The Contractor hereby waives and shall not raise as a defense the absence of privity of contract between the Contractor and the other Contractors and Separate Contractors in any claim hereafter asserted by other Contractors or Separate Contractors to recover costs or damages for delay or interference and shall be responsible to other Contractors and Separate Contractors on the site for damages caused by the Contractor's failure to timely and properly perform its contractual obligations under the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. Notwithstanding anything to the contrary contained in the Contract Documents, the Owner may withhold or offset any payment to the Contractor if and for so long as the Contractor fails to perform any of its obligations under any of the Contract Documents; provided, however, that any such holdbacks shall be limited to an amount sufficient in the reasonable opinion of the Owner to cure any default or failure of performance by the Contractor.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

§ 9.2.1 Within 15 days of Contract Award, the Contractor shall submit to the Construction Manager a schedule of values allocated to various portions of the Work for each building, prepared in the currently authorized form of AIA Document G703 – Continuation Sheet and supported by such data to substantiate its accuracy as the Construction Manager and Architect may require. This schedule, unless objected to by the Construction Manager or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. The schedule of values shall state the names of all Subcontractors, Sub-subcontractors and material suppliers and the amounts to become due to each breakdown by specification section. The schedule of values shall contain, along with individual work items, separate line items for (1) mobilization, bonds, insurance, etc., (2) value of administrative close out submittals, (3) Allowance(s) if required elsewhere in the Project Manual, (4) separate subtotals by building, and (5) buildings further separated between "Additions/New Construction" and "Renovations/Reconstruction" as applicable. At the direction of the Architect, it shall include quantities, if applicable. The total for all items shall aggregate the Contract Sum.

§ 9.2.2 Any schedule of values that fails to include sufficient detail, is unbalanced or exhibits "front loading" of the value of the Contractor's Work will be rejected. Furthermore, if the schedule of values has been approved by the Construction Manager and the Architect and is subsequently used, but later is found by the Construction Manager or Architect to be improper for any reason, sufficient funds shall be withheld from the Contractor's future applications for payment to ensure an adequate reserve (exclusive of normal retainage) to complete the Contractor's Work.

§ 9.2.3 For each item, the value of labor shall be listed separately from the value of materials and other costs. All items within the schedule shall be of the same order of magnitude. The Schedule of Values shall contain line items in equal amounts allocated to initial project requirements (i.e., 1% bonds, 1% insurance, 1% mobilization, 1% general requirements, etc.) and final project requirements (i.e., 1% for demobilization, 1% punch lists, 1% final cleaning, 1% as-built drawings and 1% O&M Manuals). Profit and overhead shall be included in each item. Included with this schedule shall be a cash flow projection upon which the Owner will be entitled to rely for the purpose of making adequate funds available for the Work.

§ 9.3 Applications for Payment

§ 9.3.1 In accordance with Article 5 of the Agreement and the Payment Procedures in the Specifications, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, notarized and reflecting retainage as provided elsewhere in the Contract Documents. Applications for Payment will be in the currently authorized form of AIA Document G732 - 2019, "Application and Certificate for Payment," accompanied by AIA Document G703-1992, "Continuation Sheet," and must include (add and/or deduct) adjustments to the Contract Sum resulting from Work performed under approved Change Orders (specified under Article 7) and shall be shown separately on the application for previous and current periods. Each Application for Payment shall be prepared in such form and supported by such data to substantiate the Contractor's right to payments as the Owner and/or Architect may require such as copies of requisitions from Subcontractor and material suppliers. Each Application for Payment forwarded to the Owner by the Architect shall be subject to audit and approval by the Owner in accordance with the Owner's normal audit procedures. The Application for Payment must be accompanied by: (a) a current Contractor's lien waiver; (b) duly executed waivers of public improvement liens from all Subcontractors and material suppliers representing satisfaction of payment of all amounts requested by the Contractor on behalf of such entities in any previous application for payment; (c) certified payroll for all employees of the Contractor and employees of Subcontractors performing Work on the Project; (d) for contracts of $250,000 and more, all Contractors and Subcontractors must attach a copy of proof of completion of the OSHA 10 course to the first Certified Payroll submitted and on each succeeding payroll where any new or additional employee is first listed; and (e) such other information which the Owner, Construction Manager or Architect request the Contractor furnish in connection with its Application for Payment.

§ 9.3.1.1 The Construction Manager and Architect shall review the application for payment submitted by the Contractor and shall advise the Contractor of any adjustments to be made thereto. The Construction Manager and/or the Architect may make such adjustments under the circumstances set forth in Section 9.5.1. If any such adjustments are made by the Architect or Construction Manager, the Contractor shall submit an original itemized revised application with all documentation required by Section 9.3.1.

§ 9.3.1.2 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Construction Manager and Architect, but not yet included in Change Orders.

§ 9.3.1.3 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.1.4 Until Substantial Completion, the Owner shall pay ninety-five percent (95%) of the amount due the Contractor on account of progress payments, less an amount necessary to satisfy any claims, liens, or judgments against Contractor, which have not been suitably discharged. In accordance with Section 9.8.5, the Owner shall pay the entire amount retained from previous progress payments less two (2) times the amount required to complete items identified in a list prepared in accordance with Section 9.8.2 and the amount required to satisfy any outstanding claims, liens, or judgments against the Contractor.

§ 9.3.1.5 The Contractor and its Subcontractors are required to submit certified payroll information to the Owner in accordance with New York State Law.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the Project site for subsequent incorporation in the Work. If approved in advance in writing by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest. The costs of applicable insurance, storage, and transportation to the site for such materials and equipment stored off the site shall not increase the Contract Sum.

§ 9.3.2.1 Payment may be made for materials and equipment delivered and suitably stored on-site for future incorporation in the Work, subject to the following conditions:

.1 Request for payment shall be considered for material or equipment, which is in short or critical supply, which has been specially fabricated for the Project or, at the discretion of the Construction Manager and Architect, for other materials or equipment.

.2 A request for payment of material stored on-site must be made by the Contractor 10 days prior to actual, monthly cut-off date for Payment Applications.

.3 Procedures required by the Owner shall include, but not necessarily limited to, submission by the Contractor to the Construction Manager and Architect of bills of sale and bills of lading for such materials and equipment, provisions of opportunity for the Construction Manager's and Architect's visual verification that such materials and equipment are in fact in storage; and, if stored off-site, submission by the Contractor of verification that such materials and equipment are stored in a bonded warehouse.

.4 All such materials and equipment, including materials and equipment stored on-site but not yet incorporated into the Work, upon which partial payments have been made shall become the property of the Owner, but the care and protection of such materials and equipment shall remain the responsibility of the Contractor until incorporation into the Work and accepted by the Owner at substantial completion, including maintaining insurance coverage on a replacement cost basis without voluntary deductible.

§ 9.3.2.2 Payment may be made for materials and equipment delivered and suitably stored off-site for future incorporation in the Work, subject to the following conditions:

.1 The Contractor shall submit: a written validation by the Owner, Construction Manager or Architect that such materials are stored safely off site, in the quantities and condition stated by the Contractor; a copy of an invoice for the material and equipment; a bill of sale or equivalent indication of the quantity and value of the material or equipment; a written statement indicating the location and method of storage; and property insurance certificate or rider covering the specific material or equipment, which shall name the Owner as an additional insured party.

.2 The Contractor shall submit a verification that such materials and equipment are stored in a bonded warehouse.

.3 A request for payment of material stored off-site must be made by the Contractor 10 days prior to actual, monthly cut-off date for Payment Applications.

.4 All such materials and equipment upon which partial payments have been made shall become the property of the Owner, but the care and protection of such materials and equipment shall remain the responsibility of the contractor until incorporation into the Work and accepted by the Owner at substantial completion, including maintaining insurance coverage on a replacement cost basis without voluntary deductible.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.3.3.1 Notwithstanding such transfer of title, the Contractor shall have the full continuing responsibility to install materials and equipment, protect and maintain the Work, materials and equipment in proper condition and forthwith repair, replace and make good any damage thereto without cost to the Owner until such time as the Work covered by the Contract is fully accepted by the Owner. Such transfer of title shall in no way affect any of the Contractor's obligations under the Contract. In the event that after title has passed to the Owner, any such Work, supplies, materials and equipment are rejected as being defective or otherwise unsatisfactory, title to all such items shall be deemed to have been transferred back to the Contractor.

§ 9.3.4 The Contractor further expressly undertakes to defend the Indemnitees (as defined previously in Section 3.18), at the Contractor's sole expense, against any actions, lawsuits or proceedings brought against Indemnitees as a result of liens filed against the Owner, the Work, the site of any of the Work, the Project site and any improvements thereon, payments due the Contractor or any portion of the property of any of the Indemnities (referred to collectively as liens in this Section 9.3.4). The Contractor hereby agrees to defend, indemnify, and hold Indemnitees harmless against any such liens or claims of lien and agrees to pay any judgment or lien resulting from any such actions, lawsuits, or proceedings.

§ 9.3.5 The Owner shall release any payments withheld due to a lien or a claim of lien if the Contractor obtains security acceptable to the Owner or a lien bond which is: (1) issued by a surety acceptable to the Owner, (2) in form and substance satisfactory to the Owner, and (3) in an amount not less than One Hundred Fifty percent (150%) of such lien claim. By posting a lien bond or other acceptable security, however, the Contractor shall not be relieved of any responsibilities or obligations under this Section 9.3, including, without limitation, the duty to defend and indemnify the Indemnities in an action on the lien, lien discharge bond or underlying debt. The cost of any premiums incurred in connection with such bonds and security shall be the responsibility of the Contractor and shall not be part of, or cause any adjustment to, the Contract Sum.

§ 9.3.6 Notwithstanding the foregoing, the Owner reserves the right to settle any disputed public improvement lien claim by payments to the lien claimant or by such other means as the Owner, in the Owner's sole discretion, determines is the most economical or advantageous method of settling the dispute. The Contractor shall promptly reimburse the Owner, upon demand, for any payments so made.

§ 9.4 Certificates for Payment

§ 9.4.1 The Construction Manager will, within seven (7) days after the Construction Manager's receipt of the Contractor's Application for Payment, review the Application, certify the amount the Construction Manager determines is due the Contractor, and forward the Contractor's Application and Certificate for Payment to the Architect. Within seven (7) days after the Architect receives the Contractor's Application for Payment from the Construction Manager, the Architect will either issue to the Owner a Certificate for Payment, with a copy to the Construction Manager, for such amount as the Architect determines is properly due, or notify the Construction Manager and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1. The Construction Manager will promptly forward to the Contractor the Architect's notice of withholding certification.

§ 9.4.2 Where there is more than one Contractor performing portions of the Project, the Construction Manager will, within seven (7) days after the Construction Manager receives all of the Contractors' Applications for Payment: (1) review the Applications and certify the amount the Construction Manager determines is due each of the Contractors; (2) prepare a Summary of Contractors' Applications for Payment by combining information from each Contractor's application with information from similar applications for progress payments from the other Contractors; (3) prepare a Project Application and Certificate for Payment; (4) certify the amount the Construction Manager determines is due all Contractors; and (5) forward the Summary of Contractors' Applications for Payment and Project Application and Certificate for Payment to the Architect.

§ 9.4.2.1 Within seven (7) days after the Architect receives the Project Application and Project Certificate for Payment and the Summary of Contractors' Applications for Payment from the Construction Manager, the Architect will either (1) issue to the Owner a Project Certificate for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Project Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Project Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward the Architect's notice of withholding certification to the Contractors.

§ 9.4.3 The Construction Manager's certification of an Application for Payment shall be based upon the Construction Manager's evaluation of the Work and the information provided as part of the Application for Payment. The Construction Manager's certification will constitute a representation that, to the best of the Construction Manager's knowledge, information and belief, the Work has progressed to the point indicated and the quality of the Work is in accordance with the Contract Documents. The certification will also constitute a recommendation to the Architect and Owner that the Contractor be paid the amount certified.

§ 9.4.4 The Architect's issuance of a Certificate for Payment shall be based upon the Architect's evaluation of the Work, the recommendation of the Construction Manager, and information provided as part of the Application for Payment. The Architect's certification will constitute a representation that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated, that the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified.

§ 9.4.5 The representations made pursuant to Sections 9.4.3 and 9.4.4 are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and

inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Construction Manager or Architect.

§ 9.4.6 The issuance of a separate Certificate for Payment or a Project Certificate for Payment will not be a representation that the Construction Manager or Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed the Contractor's construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Construction Manager or Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Construction Manager's or Architect's opinion the representations to the Owner required by Section 9.4.4 and 9.4.5 cannot be made. If the Construction Manager or Architect is unable to certify payment in the amount of the Application, the Construction Manager will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor, Construction Manager and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Construction Manager or Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence or subsequent observations, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Construction Manager's or Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from the acts and omissions described in Section 3.3.2 because of

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- **.5** damage to the Owner, another Prime Contractor or a Separate Contractor;
- **.6** reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
- **.7** failure to carry out the Work in accordance with the Contract Documents;
- **.8** receipt by the Owner of a notice of withholding from the New York State Department of Labor or other administrative agencies having jurisdiction over the Project;
- **.9** failure to comply with applicable federal, state or local statutes, regulations, and/or laws, including, without limitation, laws and regulations applicable to the provision of certified payrolls;
- **.10** failure of the Contractor to provide executed performance and payment bonds and a current certificate of insurance and endorsements;
- **.11** reasonable evidence that the Work has not progressed as indicated on the Application for Payment;
- **.12** damages caused to the Owner, Construction Manager, the Architect or another Contractor as a result the Contractor's performance of its Work;
- **.13** the Architect's and/or the Construction Manager's discovery or observation of work which has been previously paid for by the Owner which is defective and/or incomplete;
- **.14** The amount requested exceeds the percent completion of Work on the site; or
- **.15** breach of this Agreement.

Notwithstanding the extent to which the Construction Manager and/or Architect certify an Application for Payment, the Owner shall have the right to withhold payment, in whole or in part, should the Owner determine that any of the grounds for withholding certification set forth in this Section 9.5.1 do in fact exist. If the Owner withholds payment, in whole or in part, the Owner shall promptly provide to the Contractor, Architect and Construction Manager a written explanation of the reason(s) for which payment is withheld and shall promptly pay, in accordance with the Contract Documents, all amounts which are not in dispute.

§ 9.5.2 If the Contractor disputes any determination by the Owner, Construction Manager or Architect with regard to any Certificate for Payment or in the event of a bona fide dispute between the Contractor and Owner, the Contractor nevertheless shall expeditiously continue to prosecute the Work and may submit a Claim in accordance with Article 15.

§ 9.5.3 When the above reasons for withholding certification or the Owner's withholding of payment are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect or Construction Manager withholds certification for payment under Section 9.5.1, or if the Owner otherwise deems it necessary to protect its interests or the interests of the Project, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Construction Manager and both will reflect such payment on the next Certificate for Payment.

§ 9.5.5 Notwithstanding anything above to the contrary, the Owner has the right to withhold payment to the Contractor to protect itself against damages incurred or which may be incurred as a result of the Contractor's breach or negligence, including, but not limited to, the items set forth in Section 9.5.1. With respect to any liens, claims, or other circumstances for which the Owner is entitled to withhold payments pursuant to decisions by the Architect pursuant to Section 9.5.1, the Owner shall be entitled to withhold a sum equal to twice the stated amounts of such liens or claims, or, where there is no stated amount, twice the amount determined by the Architect to be necessary to protect the interests of the Owner. The Owner will release payments withheld due to liens provided that the Contractor obtains a discharge of record of such lien, by bonding or otherwise. By posting a lien discharge bond, however, the Contractor shall not be relieved of any responsibilities or obligations under the Agreement, including, without limitation, the duty to defend, indemnify, and hold harmless the Indemnitees (as defined previously in Section 3.18). The cost of any premiums or other expenses incurred in connection with such bonds or other means of discharge of record shall be the sole responsibility of the Contractor and shall not be part of, or cause any adjustment to, the Contract Sum.

§ 9.5.6 If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to the Contract, including but not limited to these General Conditions, such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained herein to the contrary, if the Contractor fails to promptly make any payment due the Owner, or the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective work, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner's sole discretion, elect either to: (1) deduct an amount equal to that which the Owner is entitled from any payment then or thereafter due the Contractor from the Owner, or (2) issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

§ 9.5.7 If the Contractor disputes any determination by the Owner, Construction Manager or Architect with regard to any Certificate for Payment, or in the event of a bona fide dispute between the Contractor and the Owner, the Contractor nevertheless shall expeditiously continue to prosecute the Work.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents unless such requisition is not in accordance with the terms of the Contract Documents, and shall so notify the Construction Manager and Architect.

§ 9.6.2 Payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held in trust by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contracts with the Contractor for which payment was made by the Owner. The Contractor shall strictly comply with any common law, statutory, or decisional law trust fund requirements in the State of New York (including, without limitation, the requirements of New York Lien Law Article 3-A), and hereby agrees that the Owner has the same rights as any beneficiary of such trusts to examine the books and records of the Contractor to determine such compliance, from time to time at the Owner's sole discretion. The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in similar manner.

§ 9.6.2.1 Within seven (7) days of receipt of a payment from the Owner, the Contractor shall pay each of its Subcontractors and suppliers for work performed and materials furnished by them as reflected in the payment from the Owner, less an amount necessary to satisfy any outstanding claims, liens, or judgments and less a retained amount of not more than 5%, except that the Contractor may retain not more than 10% provided that prior to

entering into a Subcontract with the Contractor, the Subcontractor is unable or unwilling to provide a performance bond and labor and material payment bond both in the full amount of the subcontract at the request of the Contractor. The Contractor shall not retain portions of the proceeds owed any Subcontractor or supplier from the Owner's payment to the Contractor for the "contract balance." Similar provisions apply to the Subcontractor and/or supplier paying each of its Subcontractors and suppliers. Nothing in this Section shall create in the Owner any obligation to pay, or to ensure that the Contractor pays, any Subcontractor or supplier, or any relationship in contract or otherwise, implied or expressed, between any Subcontractor or supplier and the Owner. The Contractor agrees that it shall comply with the payment requirements of Section 106-b(2) of the New York General Municipal Law, as amended, and that to the extent there is any conflict between that statutory section and the provisions of this Section 9.6.2.1, the provisions of the statute shall prevail.

§ 9.6.3 The Construction Manager will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Owner, Construction Manager and Architect on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven (7) days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Construction Manager nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to its suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 Failure of Payment

If, through no fault of the Contractor, the Construction Manager and Architect do not issue a Certificate for Payment within 30 days of the Construction Manager's receipt of the Contractor's Application for Payment or if, through no fault of the Contractor, the Owner does not pay the Contractor the amount certified by the Construction Manager and Architect, subject to the Owner's right to withhold payment under the terms of the Contract Documents, within 30 days of the date established for such payment in the Contract Documents, then the Contractor may, upon seven (7) additional days' written notice and opportunity to cure to the Owner, Construction Manager and Architect, stop the Work until payment of the amount owing has been received. To the extent it is determined that payment to the Contractor was improperly held through no fault of the Contractor and the Contractor elected to stop its Work consistent with the procedure set forth in this Section, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up as provided for in the Contract Documents. However, if the Contractor stops its Work and it is determined that the Owner had the right to withhold payment under the terms of the Contract Documents, then the Contractor shall be responsible to the Owner for all costs and damages (including attorneys' fees) arising from such stoppage of Work and the Contractor shall not be entitled to any adjustment in the Contract Sum or the Contract Time. This Section shall not apply: (a) to the extent that the Contractor owes to the Owner any amount pursuant to the provisions of this Contract, or (b) to the extent the Owner is required to expend amounts to purchase additional insurance on behalf of the Contractor to meet the insurance requirements of this Agreement.

§ 9.8 Substantial Completion

§ 9.8.1 The date of Substantial Completion of the Project or a designated portion thereof is the date when construction is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the entire Project (or such portion thereof as Owner earlier elects to occupy or utilize) for the use for which it is intended. Minor items of completion or correction ("Punch List Work") may be performed after Substantial

Completion, provided that such items can and shall be performed at such times and in such manner that such Work does not unreasonably interfere with the Owner's occupancy and use of the Project. Substantial Completion shall not be deemed to exist until (a) the Owner receives a Certificate of Occupancy for the Project (or such portion as elected by Owner) if such Certificate of Occupancy is required, and any other permits, approvals, licenses and any other documents from governmental authorities having jurisdiction therefore necessary for the beneficial occupancy of the Project and (b) the Contractor, Construction Manager, Architect and Owner have agreed upon a schedule for final completion and to provide the Owner with all as-built drawings, operating manuals, warranties and other required closeout documents. Warranties called for by the Agreement or by the Drawings and Specifications shall commence on the date of Substantial Completion of the Project or designated portion thereof, or any later date that the parties agree. This date shall be established by a Certificate of Substantial Completion signed by the Owner, Contractor, Architect and Construction Manager.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall notify the Construction Manager, and the Contractor and Construction Manager shall jointly prepare and submit to the Architect a comprehensive list which shall identify all non-conforming, defective and incomplete Work and establish the date of commencement of warranties in connection with any such Work. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the list, the Architect, assisted by the Construction Manager, will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the list, which is not sufficiently complete in accordance with the requirements of the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Construction Manager or Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect, assisted by the Construction Manager, to determine Substantial Completion. If the Architect and the Construction Manager are required to perform additional substantial completion inspections because the Work fails to be substantially complete, the amount of compensation paid to the Architect and the Construction Manager by the Owner for additional services shall be deducted from the final payment to the Contractor.

§ 9.8.4 When the Architect, assisted by the Construction Manager, determines that the Work or designated portion thereof is substantially complete, the Construction Manager will prepare, and the Construction Manager and Architect shall execute a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all Punch List Work, which timeframe shall not exceed 30 days. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.8.5.1 In conformance with New York General Municipal Law Section 106-b(1)(a), upon proper execution of Certificate of Substantial Completion of Work, the Contractor shall submit a requisition for payment of the remaining amount of the Contract Sum. Upon certification of payment by the Architect, the Owner will approve and promptly pay the remaining amount of the Contract Sum less two times value of any remaining items to be completed or corrected and less an amount necessary to satisfy any claims, liens or judgments against Contractor which have not been suitably discharged. Such payment shall be made under terms and conditions governing final payment except that the Owner's making of such payment shall not constitute the Owner's waiver of any objection to all or any portion of the Work performed by the Contractor or any claims the Owner may then have against the Contractor.

§ 9.8.5.2 Neither the requisition for payment stipulated in Section 9.8.5.1 nor any portion of retained percentage shall become due until the Contractor submits to the Construction Manager:

.1 an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the work for which the Owner or the Owner's property might in any way be responsible, have been

paid or otherwise satisfied, the form of which will be the currently authorized AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims";

.2 consent of all sureties, if any, to such payment, the form of which will be the currently authorized AIA Document G707A, "Consent of Surety to Reduction in or Partial Release of Retainage," but which will not be required if the amount withheld under Section 9.8.3.1 exceeds the amount of retainage;

.3 if required by the Owner, other data establishing payment or satisfaction of all such obligations, such as receipts, releases, and waivers of liens arising out of contract to such extent and in such form as may be designated by the Owner; and

.4 all required closeout documents.

§ 9.8.5.3 As the Punch List Work is satisfactorily completed or corrected, the Contractor may submit a requisition for payment of these items. The Contractor shall submit with each such requisition for payment affidavits, consents of surety, and other data as described in Section 9.8.5.2 covering work for which payment is requested. Upon certification of such requisitions by the Architect and Construction Manager, the Owner will approve and promptly pay the requisition less an amount two times that which is necessary to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged.

§ 9.8.5.4 Where the Project includes heating, air conditioning, electrical, communication, data or other systems which are not put into operation at the time of occupancy, a sum shall be withheld until these systems have operated to the general satisfaction of the Architect. The Contractor shall provide complete start up and commissioning of the systems with a detailed check list as recommended by the equipment or system manufacturer. The retained amount shall approximate five percent (5%) of the cost of the systems as determined by the cost breakdown submitted. The guaranty/warranty period for such systems will not commence until after such Architect approval.

§ 9.8.5.5 The Contractor shall complete the Punch List Work for the Project no later than 30 days after Substantial Completion of the Project. The Contractor shall be fully liable to the Owner for all damages suffered by the Owner as a result of delay in achieving final completion of the Work, including without limitation, additional architectural and construction management fees related to extended services.

§ 9.8.5.6 No partial payments will be made after the time fixed for the completion of the Work or the time to which completion may be extended under the terms of the Contract, until the full and final completion and acceptance of all Work herein agreed upon.

§ 9.8.6 If the Architect or the Construction Manager is required to inspect the Work more than two (2) times prior to certifying the Work as being substantially complete on account of the discovery of one or more items that are not sufficiently complete, the Contractor shall be liable to the Owner for the amount of any costs, additional fees or compensation due from or paid by the Owner to the Architect and/or the Construction Manager for the additional inspections.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor and Construction Manager shall jointly prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect after consultation with the Construction Manager.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Construction Manager, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.9.4 The Contractor shall cooperate with the Owner in order to make portions of the Project available as soon as possible.

§ 9.9.4.1 The Project site and buildings, whether work of the Contractor is partially or fully completed or not, are property of the Owner who shall have certain rights and privileges in connection with use of same.

§ 9.9.4.2 Should there be, in the opinion of the Architect or Construction Manager, unwarranted delay on part of any Contractor in completion of incomplete or defective work or other Contract requirements, and the Architect so certifies, the Owner may have full or partial use and occupancy of any or all portions of buildings as required for moving in or installing furniture, fixtures, supplies, or equipment and for general cleaning and maintenance work. In such event, the Contractor whose unfinished work is done subsequent to installation of furniture, fixtures, equipment, etc., shall be responsible for the prevention of any damage to such installation. Such use or occupancy by the Owner shall in no instance constitute acceptance of any of the Work.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon completion of the Work, the Contractor shall forward to the Construction Manager a written notice that the Work is ready for final inspection and acceptance and shall also forward to the Construction Manager a final Contractor's Application for Payment. Upon receipt, the Construction Manager will evaluate the completion of Work of the Contractor and then forward the notice and Application, with the Construction Manager's recommendations, to the Architect who will promptly make such inspection. When the Architect, finds the Work acceptable under the Contract Documents and the Contract fully performed, the Construction Manager and Architect will promptly issue a final Certificate for Payment or Project Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Construction Manager's and Architect's final Certificate for Payment or Project Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.1.1 If the Work is not accepted by the Owner after final inspection and additional time is required to complete items identified during the final inspection, the date starting the two-year correction period described in Article 12.2 shall be set by the Architect at his discretion, but not later than the date of the final Certificate for Payment.

§9.10.1.2 If the Architect and the Construction Manager are required to provide additional services, extend the duration of services to the Owner, and/or perform additional final inspections because the Work fails to comply with the requirements of the Contract Documents, or the Contractor did not complete the Work in accordance with the construction schedule or Project Schedule, the amount of compensation paid to the Architect and the Construction Manager by the Owner for additional services shall be deducted from the final payment due to the Contractor.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect through the Construction Manager (1) all closeout documents required by the Contract Documents, including, without limitation, as-built drawings, attic stock, maintenance manual, operating instructions and other documents required to be delivered under the Contract in connection with the Work in the form required by the Owner, (2) confirmation that all start-up, testing, balancing and commissioning of systems, equipment and other materials has been successfully completed as required by the Contract Documents, (3) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (4) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (5) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (6) consent of surety, if any, to final payment, (7), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner, and (8) all warranties and guarantees required by the Contract Documents. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien

remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.2.1 In addition to the submittals required in Section 9.10.2 above, the Contractor shall submit separate final release or waivers of lien for each Subcontractor, material supplier, or others with lien rights against the Project, and shall submit a list of such parties.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Construction Manager and Architect so confirm, the Owner shall, upon application by the Contractor and certification by the Construction Manager and Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect through the Construction Manager prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment by the Owner shall not constitute a waiver of claims, causes of action, damages or complaints by the Owner.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing in accordance with Article 15 and identified by that payee in writing as unsettled at the time of the final Application for Payment.

§ 9.10.6 At any time a lien is filed against the Project funds, the Owner may demand that the Contractor discharge said lien, through bonding or otherwise, and the Contractor must obtain the discharge of said lien within seven (7) days of such demand at the Contractor's sole cost and expense, and at no cost to the Owner. If any lien or other encumbrance required to be removed at the Contractor's sole cost and expense pursuant to this Section is not discharged of record as aforesaid, the Owner shall have the right to take such action as the Owner shall deem appropriate (which shall include the right to cause such lien or other encumbrance to be canceled and discharged of record), and in such event, all costs and expenses incurred by the Owner in connection therewith (including, without limitation, premiums for any bond furnished in connection therewith, and reasonable attorneys' fees, court costs and disbursements), shall be paid by the Contractor to the Owner on demand or, at the option of the Owner, deducted from any payment then due or thereafter becoming due from the Owner to the Contractor in accordance with the provisions of these General Conditions.

§ 9.10.7 Existing warranties shall not deprive the Owner of any cause of action, right, or remedy otherwise available for breach of any of the provisions of the Contract Documents. The periods referred to above shall not be construed as limitations on the time in which the Owner may pursue any such action, right or remedy.

§ 9.10.8 The Contractor shall achieve final completion of all Work, including, without limitation, correction of punch-list items, preparation and delivery of all manuals, presentation of training and completion of final paper submissions not later than 30 days following the date of Substantial Completion. In the event the Contractor shall fail to achieve final completion of the Work within such a period of time, the Contractor and the Contractor's surety, if any, shall be liable for and shall reimburse the Owner for any and all fees paid to the Architect and Construction Manager and other expenses made necessary by the Contractor's failure. Additional fees and expenses shall be charged by the Owner against any Final Payment due or which may become due to the Contractor, and the Contractor shall promptly pay or refund the Owner the excess, if any, upon the Owner's written request.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, implementing, directing, controlling, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall submit the Contractor's safety program to the Construction Manager for review and coordination with the safety programs of other Contractors. The Construction Manager's responsibilities for review and coordination of safety programs shall not extend to direct control over or charge of the acts or omissions of the Contractors, Subcontractors, agents or employees of the Contractors or Subcontractors, or any other persons performing portions of the Work and not directly employed by the Construction Manager. The Contractor's safety precautions and programs shall include

specific steps designed to minimize the risk of contracting or spread of COVID-19, including provision of all appropriate personal protective equipment, social distancing, avoiding stacking of trades, and other reasonable precautions.

§ 10.1.1 Prior to beginning any Work, the Contractor shall submit a copy of its corporate safety plan to the Owner and the Construction Manager. Two (2) weeks after receipt of the Notice to Proceed, the Contractor shall provide a site safety logistics plan to the Construction Manager. The site safety logistics plan should minimally include locations of the temporary fence and gates, traffic plans for deliveries and removals, refuse container locations, crane locations, pick locations, boom radium, and lift locations, stockpiles, toilet locations, site water and power locations, and safety. This plan shall also show the location of all staging and storage areas, clearly separating construction and school areas. The logistical information represented by the construction documents shall serve as a minimal guide. The Contractor is required to submit its corporate safety policy within ten (10) days of receipt of the Notice to Proceed. Said policy must minimally meet OSHA standards and define details concerning the maintenance of a safe work environment. The Contractor shall make the participation of its Subcontractors in its safety program mandatory. A list of key personnel, with addresses and telephone numbers for emergency purposes shall be forwarded to the Construction Manager and Architect. The Owner and the Construction Manager shall establish a fire coordination procedure and shall provide same to the Contractor for its use during the performance of its Work.

§ 10.1.2 The Contractor shall provide its own COVID-19 Safety Plan to the Owner prior to the start of the Work. The Contractor shall designate a person on its staff to be responsible for monitoring the wearing of PPE by each person on site working with or for the Contractor. The Contractor shall strictly follow and ensure that its Subcontractors follow the Contractor's COVID-19 Safety Plan as well as all applicable Center for Disease Control guidelines and federal, state and local orders and directives.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take necessary precautions for safety of, and shall provide reasonable protection to prevent damage, injury, infection or exposure to COVID-19, or loss to

- **.1** employees on the Work and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor;
- **.3** the Owner's real and personal property and other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction;
- **.4** construction or operations by the Owner, Separate Contractors, or other Contractors; and
- **.5** the existing buildings and premises in the vicinity of or affected by the Contractor's operations.

§ 10.2.1.6 Safe access to and egress from any building under construction as part of this Contract, or any existing building in which Work is being done under this Contract, shall be maintained and remain unencumbered by the Contractor in accordance with all applicable codes, rules and regulations of authorities having jurisdiction on the Work. The Contractor and its Subcontractors shall cooperate in maintaining this condition. Roadways, paths, walks, exits, service drives and other areas shall remain unobstructed and shall be maintained in a safe and satisfactory condition, for all persons using the building and premises. Materials shall not be stored promiscuously about the site or in the building, but shall be carefully stored in areas which will not interfere with pedestrian traffic or with access to and egress from adjacent properties and use of the building. The Contractor shall provide and maintain such temporary Work as may be required for the protection of its finished Work where liable to injury. The Contractor will be responsible for all of its Work, materials and equipment that may be damaged or stolen during the duration of the Contract and until the Work is accepted by the Owner. The Contractor shall make good any such damage or loss without expense to the Owner. The Contractor shall not permit unnecessary hazards to be created nor permit them to continue if they are discovered. The Contractor's storage and staging areas shall be only in locations assigned or approved by the Owner and Architect and may be required to be relocated by the Contractor as building occupancy or use changes during the course of the Work. This relocation will be done by the Contractor at no additional cost to the Owner.

§ 10.2.2 The Contractor shall comply with, and give notices required by, applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.2.1 The Contractor acknowledges that the Labor Law of the State of New York, and regulations adopted thereunder, place upon both the Owner and the Contractor certain duties and that liability for failure to comply

therewith is imposed on both the Owner and the Contractor regardless of their respective fault. The Contractor hereby agrees that, as between the Owner and the Contractor, the Contractor is solely responsible for compliance with all such laws and regulations imposed for the protection of persons performing the Contract. The Contractor shall indemnify and hold harmless the Owner of and from any and all liability for violation of such laws and regulations and shall defend any claims or actions which may be brought against the Owner as the result thereof. In the event that the Contractor shall fail or refuse to defend any such action, the Contractor shall be liable to the Owner for all costs of the Owner in defending such claim or action and all costs of the Owner, including attorney's fee, in recovering such defense costs from the Contractor.

§ 10.2.2.2 All laborers, workers, and mechanics employed in the performance of the Work of this Project shall be certified as having successfully completed a course in construction safety and health approved by the United States Department of Labor's Occupational Safety and Health Administration that is at least 10 hours in duration. The Contractor and its Subcontractors shall conduct their operation in accordance with the Safety Guides for Construction as issued by State Education Department, and the Contractor's safety program.

§ 10.2.2.3 All safety equipment including hard hats, weather protective gear and PPE required for the Contractor to perform its Work are to be supplied by the Contractor or its Subcontractors. Within the designated construction areas, the Contractor's employees, superintendents, or other agents, and its Subcontractors, employees, superintendents, or other agents are required to wear hard hats and other required or essential safety equipment. Each person seen without a hard hat, or otherwise failing to comply with this requirement, will be ordered to leave the Project. No prior warnings will be given by the Owner, Construction Manager or Architect. The Contractor and its Subcontractors shall be solely responsible for making up and paying for any loss of production or required progress resulting from the removal of personnel from the Project as set forth herein including any costs incurred by the Owner in connection with the work of other Contractors.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.4.1 When use or storage of explosives, or other hazardous materials, substances or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall give the Owner reasonable advance notice.

§ 10.2.4.2 If the Contract Documents require the Contractor to handle materials or substances that under certain circumstances may be designated as hazardous, the Contractor shall handle such materials in an appropriate manner.

§ 10.2.5 The Contractor shall promptly remedy damage and loss to property referred to in Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4, except damage or loss attributable to acts or omissions of the Owner, Construction Manager or Architect or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18, and shall not be limited by such damage or loss being insured under property insurance required by the Contract Documents.

§ 10.2.6 The Contractor shall schedule weekly safety meetings and each of its Subcontractors must be properly represented at such meetings. The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner, Construction Manager and Architect.

§ 10.2.7 The Contractor shall not load or permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition. The Contractor shall not load any part of the Work with materials, equipment, shores, bracing, or other items which in any way could cause damage to the Work or to other Work or could endanger persons in or about the Work.

§ 10.2.8 If, during the construction, public or private property is damaged or destroyed as a consequence of its Work, the Contractor shall, at its own expense, restore such property to a condition equal to that existing before such damage or injury was done, by repairing, rebuilding or replacing it, or otherwise making good such damage or destruction in an acceptable manner.

§ 10.2.9 The Contractor shall be responsible for all breakage of glass, which has been furnished and installed as part of Contract and existing glass that is broken due to operations under the Contract for Work. No matter by whom or what cause glass was broken, the Contractor shall replace all broken glass before completion and acceptance of the Contractor's Work.

§ 10.2.10 In addition to all requirements set forth herein, the Contractor and its Subcontractors shall fully comply with the provisions of the federal Occupational Safety and Health Act of 1970, as amended, and with any rules and regulations pursuant to the Act. This requirement shall apply continuously and not be limited to normal working hours.

§ 10.2.11 The Contractor shall also be responsible, at the Contractor's sole cost and expense, for all measures necessary to protect any property adjacent to the Project and improvements therein. Any damage to such property or improvements shall be promptly repaired by the Contractor at its sole expense.

§ 10.2.12 The Contractor shall immediately contact the Construction Manager and, within 24 hours, report, in writing, to the Owner, Architect and Construction Manager, all accidents arising out of or in connection with the Work which cause death, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious property damages are caused, the accident shall be reported immediately by telephone or messenger to the Owner, Construction Manager, and Architect.

§ 10.2.13 The Contractor shall be solely responsible for any conditions that develop during construction and in the event any structure is dislocated, over strained, or damaged so as to affect is usefulness, the Contractor shall be solely responsible. The Contractor shall take whatever steps necessary to strengthen, relocate or rebuild the structure to meet requirements at the sole expense of the Contractor.

§ 10.2.14 The Contractor is responsible for restoration or repair of utilities, private property, buildings, pavement, walkways, roads, etc. damaged by its activities under this Agreement to the satisfaction of the Owner, Construction Manager and Architect.

§ 10.2.15 From the commencement to the final completion of the Work, the Contractor shall keep the Work and the Owner's building(s) free from accumulation of water no matter the source or cause of water infiltration. This responsibility shall include additions/alterations of existing buildings. The Contractor shall be responsible for temporary roofing, tarps and other protection at roofs, cavity walls, etc. Should the Contractor fail to provide adequate protection causing flooding, damage or other disturbance to the existing building(s), the Contractor shall be responsible for all costs associated with clean up, remediation and repairs. Inasmuch as flooding and water damage have safety implications to the general public, clean up, remediation and repairs may be made by the Owner without prior notice to the Contractor. Administration costs incurred by the Owner, Construction Manager and Architect will also be back charged to the Contractor. The Contractor, by entering into this Contract, agrees to be liable for these costs.

§ 10.2.16 Where solvents, chemicals, etc. are used in the installation or cleaning of materials or equipment under this Contract, which might cause injury or sickness to an employee or occupant of the building, they shall be used in strict conformance with the manufacturer's direction, material safety data sheets (OSHA 20) in the handling, storage and application of such materials shall be obtained by the Contractor and strictly adhered to. Every precaution shall be taken to prevent seepage of toxic fumes into the building. All hazardous waste material shall not be deposited in any dumpster, in any drain, or any part of the site, but shall be collected in a container specifically authorized by the EPA for the collection of said material, transported in accordance with DOT regulations and legally disposed of. Permits shall be obtained for storage, treatment and disposal of all hazardous materials.

§ 10.2.17 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall

be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents and all applicable laws, rules and regulations regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to, asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner, Construction Manager and Architect in writing. The Owner shall arrange for the material to be tested and if the test reveals that the material is a hazardous material or substance which has not been rendered harmless, the Owner shall pay for the test; otherwise, the Contractor shall bear the cost of the test and the Contract Sum shall be reduced by the amount of that cost. The Contractor shall comply with the reasonable instructions of the Owner after the test is conducted. This Section shall not apply in the case of asbestos which is to be removed and disposed of as part of the Work of the Contract.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify a presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and the Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the fullest extent permitted by law, but only to the extent of available insurance proceeds, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Construction Manager, Architect, their consultants, and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that the person seeking indemnification: (1) did not bring such material onto the Project site; (2) timely provided notice of the condition and stopped Work in the affected area as required by Section 10.3.1; and (3) has a claim, damage, loss or expense that is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself). The Owner shall have no indemnity obligation to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity or the fault or negligence of a third party for whom the Owner is not responsible.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence or fault on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance (that was not brought to the site by the Contractor or those for whom the Contractor is responsible) solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.3.7 The Contractor shall notify the Owner of any storage, use, or discovery of hazardous material on the Project site which the Contractor knows or reasonably should know could cause bodily injury or death and of any injury or death attributable to any such hazardous material.

§ 10.3.8 The Contractor shall take all reasonable precautions and measures to prevent any contamination by or spread or disturbance of hazardous or potentially hazardous substances or materials stored, used, or discovered on the Project site.

§ 10.3.9 For the avoidance of any doubt, COVID-19 shall not be considered a Hazardous Material for purposes of this Article 10.3.

§ 10.4 Emergencies

§ 10.4.1 The Contractor shall provide at the site, such equipment and medical facilities as are necessary to supply first-aid service to anyone at the Work.

§ 10.4.2 The Contractor must promptly report in writing to the Construction Manager all emergencies whatsoever arising out of, or in connection with the performance of the Work, whether on, or adjacent to the site, which caused death, personal injury or property damages, giving full details and statements of witnesses. In addition, if death, injury, or damages are caused, the emergency shall be reported immediately to the Construction Manager, Owner, and Architect.

§ 10.4.3 In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

§ 10.4.4 All fire and emergency access, including roads, rights-of-way, corridors, doors, and stairs, and all existing fire and smoke detection systems shall be maintained at all times in accordance with fire safety laws. If the Work requires the temporary obstruction of any fire and emergency access or existing fire and smoke detection systems, the Construction Manager shall be notified at least 72 hours in advance.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Liability Insurance

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies licensed to do business in State of New York, having an A.M. Best "A-" or better rating, and one to which the Owner has no reasonable objection such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

.1 Claims under workers' compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed, including private entities performing Work at the site and exempt from the coverage on account of number of employees or occupation, which entitles shall maintain voluntary compensation coverage at the same limits specified for mandatory coverage for the duration of the Project. As required by the New York State Workers' Compensation Law, all out of state contractors working in New York must provide a Workers' Compensation Insurance Policy that specifically lists New York in Item 3A of the Policy Information page;

.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees or persons or entities excluded by statute from the requirements of Section 11.1.1.1 but obligated by the Contract Documents to provide the insurance required by that section;

.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;

.4 Claims for damages insured by usual personal injury liability coverage;

.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

.6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;

.7 Claims for bodily injury or property damage arising out of completed operations;

.8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18;

.9 Where the Contract or Subcontract involves asbestos, the insurance required by Section 11.1 shall specifically include the words asbestos abatement work and shall specify any limitations on completed operation time period. If there is a limitation, it will be at the Owner's discretion to accept or reject that limitation;

.10 Insurance must remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing or replacing defective Work in accordance with Section 12.2.2.2;

.11 Liability insurance (including Umbrella Excess Liability policy) shall include all major divisions of coverage and be on a comprehensive basis. The required coverage shall be written on an occurrence basis and shall include the following:

a. Premises Operations (including X, C and U coverage as applicable).
b. Independent Contractor's Protective.
c. Products and Completed Operations.
d. Contractual, including specified provision for Contractor's obligation under Section 3.18 of the General Conditions.
e. Owned, non-owned and hired motor vehicles.
f. Broad Form Property Damage including Completed Operations.
g. Pollution Legal Liability Insurance (as applicable to the Prime Contract or Subcontract including asbestos abatement activities).
h. Personal injury liability with Employment Exclusion deleted.

.12 The insurance policies required to be purchased and maintained by the Contractor under this Agreement shall be: (i) written on an occurrence basis, and (ii) shall be primary on a per project basis for the defense and indemnification of any action or claim asserted against the Owner (and its Board, employees and volunteers), Construction Manager, Architect, and/or the Contractor for Work performed under the Agreement regardless of any other collectible insurance or any language in the insurance policies that may be to the contrary. The policies of the Owner and Architect and their consultants shall be excess and noncontributory.

.13 A fully completed New York Construction Certificate of Liability Insurance Addendum (Acord 855 2014/15) must be included with the certificates of insurance. For any "yes" answers on Items G through L on this Form – additional details must be provided in writing.

The Contractor shall not commence work under this Contract and shall not be considered "approved" until it has obtained all insurance required in this Article 11 and the Specifications, and such insurance has been approved by the Owner; nor shall the Contractor allow any of its Subcontractors to commence work under its Subcontract until it has obtained all similar insurance for protection of itself, the Contractor and the Owner.

§ 11.1.2 The insurance required by Article 11 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of three years after Final Completion of the Work. All coverages are to be written on an occurrence basis unless approved by the Owner.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Article 11 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.3.1 The insurance requirements set out herein and elsewhere in the Contract Documents are independent from all other obligations of the Contractor under the Contract Documents and apply whether or not required by any other provision of this Agreement.

§ 11.1.3.2 Neither the Owner or Construction Manager shall have any duty to the Contractor or to any of its insurers or their insurance agents to review any certificates or copies of insurance furnished by the Contractor or to determine whether the terms of each certificate or policy of insurance comply with the insurance-related provisions of the Agreement. A failure to detect that the Contractor has not submitted certificates, or proper certificates, or is otherwise not in compliance with the insurance-related provisions of the Agreement shall not be considered a waiver or other impairment of any of the Owner's rights under such insurance-related provisions.

§ 11.1.4 The Contractor shall cause all liability insurance policies coverage required by the Contract Documents (excluding Workers' Compensation) to include (1) the Owner (and its Board of Education, employees and

volunteers), Construction Manager, Architect, and their consultants as additional insureds on a primary and non-contributory for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner (and its Board of Education, employees and volunteers) as additional insureds on a primary and non-contributory for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations. If the terms of policies expire, or the lives of the insurance companies terminate, before the Contract is completed or during the period of completed operations coverage, and the Contractor fails to maintain continuance of such insurance, the Owner is entitled to provide protection for itself, to pay premiums, and to charge the cost to the Contractor.

§ 11.1.5 It is expressly understood and agreed that:

.1 The amount of insurance provided in the insurance coverages required by Article 11 and any other provision of the Contract Documents shall not be construed to be a limitation of the liability on the part of the Contractor or any of its Subcontractors.

.2 Any type of insurance or any increase in limits of liability not described above which the Contractor requires for its own protection or on account of statute shall be its own responsibility and at its own expense and shall not be charged back to the Project.

.3 The carrying of insurance described shall in no way be interpreted as relieving the Contractor or any Subcontractor of any responsibility or liability under the Contract.

.4 In the event of a failure of Contractor to furnish and maintain said insurance and to furnish satisfactory evidence thereof, the Owner shall have the right (but not the obligation) to take out and maintain the same for all parties on behalf of the Contractor who agrees to furnish all necessary information thereof and to pay the cost thereof to the Owner immediately upon presentation of an invoice.

.5 Any work performed without having the insurance coverage is at Contractor's own risk.

.6 The Contractor agrees to indemnify the Owner for any applicable deductibles and self-insured retentions.

§ 11.1.6 Schedule of Insurance

The Contractor and its Subcontractors, at their own expense, shall procure and maintain the following insurance coverages with limits of liability not less than the limits specified, or greater if required by law.

§ 11.1.6.1 Workers' Compensation and Employers' Liability

Workers' compensation and employers' liability insurance coverage complying with the laws of the Project location and elsewhere as may be required and shall include a minimum of:

Workers' Compensation	Statutory
Bodily Injury by Accident:	$1,000,000 Each Accident
Bodily Injury by Disease:	$1,000,000 Each Employee
Bodily Injury by Disease:	$1,000,000 Policy Limit

The workers' compensation and employers' liability policies shall be endorsed to waive the right of subrogation against the Owner and its Board of Education, employees and volunteers, Construction Manager and Architect.

§ 11.1.6.2 Commercial General Liability

Commercial general liability written on ISO occurrence form providing coverage for Premises and Operations, Products-Completed Operations, Independent Contractors, Personal and Advertising Injury (Employment Exclusion deleted), Blanket Contractual Liability, and Broad Form Property Damage (including coverage for Explosion, Collapse, and Underground Hazards).

Occurrence Form:	
General Aggregate:	$2,000,000 (per project)
Products/Completed Operations Aggregate:	$2,000,000 (per project)
Each Occurrence:	$1,000,000
Personal and Advertising Injury:	$1,000,000
Property Damage (Aggregate)	$2,000,000 (per project)
Property Damage (Each Occurrence)	$1,000,000
Fire Damage (any one fire):	$300,000
Medical Expense (any one person):	$10,000

The Contractor shall cause the commercial liability coverage required herein to include Bodily Injury and Property Damage, Damage for Premises/Operations, Products and Completed Operations provided by the General Liability coverage form CG 00 01 in connection with work to be completed by the Contractor and all subcontractors and consultants, with the Owner and its Board of Education, employees and volunteers, Architect and Construction Manager named as additional insureds, on a primary and non-contributory basis, including ongoing and completed operations using ISO form CG 20 10 04/13 or the CG 20 38 04/13 combined with the CG 20 37 04/13. Products and Completed Operations Coverage must be maintained for a period of at least three (3) years after final payment and must provide that the Owner and its Board of Education, employees and volunteers are additional insureds on a primary, non-contributory basis for the same period (using ISO form CG 20 10 04/13 or CG 20 38 04/13 combined with the CG 20 37 04/13). These limits must apply on a per project basis. Coverage must be written on CG 00 01 form or its equivalent. The commercial general liability policy shall be endorsed to waive the right of subrogation against the Owner and its Board of Education, employees and volunteers, Construction Manager and Architect.

§ 11.1.6.3 Automobile Liability

Business automobile liability, including liability arising out of any owned, leased, non-owned or hired automobile with per accident limits of liability of not less than $1,000,000. The Contractor shall cause the automobile liability coverage required herein to include the Owner and its Board of Education, employees and volunteers, Construction Manager, Architect, and their consultants as additional insureds on a primary and non-contributory basis. The automobile liability policy shall be endorsed to waive the right of subrogation against the Owner and its Board of Fire Education, employees and volunteers , Construction Manager and Architect.

§ 11.1.6.4 Owners and Contractors Protective Liability Insurance

The Contractor shall procure and maintain at the Contractor's own expense until final completion of the Work covered by the Contract, and any extension thereof, Owners and Contractors Protective Liability Coverage issued in the name of the Owner and covering the liability for damages imposed by law upon the Owner with respect to all operations under the agreement by the Contractor or its Subcontractors, including omissions and supervisory acts of the Owner. Such policy shall be delivered to the Owner no later than fifteen (15) days of awarding the Contract. Unless otherwise specifically required by special specifications, each policy shall be issued with limits not less than $1,000,000 per occurrence and $2,000,000 aggregate.

§ 11.1.6.5 Pollution Legal Liability Insurance

If the Work includes the removal, mitigation or other handling of pollutants or hazardous materials of any type, the Contractor will be required to carry and maintain pollution legal liability insurance coverage with the minimum limits set forth below, in a form acceptable to the Owner and written by an insurance company acceptable to the Owner. Proof of such coverage shall be provided prior to the commencement of the Work. With coverage for the services rendered for the Owner, including, but not limited to removal, replacement enclosure, encapsulation and disposal of asbestos, or any other hazardous material, along with any related pollution events, including coverage for third-party liability claims for bodily injury, property damage and clean-up costs. The limits shall be as follows:

Each Occurrence:	$1,000,000
Products and Completed Operations Aggregate:	$2,000,000
General Aggregate:	$2,000,000 (specific to the project)

These limits shall include products and completed operations. The Contractor's pollution legal liability policy shall also include coverage for non-owned disposal site liability, mold remediation and related expenses. If retroactive date is used, it must pre-date the inception of the Contract. If the Contractor is using motor vehicles to be used for transporting hazardous materials, the Contractor shall provide pollution legal liability broadened coverage (ISO endorsement CA 9948 or equivalent) as well as proof of MCS 90. The coverage shall include a three-year reporting period following substantial completion of the Work. The Contractor shall cause the pollution liability coverage required herein to include the Owner and its Board of Education, employees and volunteers, Construction Manager, Architect, and their consultants as additional insureds on a primary and non-contributory basis. The pollution legal liability policy shall be endorsed to waive the right of subrogation against the Owner and its Board of Education, employees and volunteers , Construction Manager and Architect.

§ 11.1.6.6 Umbrella Liability

Provide follow form excess coverage over the commercial general liability, employers' liability, automobile liability

and pollution legal liability (if required by contract) policies with limits not less than $5,000,000 each occurrence and $5,000,000 aggregate specific to the Contract. The Contractor shall cause the excess coverage required herein to include the Owner and its Board of Education, employees and volunteers, Construction Manager, Architect, and their consultants as additional insureds on a primary and non-contributory basis. The umbrella liability policy shall be endorsed to waive the right of subrogation against the Owner and its Board of Fire Education, employees and volunteers, Construction Manager and Architect.

§ 11.2 Owner's Liability Insurance

The Owner shall purchase and maintain the Owner's usual liability insurance. Neither the Owner's usual liability insurance nor any other insurance obtained by the Owner reduces or otherwise affects the Contractor's insurance requirements under Section 11.1.

§ 11.3 Property Insurance

§ 11.3.1 The Contractor shall purchase and maintain, in a company lawfully authorized to do business in New York, property insurance written on a builder's risk "all risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project. Losses up to the deductible amount shall be the responsibility of the Contractor unless caused solely by the Owner.

§ 11.3.1.1 The Contractor's property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for the Architect's, Contractor's, and Construction Manager's services and expenses required as a result of such insured loss. This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.2 The said insurance policy shall contain a provision that the loss, if any, is to be made adjustable with and payable to the Owner as trustee for the insureds, and a provision that it shall not be changed or cancelled and that it will be automatically renewed upon expiration and continued in force unless the Owner is given thirty (30) days written notice to the contrary.

§ 11.3.1.3 The Contractor shall have the sole responsibility to promptly report any loss to the insurer and to furnish the latter with all necessary details relating to the occurrence of the loss and the amount thereof. The Owner, Construction Manager, Architect, Contractor and all subcontractors of the Contractor waive all rights, each against the others, for damages caused by fire or other perils covered by insurance provided under the terms of this Section, except such rights as they may have to the proceeds of insurance received; provided, however, this waiver shall not apply to any manufacturer, supplier or similar agent under any guarantee or warranty.

§ 11.3.1.4 The Contractor shall not violate or permit to be violated any condition of such policy and shall at all times satisfy the fire safety requirements of the Owner and the insurance company issuing the same.

§ 11.3.1.5 The procurement and maintenance of said policy shall in no way be construed or be deemed to relieve the Contractor from any of the obligations and risks imposed upon it by this Contract or to be a limitation on the nature or extent of such obligations and risks.

§ 11.3.1.6 Not less than thirty days prior to the expiration date or renewal date, the Contractor shall supply the Owner with an updated replacement certificate of insurance and endorsements. The Contractor shall advise the Owner of any letter or notification that cancels, materially changes, or non- renews the policy and Contractor shall require the insurance carrier(s) to copy the Owner on any letter or notification that cancels, materially changes, or non- renews the policy. Before the Contractor shall be entitled to have any progress payment rendered on account of the work which is to be insured pursuant to this Section, it shall furnish to the Owner a certificate in duplicate of the insurance herein required. Such insurance must be procured from an insurance carrier approved by the Owner, licensed to do business in the State of New York ("admitted" carrier), and rated at least "A-" by A.M. Best Company.

§ 11.3.2 Boiler and Machinery Insurance. The Owner, if applicable to the Work and at its sole option, may purchase and maintain boiler and machinery insurance or shall do so if required by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner. This insurance will include interests of the Owner, Construction Manager, Contractor, Subcontractors and Sub-subcontractors in the Work.

§ 11.3.3 Loss of Use Insurance. The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described in this Section 11.3 or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost for it will be charged to the Contractor by appropriate Change Order.

§ 11.3.5 Upon the Contractor's request, the Owner will provide copies of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project.

§ 11.3.6 Waivers of Subrogation. The Owner and Contractor waive all rights against (1) each other and any of their respective subcontractors, sub-subcontractors, agents and employees, and (2) the Construction Manager, Construction Manager's consultants, Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their respective subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire or other causes of loss to the extent of proceeds under property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as the Owner and Contractor may have to the proceeds of such insurance held by the Owner. The Owner or Contractor, as appropriate, shall require of the Construction Manager, Construction Manager's consultants, Architect, Architect's consultants, Owner's separate contractors described in Article 6, if any, and any of their respective subcontractors, sub-subcontractors, agents, and employees, by appropriate written agreements, similar waivers each in favor of other parties enumerated in this Section 11.3.6. The policies must provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation is effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity has an insurable interest in the property damaged.

§ 11.4 Performance Bond and Payment Bond

§ 11.4.1 The Contractor shall furnish performance and labor and material payment bonds, each in an amount equal to one hundred percent (100%) of the Contract Sum, meeting all statutory requirements of the State of New York, in form and substance satisfactory to the Owner in its sole discretion and, without limitation, complying with the following specific requirements:

- **.1** The prescribed form of the performance and payment bonds shall conform to AIA A312-2010, and other shall be satisfactory to the Owner in the Owner's sole judgment;
- **.2** The cost of the required bonds shall be included in the Contract Sum;
- **.3** Bonds shall be executed by a responsible surety licensed in New York State, listed in the latest issue of the U.S. Treasury Circular 570 and having an A.M. Best's rating of no less than A-/IX and shall remain in effect for a period not less than two years following the date of Substantial Completion or the time required to resolve any items of incomplete Work and the payment of any disputed amounts, whichever time period is longer;
- **.4** The Contractor shall require the attorney in fact who executes the required bond on behalf of the surety to affix thereof a certified and current copy of his power of attorney indicating the monetary limit of such power. The signatures of the Contractor and Surety shall be acknowledged by a notary public;
- **.5** Every bond under this Section 11.4.1 must display the surety bond number.

§ 11.4.2 A rider including the following provisions shall be attached to each bond:

1. This bond includes performance by the Contractor of any correction and warranty obligations in the Contract Documents, including such performance after the dates of Substantial Completion and final completion.

2. Surety hereby agrees that it consents to and waives notice of any addition, alteration, omission, change, or other modification of the Contract Documents. Such addition, alteration, change,

extension of time, or other modification of the Contract Documents, or a forbearance on the part of either the owner or the Contractor to the other, shall not release the Surety of its obligations hereunder and notice to the Surety of such matters is hereby waived.

3. Surety further agrees that in event of any default by the Owner in the performance of the Owner's obligations to the Contractor under the Contract, the Contractor or Surety shall cause written notice of such default (specifying said default in detail) to be given to the Owner, and the Owner shall have thirty (30) days from time after receipt of such notice within which to cure such default, or such additional reasonable period of time as may be required if the nature of such default is such that it cannot be cured within thirty (30) days. Such Notice of Default shall be sent by certified or registered U.S. Mail, return receipt requested, first class postage prepaid, to the Owner.

§ 11.4.3 All bonds shall be maintained in full force during the duration of the Project and for a period of two (2) years after the date of the Contractor's acceptance of final payment as guarantee that the Contractor will make good any faults or defects in the work arising from improper or defective workmanship or materials which may appear during the comeback warranty period.

§ 11.4.4 The Contactor shall deliver the required bonds to the Owner prior to beginning construction activity at the Project site, but no later than seven (7) days after execution of the Contract.

§ 11.4.5 The Owner may, in the Owner's sole discretion and without prior notice to the Contractor, inform surety of Contractor's Work and obtain consents as necessary to protect the Owner's rights, interest, privileges and benefits under and pursuant to any bond issued in connection with the Contractor's Work.

§ 11.4.6 If the surety on any Bond furnished by the Contractor is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of this Article, the Contractor shall within ten (10) days thereafter substitute another Performance and Payment Bond and surety, both of which must be acceptable to the Owner.

§ 11.4.7 The Contractor shall keep the surety informed of the progress of the Work, and, where necessary, obtain the surety's consent to, or waiver of: (1) notice of changes in the Work; (2) request for reduction or release of retention; (3) request for final payment; and (4) any other material required by the surety. The Owner shall be notified by the Contractor, in writing, of all communications with the surety. The Owner may, in the Owner's sole discretion, inform the surety of the progress of the Work and obtain consents as necessary to protect the Owner's rights, interest, privileges and benefits under any pursuant to any bond issued in connection with the Work.

§ 11.4.8 Notwithstanding any other provisions in any performance or payment bond, it shall not be a condition precedent to termination of a Contract or Contractor that notice be sent to or meeting be arranged or held with the Contractor (principal) and surety, prior to such termination. Any such requirement(s) shall be void and unenforceable and the Owner shall have the right to reject any such bond(s) or ignore such condition. The exclusive method of termination of a Contract or the Contractor is contained in the Contract Documents, and the Contractor and surety expressly agree to be bound thereby.

§ 11.4.9 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.4.10 The Contractor shall provide for the continuation of the performance bond as a maintenance bond for two (2) full years after the date of final payment request at the full final Contract Sum.

§ 11.5 Neither the procurement nor the maintenance of any type of insurance by the Owner or the Contractor shall in any way be construed or be deemed to limit, discharge, waive or release the Contractor from any of the obligations and risks imposed upon him by the Contract or to be a limitation on the nature or extent of such obligations or risks.

§ 11.6 Nothing in the Contract shall create or give to third parties any claim or right of action against the Contractor, Architect, Construction Manager or Owner beyond such as may legally exist irrespective of the Contract.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Construction Manager's or Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by either, be uncovered for their examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered which the Construction Manager or Architect has not specifically requested to observe prior to its being covered, the Construction Manager or Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or one of the other Contractors in which event the Owner shall be responsible for payment of such costs.

§ 12.2 Correction of Work

§ 12.2.1 Before or After Final Payment

The Owner, through its Architect or Construction Manager, shall have the authority to reject Work performed by the Contractor that does not conform to the requirements of the Drawings, Specifications, or both. The Contractor shall promptly correct Work rejected by the Construction Manager or Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Construction Manager's and Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Final Payment

§ 12.2.2.1 If, within two (2) years after the date of Final Payment for the Work or a designated portion thereof, or after the date for commencement of warranties established otherwise in the Contract Documents, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The obligation set forth hereunder shall survive acceptance by the Owner of the Work or termination of the Contract. The Owner shall give such notice promptly after discovery of the condition. The Contractor's Performance Bond shall remain in full force and effect through this two-year comeback correction period.

§ 12.2.2.2 The two-year period for correction of the Work shall be extended with respect to portions of Work first performed after Final Payment by the period of time between Final Payment and the actual completion of that portion of the Work.

§ 12.2.2.3 Upon completion of any Work under or pursuant to this Section 12.2, the two-year period for correction of Work in connection with the Work requiring correction shall be renewed and recommence.

§ 12.2.2.4 The obligations shall cover any repair and replacement to any part of the Work or other property caused by the defective or nonconforming Work.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.3.1 If the Contractor fails to commence to correct, repair and make good any defects in its Work within a reasonable time, not to exceed ten (10) days from the date the Contractor received written notice from the Owner per Section 12.2.2.1, the Owner may correct it in accordance with Section 2.5 and the Contractor shall, upon demand, pay to the Owner all amounts which it expends for such corrective work.

§ 12.2.3.2 In emergencies occurring during the two-year correction period, the Owner may correct any defect immediately and charge the cost to the Contractor. The Owner shall at once notify the Contractor, who may take over the Work and make any corrections remaining after its forces arrive at the Work. Repair work not started within ten (10) days following notice to the Contractor of any defect may be considered an emergency.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner, Multiple Prime Contractors or Separate Contractors, whether completed or partially completed, caused by the Contractor's

correction or removal of Work that is not in accordance with the requirements of the Contract Documents. The Contractor shall also replace or repair to satisfaction of Owner any and all damage done to the building or its contents in consequence of work performed in fulfilling any applicable warranty. This clause is general in nature and will not operate to waive stipulations of other clauses that specify warranty periods in excess of two (2) years.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the two-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as determined by the Owner, with the advice of the Construction Manager and Architect. Such adjustment shall be effected whether or not final payment has been made. For this Section to apply, the Owner must accept non-conforming Work in writing specifying the non-conforming Work being accepted. Notwithstanding any acceptance by the Owner, if the Owner discovers non-conforming Work that the Owner has not expressly accepted in writing, the Owner may demand that the Contractor correct such Work as per the provisions of Article 12 hereof.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the State of New York, and the parties expressly agree that any claim, dispute, or other controversy of any nature arising out of the Contract or performance of the Work shall be commenced and maintained in New York State Supreme Court, Westchester County.

§ 13.1.2 The Contractor shall at all times observe and comply with all federal, state and local laws and all laws, ordinances and regulations of the Owner, in any manner affecting the Work and all such orders decreed as exist at present and those which may be enacted later, by bodies or tribunals having jurisdiction or authority over the Work, and the Contractor shall defend, indemnify and save harmless the Owner and its Board of Education, officers, agents, or servants against any claim or liability arising from, or based on, a violation of any such law, ordinances, regulation, order or decree, whether by himself or by his employee or agents. Historical lack of enforcement of any law, local or otherwise, shall not constitute a waiver of Contractor's responsibility for compliance with such law in a manner consistent with the Agreement unless and until the Contractor has received written consent for the waiver of such compliance from the Owner and the agency responsible for the enforcement of such law.

§ 13.1.3 Except as other specified, the Contractor shall comply with the current editions of applicable specifications of the following agencies, herein referenced. In the case of conflicting requirements, the most stringent shall apply: New York State Department of Education (NYSED); American Society for Testing and Materials (ASTM); New York State Department of Health (NYSDH); applicable NYS Building Code; U.S. Department of Commerce, Commercial Standards (C.S.); New York State Department of Public Work (NYSDPW); American National Standards Institute (ANSI); National Electric Code (NEC); American Insurance Association; National Fire Protection Association (NFPA); Americans with Disabilities Act (ADA); SMACNA - Technical Manuals and Standards; IAQ (Indoor Air Quality) Guidelines of Occupied Buildings Under Construction - 1995.

§ 13.1.4 Building codes, regulations, and other applicable governmental requirements shall govern the Work of this Project. The Contractor shall comply with all requirements of the Occupational Safety and Health Administration (OHSA) of the U.S. Department of Labor, and all regulations of the New York State Labor Law pertaining to hazardous conditions that may develop in connection with the Work of this Contract. All Work and materials of the Contract shall comply with all federal, state, county and local building, health, plumbing, HVAC, and electrical codes, laws, ordinances and regulations that apply to the Work. All Work of this Project shall be subjected to the provisions of all applicable requirements of local utility company regulations. Any covered product or material used shall comply with combustion/toxicity tests as found in the New York State Building Code and shall be listed by the Department of State Building Materials and Finishes Data File.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided

in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.2.3 In case any provision of this Agreement should be held to be contrary to, or invalid, under the law of any country, state or other jurisdiction, such illegality or invalidity, shall not affect in any way, any other provisions hereof, all of which shall continue, nevertheless, in full force and effect in any country, state or jurisdiction in which such provision is legal and valid.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 Neither the acceptance of all or any part of the work covered by the Contract; nor any payment therefore; nor any order or application for payment issued under the Contract or otherwise issued by the Owner, Architect, Construction Manager, or any board member, officer, agent or employee of the Owner; nor any permission or direction to continue with the performance of the Contract before or after its specified completion date; nor any performance by the Owner of any of the Contractor's duties or obligations; nor any aid lent to the Contractor by the Owner in its performance of such duties or obligations; nor any delay or omission by the Owner to exercise any right or remedy accruing to it under the terms of the Contract or existing at law or in equity or by statute or otherwise; nor any other thing done or omitted to be done by the Owner, its commissioners, officers, agents or employees; shall be deemed to be a release to the Contractor or its sureties from any obligations, liabilities or undertakings in connection with the Contract or the performance bond or a waiver of any provision of the Contract or of any rights or remedies to which the Owner may be entitled because of any breach thereof, excepting only a written instrument expressly providing for such release or waiver. No cancellation, rescission or annulment hereof, in whole or as to any part of the Contract, because of any breach hereof, shall be deemed a waiver of any money damages to which the Owner may be entitled because of such breach. No waiver by the Owner of any breach of the Contract shall be deemed to be a waiver of any other or any subsequent breach.

§ 13.3.3 The rights stated in these General Conditions and the Contract Documents are cumulative and not in limitation of any rights of the Owner at law or in equity.

§ 13.3.4 The Owner shall not be responsible for damages or for loss of anticipated profits on Work not performed on account of any termination of the Contractor by the Owner or by virtue of the Owner's exercise of its right to take over the Contractor's Work.

§ 13.3.5 The Owner shall not be liable to the Contractor for punitive damages on account of its termination of the Contractor or any other alleged breach of the Agreement and the Contractor hereby expressly waives its right to claim such damages against the Owner.

§ 13.3.6 The Contractor hereby expressly waives any rights it may have in law or in equity to lost bonding capacity as a result of any of the actions of the Owner, the Architect or the Construction Manager taken in connection with the Contractor's Work on the Project.

§ 13.3.7 The Contractor agrees that it waives the defense of privity of contract as between itself and each other Multiple Prime Contractor. In the event that an act or omission by a Multiple Prime Contractor or its Subcontractors of any tier causes impact, damage or loss in any form to the Contractor, then the Multiple Prime Contractor responsible in whole or in part for such impact, damage or loss agrees it is directly responsible and liable to the Contractor. The Contractor acknowledges and agrees that this waiver of the defense or privity of contract permits and requires it to commence an action or suit directly against the responsible Multiple Prime Contractor. The Owner, Architect and the Construction Manager shall not be parties to such suit. The Contractor waives and relinquishes any right and claim as against the Owner, to the extent such claim is caused, or contributed to, by a Multiple Prime Contractor or its subcontractors of any tier.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Tests, inspections and approvals of portions of the Contractor's Work required by the Drawings or Specifications shall be made at an appropriate time. Unless otherwise provided, the Contractor shall arrange for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Construction Manager and Architect timely notice of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.4.1.1 Tests inspections and approval of portions of the Contractor's Work required by laws, ordinances, rules, regulations or orders of public authorities or governmental agency having jurisdiction shall be made at an appropriate time. The Contractor shall consult with the Architect concerning the need for testing and/or inspection of its Work pursuant to law, ordinance, regulation or orders of public authorities or governmental agencies and shall advise the Owner in writing that it has made arrangements for such tests, inspections and approvals with the appropriate public authority or governmental agency. The Contractor shall be solely responsible for making timely notice of the need for a test, inspection and/or approval with the relevant public authority or governmental agencies and shall bear all costs associated with such testing, inspection or approval required by such public authority or governmental agency.

§ 13.4.2 If the Construction Manager, Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.4.1, the Construction Manager or Architect shall, upon written authorization from the Owner, instruct the Contractor to arrange for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Construction Manager and Architect of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If such procedures for testing, inspection or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Construction Manager's and Architect's services and expenses shall be at the Contractor's expense, including the cost of retesting for verification of compliance if necessary until the Architect certifies that the Work in question does comply with the requirements of the Contract Documents, and none of such costs shall be included in computing the Contract Sum.

§ 13.4.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Construction Manager for transmittal to the Architect.

§ 13.4.5 If the Construction Manager or Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Construction Manager or Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.4.7 Any material to be furnished shall be subject to inspections and tests in the shop and field by the Architect. Shop inspection shall not relieve the Contractor of the responsibility to furnish satisfactory materials and the right is reserved to reject any material at any time before final acceptance of the Work, when in the opinion of the Architect the materials and-/or workmanship do not conform to the Specification requirements.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the legal rate as required in General Municipal Law Section 106-b.

§ 13.6 Time Limits on Claims

§ 13.6.1 No action or proceeding shall lie or be maintained by the Contractor, nor anyone claiming under or through the Contractor, against the Owner upon any claim arising out of or based on the Agreement or the Contract Documents or by reason of any act or omission or requirements relating to the giving of notices and information, unless such action or proceeding shall be commenced within one (1) year after submission to the Owner of the final Application for Payment. As to a claim based upon money required to be retained for any period after the date of the final Application for Payment, such action must be commenced within six (6) months after such money becomes due and payable under the terms of the Contract. Notwithstanding, if the Contract is terminated by the Owner, any action or proceeding by the Contractor must be commenced within six (6) months after the date of such termination. The Contractor's acceptance of final payment shall constitute a release of all claims against the Owner. This provision shall not relieve the Contractor of the obligation to comply with the provisions of the law relating to notices of claim.

§ 13.6.2 Acts or failures to act occurring during the construction of the Project or following the issuance of the final certificate for payment, which give rise to a cause of action shall be deemed to have accrued in any and all events not later than the date of any act or failure to act by the Contractor pursuant to any warranty provided under Section 3.5, the date of any correction of the Work or failure to correct the Work by the Contractor under Section 12.2, or the date of actual commission of any other act or failure to perform any duty or obligation by the Contractor, whichever occurs last.

§ 13.7 No Oral Waiver or Constructive Changes

The provisions of the Contract Documents shall not be changed, amended, waived, or otherwise modified in any respect except by a writing signed by the Owner. No person is authorized on behalf of the Owner to orally change, amend, waive, or otherwise modify the terms of the Contract Documents or any of the Contractor's duties or obligations under or arising out of the Contract Documents. Any change, waiver, approval, or consent granted to the Contractor shall be limited to the specific matters stated in the writing signed by the Owner, and shall not relieve the Contractor of any other of the duties and obligations under the Contract Documents. No "constructive" changes shall be allowed.

§ 13.8 Notices Regarding Liens

The Contractor shall provide to the Owner copies of all notices of any type regarding liens received from Subcontractors, Sub-subcontractors, or suppliers to the Contractor.

§ 13.9 Wages Rates

The Contractor shall, and cause its Subcontractors to, comply with prevailing wage rate determinations as issued by the State of New York Department of Labor for the location and duration of this Project. Current wage rates for this Project are included in the Project Manual.

§ 13.10 General Provisions

Any specific requirement in this Contract that the responsibilities or obligations of the Contractor also apply to a Subcontractor is added for emphasis and is also hereby deemed to include a Subcontractor of any tier. The omission of a reference to a Subcontractor in connection with any of the Contractor's responsibilities or obligations shall not be construed to diminish, abrogate or limit any responsibilities or obligations of a Subcontractor of any tier under the Contract Documents or the applicable subcontract.

§ 13.11 Manufacturer's and Trade Standards

§ 13.11.1 Whenever any manufacturer of material utilized in the Project issues recommended fabrication, installation, erection, and/or application standards or instructions, such standards or instructions shall be strictly followed in the performance of the Work, except as specified otherwise.

§ 13.11.2 Whenever any trade, organization, institution, utility company, code group, society, association and governing board standard, or requirement of specification is adopted by reference in the Contract Documents, all Work related thereto shall be performed in strict accord with the referenced edition thereof and amendments thereto, except where a higher standard is specifically required by the Contract Documents.

§ 13.11.3 The Contractor shall take full responsibility for failure of materials, devices, equipment, systems, and finishes not fabricated, installed, erected, or applied in accord with the requirements of this Section and shall remove, replace, repair or correct any such failures or deficiencies promptly upon notification by the Owner or Architect.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 90 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped; or

.2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped; or

.3 Because the Construction Manager has not certified or the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4 and 9.5, or because the Owner has not made payment after 14 days written notice of such failure to make payment provided that such failure is not due to a disputed amount, and except to the extent the Owner is excused from timely making all or part of any payment on a Certificate for Payment as per any other provisions of the Contract Documents.

Notwithstanding the preceding or anything else in the Contract Documents, the Contractor shall not cease or delay the progress of the Work for any reason other than one set forth in Section 9.7.1, it being agreed that monetary damages shall be an adequate remedy for the Contractor for any breach of this Agreement or the Contract Documents by the Owner.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon 30 days' written notice and opportunity to cure to the Owner, terminate the Contract and recover from the Owner payment for such Work properly performed for which it has not otherwise been compensated, but in no event shall the Owner be liable to the Contractor for any prospective loss, including, but not limited to, termination expenses, loss of anticipated profits, impact damages, unabsorbed overhead, or the like. Notwithstanding the foregoing, any such payments to the Contractor shall be less any setoffs to which the Owner may be entitled as per any other provision of the Contract Documents.

§ 14.1.4 If the Work is stopped for a period of 90 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon 30 additional days' written notice to the Owner, Construction Manager and Architect (during which the Owner shall have the right and opportunity to cure), terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

.1 refuses or fails to supply enough properly skilled workers or proper materials or equipment to complete the Work in a diligent, efficient, timely, workmanlike, skillful, and careful manner;

.2 fails to make payment to Subcontractors or Suppliers for materials or labor in accordance with the respective agreements between the Contractor and its Subcontractors or Suppliers;

.3 disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority, or its health and safety plan;

.4 otherwise is guilty of substantial breach of or default under a provision of the Contract Documents;

.5 cannot complete the Work within the Contract Time or within the time to which such completion may have been extended; provided, however, that the impossibility of timely completion is, in the Owner's opinion, attributable to conditions within the Contractor's control;

.6 breaches any warranty made by the Contractor under or pursuant to the Contract Documents;

.7 is or has been unnecessarily or unreasonably or willfully delaying the performance and completion of the Work, or the award of necessary subcontracts, or the placing of necessary material and equipment orders;

.8 fails to furnish the Owner with assurances satisfactory to the Owner evidencing the Contractor's ability to complete the Work in compliance with all requirements of the Contract Documents;

.9 refuses to proceed with the Work or extra work when and as directed by the Owner, Construction Manager or Architect;

.10 fails after commencement of the Work to proceed continuously with the construction and completion of the Work for more than 10 days, except as permitted under the Contract Documents;

.11 fails or neglects to complete the Work within the Contract Time or in accordance with the Construction Schedule;

.12 refuses or fails to correct deficient Work performed by it;

.13 the Contractor's progress of the Work is such that the Owner reasonably believes that the Contractor shall not be able to achieve Substantial Completion by the Substantial Completion Date and the Contractor has not delivered and implemented a recovery plan required under the Contract or has not recovered the schedule sufficient to meet the respective Contract Time requirements as required by written notice to the Contractor by the Owner; or

.14 disregards the instructions of the Construction Manager, Architect or Owner (when such instructions are based on the requirements of the Contract Documents).

§ 14.2.2 When any of the above reasons exist, the Owner may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven (7) days' written notice, terminate employment of the Contractor at the expiration of such seven (7) day period, and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor and take possession of materials stored off-site by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient utilizing for such purpose such of the Contractor's plant, materials, equipment, tools and supplies remaining on the site, and also such subcontractors as it may deem advisable, or if may call upon the Contractor's surety at its own expense to do so. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work. Such accounting shall be final, binding and conclusive upon the Contractor, its surety, and any person claiming under or through the Contractor, as to the amount thereof.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 In the event that the Owner declared the Contractor in default of the Work or any part of the Work, the Contractor, in addition to any other liability to the Owner hereunder or otherwise provided for or allowed by law, shall be liable to the Owner for any costs it incurs for additional architectural, engineering and construction administration services necessary, in its opinion, because of the default and the total amount of other damages incurred by the Owner from the date when the Work should have been completed by the Contractor in accordance with the terms hereof to the date of actual completion of the Work, both of which items shall be considered as costs incurred by the Owner in completing the Work and the amount of which may be charged against and deducted out of such monies as would have been payable to the Contractor or its surety if the Work had been completed without a default. If the costs of finishing the Work exceed the unpaid Contract balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall, upon application, be certified by the Initial Decision Maker, and this obligation for payment shall survive termination of the Contract.

§ 14.2.4.1 The costs of finishing the Work also include, without limitation, all reasonable attorneys' fees incurred in responding to the default and enforcing the Owner's rights under the Contract Documents, additional title costs, insurance, additional interest because of any delay in completing the Work, loss of State Building Aid, and all other direct and indirect and consequential damages incurred by the Owner by reason of the termination of the Contractor as stated herein. In addition, the Owner shall have the right to recover all costs, including attorneys' fees, incurred by the Owner in enforcing its rights and remedies under this Section 14.2, including costs and attorneys' fees incurred in any dispute resolution proceeding.

§14.2.4.2 It is recognized that: (1) if an order for relief is entered on behalf of Contractor pursuant to Title 11 of the United States Code, (2) if any other similar order is entered under any other debtor relief laws, (3) if Contractor

makes a general assignment for the benefit of its creditors, (4) if a receiver is appointed for the benefit of its creditors, or (5) if a receiver is appointed on account of its insolvency, any such event could impair or frustrate Contractor's performance of the Contract. Accordingly, it is agreed that upon the occurrence of any such event, Owner shall be entitled to request of Contractor or its successor in interest adequate assurance of future performance in accordance with the terms and conditions of the Contract. Failure to comply with such request within ten (10) days of delivery of the request, or Owner's determination that the assurances are not adequate, shall entitle Owner to terminate the Contract and to the accompanying rights set forth in Subparagraphs 14.2.1 through 14.2.4 hereof. In all events pending receipt of adequate assurance of performance and actual performance in accordance therewith, Owner shall be entitled to proceed with the Work with its own forces or with other Contractors on a time and material or other appropriate basis, the cost of which will be back charged against the Contract Sum.

§ 14.2.5 If the Owner wrongfully terminates the Contract for cause, the rights, remedies and obligations of the parties will be the same as if the Owner had terminated the Contract for convenience under Section 14.4.

§ 14.2.6 In the event that the Contractor, or the Contractor's surety, challenges the Owner's termination of the Contract for cause, and the Owner prevails in litigation in connection with such challenge, whether initiated by the Owner or by the Contractor or the Contractor's surety, the Owner shall be entitled to its costs, including reasonable attorney's fees, incurred as a result of such litigation, as part of any judgment against the Contractor or the Contractor's surety. Such costs, including reasonable attorney's fees, shall be deemed a cost of finishing the Work.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine. The Owner shall incur no liability by reason of such suspension, delay, or interruption except that the Contractor may request an extension of its time to complete its Work in accordance with Article 8 hereof.

§ 14.3.2 The Contract Time shall be adjusted for increases in time caused by suspension, delay or interruption as described in Section 14.3.1. No adjustment shall be made to the extent:

- **.1** that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
- **.2** that an equitable adjustment is made or denied under another provision of this Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the whole or any portion of the Contract for the Owner's convenience and without cause upon not less than seven (7) days' written notice to the Contractor. Notwithstanding any other provision to the contrary in the Contract, the Owner reserves the right at any time and in its absolute discretion to terminate the services of the Contractor or the Work by giving written notice to the Contractor. This termination for convenience of the Owner provision allows and authorizes the Owner to terminate this Contract at any time and for any reason whatsoever. This right may be exercised by the Owner in its complete discretion. Termination by the Owner under this Section shall be by Notice of Termination delivered to the Contractor specifying the extent of termination and the effective date.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall immediately and in accordance with instructions from the Owner:

- **.1** cease operations as directed by the Owner in the notice;
- **.2** take actions necessary, or that the Owner may direct, for the protection and preservation of the Work;
- **.3** except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders; and
- **.4** proceed to complete the performance of the Work required under portions of the Contract not terminated, if any.

§ 14.4.3 Upon receipt of written notice of the Owner's exercise of such termination, the Contractor shall, as the Contractor's sole and exclusive remedy, be paid for the Work properly executed in accordance with the Contract Documents prior to the effective date of termination and for items properly fabricated off-site, delivered and stored in accordance with the Owner's instructions or the Contract Documents before such effective date. The Contractor's entitlement to payment for all such work shall be predicated on its performance of such work in accordance with the Contract Documents as certified by the Architect and Construction Manager. The Contractor shall be entitled to no other payment and waives any claim for damages including, but not limited to, lost profits, any prospective loss,

underutilization of personnel or equipment, unabsorbed overhead, and any and all items of consequential loss or damage. The Owner shall be entitled to credit against any payment to be made to the Contractor pursuant to this Section 14.4 the following: (1) payments previously made to the Contractor for the terminated portion of the Work; (2) claims which the Owner has against the Contractor under the Contract Documents; and (3) the value of the materials, supplies, equipment, or other items that are to be disposed of by the Contractor, the cost of which is included in the Contract Sum. Notwithstanding the foregoing, in the event of a termination under Section 14.4.1 prior to the issuance of a Notice to Proceed, the Contractor shall not be entitled to any compensation whatsoever.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. Neither a Request for Information, nor a Construction Change Directive, nor a Change Order, nor a reservation of rights, nor minutes of a meeting, nor a daily report, nor any log entry, nor an Owner's request for or the Contractor's response to a Change Order proposal, nor notice of a potential or future claim shall constitute a Claim.

§ 15.1.2 Time Limits on Claims

§ 15.1.2.1 Claims by the Contractor must be initiated by written notice to the Owner and the Initial Decision Maker. Claims by the Contractor must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the Contractor first recognizes the condition giving rise to the Claim, whichever is earlier.

§ 15.1.2.2 Written notice shall contain a heading stating "Notice of Claim" to clearly identify it as such. Such notice shall set forth in detail the circumstances that form the basis for the Claim and shall include the following: (1) a clear statement of claim matter, including background and chronology; (2) documentation in support of claim matter; (3) documentation in support of claimed damages; and (4) certification by responsible officer of claimant.

§ 15.1.2.3 The Owner shall not be liable to any Contractor or Subcontractor for damages caused by any breach of Contract, delay in performance or other act of neglect by other Contractors or Subcontractors having Contracts for performance of any portion of work.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by the Contractor must be initiated by written notice to the Owner and to the Architect with a copy sent to the Construction Manager within the time limits set forth in Section 15.1.2.1 above. The purpose of the written notice is to give the Owner prompt opportunity: (a) to cancel or revise orders or directions, change plans, mitigate or remedy circumstances giving rise to the Claim or to take other action that may be desirable; (b) to monitor and verify the facts and circumstances as they occur; and (c) to verify any costs and expenses claimed by the Contractor contemporaneously as they are incurred. Written notice is required whether or not the Owner, Construction Manager or Architect is aware of the facts or circumstances that constitute the basis for the Contractor's Claim, and no action or conduct of the Owner, Construction Manager, Architect or any other person will be regarded as a waiver of such notice requirement except only a written statement to such effect signed by the Owner. Failure of the Contractor to give written notice as required by this Section shall be deemed conclusively to be a waiver and release of any Claim, and such written notice shall be a condition precedent to the Contractor's right to make any Claim arising out of, under or in connection with the Contract or its performance of the Work.

§ 15.1.3.2 Written notice shall contain a heading stating "Notice of Claim" to clearly identify it as such. Such notice shall set forth in detail the circumstances that form the basis for the Claim and shall include the following: (1) a clear statement of the claim, including background and chronology; (2) documentation in support of the claim; (3) documentation in support of claimed damages; and (4) certification by responsible officer of the Contractor. The responsibility to substantiate Claims shall rest with the Contractor. An additional Claim arising from the same occurrence or condition made after the Initial Claim has been implemented by Change Order shall not be considered.

§ 15.1.3.3 The Contractor agrees that it has and will make no claim for damages against the Owner by reason of any act or failure to act by any other Contractor, Separate Contractor or Subcontractors having contracts for performance of any portion of work of the Project or in connection with the Owner's, Architect's or Construction Manager's acts or omissions to act in connection with such other Contractors, Separate Contractors or Subcontractors.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim by the Contractor, except as otherwise agreed in writing or as provided in Section 9.7, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments of undisputed amounts in accordance with the Contract Documents; provided, however, that the Contractor shall use its best efforts to furnish the Architect and Owner, as expeditiously as possible, with notice of any Claim including, without limitation, those in connection with concealed or unknown conditions, once such Claim is recognized, and shall cooperate with the Architect and the Owner in any effort to mitigate the alleged or potential damages, delay or other adverse consequences arising out of the condition which is the cause of such a Claim. The Construction Manager will prepare Change Orders and the Architect will issue a Certificate for Payment or Project Certificate for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost. If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.3. The Contractor agrees that an express condition precedent to the Contractor's entitlement to any increase in the Contract Sum shall be full and complete compliance to the satisfaction of the Owner with the requirements of Article 15. The Contractor acknowledges the no damages for delay provisions set forth in Sections 8.3.2 and 15.1.6.1.4 hereof.

§ 15.1.5.1 The Contractor shall not be entitled to any adjustment in the Contract Sum or Contract Time if:

.1 The Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner in respect of Contract Sum and Contract Times by the submission of a bid or becoming bound under a negotiated contract; or

.2 The existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test or study of the site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for the Contractor prior to Contractor's making such final commitment;

.3 The Contractor failed to give the written notice within the time and as required by Section 15.1.2; or

.4 If the Owner and the Contractor are unable to agree on entitlement to or as to the amount or length of any such equitable adjustment in the Contract Sum or Contract Times, a claim may be made therefore as provided in Article 15. However, the Owner, Construction Manager, and Architect shall not be liable to the Contractor for any claims, costs, losses or damages sustained by the Contractor on or in connection with any other project or anticipated project.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Sections 15.1.2 and 15.1.3 shall be given. The Contractor's Claim shall include an estimate of the probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary.

§ 15.1.6.1.1 An application for extension of time must set forth in detail the circumstances that form the basis for the Claim, the date upon which each cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work and the number of days' increase in the Contract Time claimed as a consequence of each such cause of delay. The Contractor shall provide such supporting documentation as the Owner, Construction Manager or Architect may require including, where appropriate, a revised construction schedule indicating all the activities affected by the circumstances forming the basis of the Claim for an increase in the Contract Time.

§ 15.1.6.1.2 The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which may have concurrent or interrelated effects on the progress of the Work, or for concurrent delays due to the fault of the Contractor.

§ 15.1.6.1.3 The Contractor agrees that an express condition precedent to the Contractor's entitlement to any extension of the Contract Time shall be full and complete compliance to the satisfaction of the Owner with the requirements of Articles 8 and 15.

§ 15.1.6.1.4 The Owner shall not be liable to the Contractor or any of its Subcontractor for claims, impact costs, extended general conditions, unabsorbed overhead or delay damages of any nature caused by or arising out of delay, disruption, interference, inefficiencies, impedance, hindrance, acceleration, resequencing, schedule impacts, lack of timeliness by the Owner or its Architect or Construction Manager, and lack of coordination or scheduling, cumulative impact of multiple change orders, errors or omissions in the design of the Project, delay and other

performance impacts. The sole remedy against the Owner for such delays shall be the allowance of additional time for completion of the Work, the amount of which shall be subject to the Claims procedure set forth herein. Except only in the case of the Owner's failure to provide access to the site of the Work such that the Contractor is wholly unable to perform the Work, which shall be the sole and exclusive exception to the no-damages-for-delay provision contained herein, the Contractor expressly agrees not to make and hereby waives any claim for damages for delay, including, but not limited to, those resulting from increased labor or material costs, extended general conditions, directions given or not given by the Owner, Construction Manager, or Architect, including scheduling and coordination of the Work; the Architect's preparation of drawings and specifications or the Construction Manager's or Architect's review of shop drawings and requests for instructions; errors or omissions in the design of the Project; or, on account of any delay, disruption, interference, impedance, inefficiency, lack of productivity, obstruction or hindrance for any cause whatsoever by the Owner, Construction Manager, Architect or any other Contractor or Separate Contractor on the Project, whether or not the delays or their causes or their length were foreseeable or contemplated by the parties when they entered into the Contract. The Contractor agrees that its sole right and remedy therefore shall be an extension of the Contract Time, if appropriate. It is emphasized that no monetary recovery may be obtained by the Contractor for delay against the Owner, Construction Manager, Architect, other Contractor or Separate Contractor based on any reason and that the Contractor's sole remedy, if appropriate, is additional time.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction. In planning his construction schedule within the agreed Contract Time, it shall be assumed that the Contractor has anticipated the amount of adverse weather conditions normal to the site of the Work for the season or seasons of the year involved. Only those weather delays attributable to other than normal weather conditions will be considered by the Architect.

§ 15.1.7 Waiver of Claims for Consequential Damages. The Contractor waives any and all claims for consequential damages of any kind and nature arising out of or relating to this Contract. This waiver includes, without limitation, damages incurred by the Contractor for principal office expenses including compensation for personnel stationed there, unabsorbed overhead, for losses of financing, business and reputation, and loss of profit and anticipated profit. This waiver of consequential damages shall survive termination of the Contract.

§ 15.2 Initial Decision

§ 15.2.1 Claims by the Contractor, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims by the Contractor excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to binding dispute resolution of any Claim. If an initial decision has not been rendered within 30 days after the Contractor's Claim has been referred to the Initial Decision Maker, the Contractor may proceed with binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims by the Contractor and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims by the Contractor, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim by the Contractor or to furnish additional supporting data, such party shall respond, within 10 days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be

furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim by the Contractor in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim by the Contractor, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect and Construction Manager, if the Architect or Construction Manager is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to binding dispute resolution.

§ 15.2.6 Intentionally omitted.

§ 15.2.6.1 Intentionally omitted.

§ 15.2.7 Intentionally omitted.

§ 15.2.8 If a Claim by the Contractor relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Dispute Resolution

§ 15.3.1 At the election of the Owner, the Owner and Contractor will attempt in good faith to resolve any controversy or claim arising out of or relating to the Contract, its breach, termination or validity through non-binding mediation and otherwise as set forth in this Section. Unless otherwise agreed, any mediation shall take place at the location of the Project.

§ 15.3.2 Should the Contractor seek to pursue any claim subject to this Section 15.3, the Contractor shall make a written demand to the Owner requesting that the Owner elect whether or not mediation is required. The written demand shall expressly reference this Section 15.3 and be addressed via Certified Mail, Return Receipt Requested, to the Superintendent of Schools for the Owner. The Owner shall respond in writing. If a writing is not post marked to, or otherwise received by, the Contractor within 15 business days of receipt by the Owner of such demand relating to mediation, the Owner shall be deemed to have elected to forgo mediation.

§ 15.3.3 If the controversy or claim has not been resolved pursuant to the mediation procedure within 60 days of the commencement of such procedure, or if the Owner elects not to participate in mediation, any further proceedings shall be via litigation, which litigation shall be venued exclusively in New York Supreme Court, County of Westchester.

§ 15.3.4 Wherever reference is made to arbitration in the Contract Documents, such reference shall be changed to refer to litigation.

§ 15.3.5 The Contractor shall carry on the Work and maintain its schedule during any proceeding under this article 15.

§ 15.3.6 The laws of the State of New York without reference to its conflicts of the law principles shall govern the Contract.

§ 15.3.7 In no event may a demand for mediation be made, or litigation filed, after the date when institution of legal or equitable proceedings based on such claim, dispute or other matter in question would be barred by the applicable statutes of limitations.

ARTICLE 16 SPECIAL CONDITIONS

§ 16.1 Equal Opportunity

§ 16.1.1 The Contractor shall maintain policies for equal employment opportunity for construction employment. During performance of the Agreement, the Contractor agrees as follows:

§ 16.1.2 The Contractor and its Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin. The Contractor shall take affirmative action to ensure that all applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex, or national origin. Such action shall include, but not be limited to, the following:

employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship and on-the-job training.

§ 16.1.3 The Contractor will post and keep posted in conspicuous places, for employees and applicants for employment, notices obtained by the Contractor from the New York State Division of Human Rights as set forth in the General Regulations of that Division at 9 NYCRR 466.1(a), such conspicuous places to be as defined in 9 NYCRR 466.1(b), and such other postings as that Division may require with respect to New York State's laws, codes, rules, and regulations governing discrimination in employment.

§ 16.1.4 The Contractor will state in all solicitations or advertisements for employees placed by, or on behalf, of the Contractor, that all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color or national origin.

§ 16.1.5 The Contractor will comply with provisions of Sections 290-299 of the Executive Law and with the Civil Rights Law, will furnish all information and reports deemed necessary by the State Commissioner of Human Rights under these non-discrimination clauses and such sections of the Executive Law, and will permit access to the Contractor's books, records and accounts by the Owner, the State Commissioner of Human Rights, the Attorney General and the Industrial Commissioner for the purposes of investigation to ascertain compliance with these nondiscrimination clauses and such sections of the Executive Law and Civil Rights Law.

§ 16.1.6 The Contractor will send to each labor union, or representatives of workers, with which it has, or is bound by a collective bargaining or other Agreement or understanding notices obtained from the State Commissioner of Human Rights, advising such Labor Union or representative of the Contractor's Agreement under requirements of this Article. If the Contractor was directed to do so by Owner as part of the Bid, the Contractor shall request such labor union or representative to furnish him with a written statement that such labor union or representative will not discriminate because of race, creed, color or national origin and that such labor union or representative either will affirmatively cooperate within the limits of its legal and contractual authority in the implementation of the policy and provisions of these non-discrimination clauses or that it consents and agrees that recruitment accordance with the purposes and provisions of these non-discrimination clauses. If such labor union or representative fails or refuses to comply with such a request that it furnish such a statement, the Contractor shall promptly notify the Owner and State Commissioner of Human Rights of such failure or refusal.

§ 16.1.7 The Agreement may be forthwith canceled, terminated or suspended in whole, or in part, by Owner upon the basis of a finding made by the State Division of Human Rights, that the Contractor has not complied with these non-discrimination clauses, and the Contractor may be declared ineligible for future Contracts made by, or in behalf of, the State, or Authority or Agency of the State, or Housing Authority or an Urban Renewal Agency, or Contracts requiring the approval of the Commissioner of Housing and Community Renewal, until it has satisfied the State Division of Human Rights, that it has established and is carrying out a program in conformity with the provisions of these non-discrimination clauses. Such findings shall be made by the State Division of Human Rights after conciliation efforts by the Division have failed to achieve compliance with these non-discrimination clauses and after a verified complaint has been filed with the Division, notice thereof has been given to the Contractor, and an opportunity has been afforded by the Contractor to be heard publicly in accordance with the Executive Law. Such sanctions may be imposed and remedies invoked immediately of, or in addition to sanction in remedies otherwise provided by law. If the Agreement is canceled or terminated under provisions of this Article, in addition to other rights of Owner provided in the Agreement upon its breach by the Contractor, the Contractor will hold Owner harmless against any additional expenses or costs incurred by Owner in completing the work or in purchasing the services, materials, equipment or supplies contemplated by Agreement and Owner may withhold payments from the Contractor in an amount sufficient for this purpose and recourse may be had against authority on the Performance Bond if necessary.

§ 16.1.8 The Contractor will include the provisions of this Article in every subcontract or purchase order in such a manner that such provisions will be binding upon each subcontractor or vendor as to operations to be performed within the State of New York. The Contractor will take such action in enforcing such provisions of such subcontractor or purchase order as the State Division of Human Rights or the Owner may direct, including sanctions or remedies for non-compliance. If the Contractor becomes involved in or is threatened with litigation with a subcontractor or a vendor, as a result of such direction by the State Division of Human Rights, the Contractor shall promptly so notify the Owner and the Attorney General, requesting the Attorney General to intervene and protect the interests of the State of New York.

§ 16.2 Waiver of Immunity

§ 16.2.1 The Contractor hereby agrees to the provisions of Paragraph 139-a and l39-b of the New York State Finance Law and Section 103-a of the New York General Municipal Law, which require that upon the refusal of a person, when called before a grand jury, head of a State department, temporary State commission or other State agency, or the organized crime task force in the Department of Law, which is empowered to compel the attendance of witnesses and examine them under oath, to testify in an investigation concerning any transaction or contract had with the State, any political subdivision thereof, a public authority or with any public department, agency or official of the State or of any political subdivision thereof or of a public authority, to sign a waiver of immunity against subsequent criminal prosecution or to answer any relevant question concerning such transaction or contract.

§ 16.2.1.1 Such person, and any firm, partnership or corporation of which he is a member, partner, director or officer shall be disqualified from thereafter selling to or submitting bids to or receiving awards from or entering into any contracts with New York State or any public department, agency or official thereof for goods, work or services, for a period of five years after such refusal.

§ 16.2.1.2 Any and all contracts made with the State of New York, or any public department, agency or official thereof since the effective date of this law, by such person, and by an firm, partnership or corporation of which he is a member, partner, director or officer may be canceled or terminated by the State of New York without incurring any penalty or damages on account of such cancellation or termination, but any moneys owning by the State of New York for goods delivered or work done prior to the cancellation or termination shall be paid.

§ 16.3 Non-Collusive Clause as Required by NYS General Municipal Law Section 103-d

§ 16.3.1 Every bid or proposal hereafter made to a political subdivision of the state or any public department, agency or official thereof where competitive bidding is required by statute, rule, regulation or local law, for work or services performed or to be performed or goods sold or to be sold, shall contain the following statement subscribed by the bidder and affirmed by such bidder as true under the penalties of perjury: Non-collusive bidding certification.

§ 16.3.2 By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief, the following:

§ 16.3.2.1 The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competitions, as to any matter relating to such prices with any other bidder or with any competitor.

§ 16.3.2.2 Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor.

§ 16.3.2.3 No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

§ 16.3.3 A bid shall not be considered for award nor shall any award be made where requirements of this Article have not been complied with; provided however, that in any case the bidder cannot make the foregoing certification, the bidder shall so state and shall furnish with the bid a signed statement which set forth in detail the reasons therefore. Where requirements of this Article have not been complied with, the bid shall not be considered for award nor shall any award by made unless the head of the purchasing agent of the political subdivision, public department, agency or official thereof to which the bid is made, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

§ 16.3.4 The fact that a bidder (a) has published price lists, rates, or tariffs covering items being procured, (b) has informed prospective customers of proposed, or pending, publication of new or revised price list for such items, or (c) has sold the same items to other customers at the same prices being bids, does not constitute a disclosure within the meaning of this Article.

§ 16.3.5 Any bid hereafter made to any political subdivision of the state or any public department, agency official thereof by a corporate bidder for work or services performed or to be performed or good sold or to be sold, where competitive bidding is required by statute, rule, regulation, or local law, and where such bid contains the certification referred to in subdivision one of this section, shall be deemed to have been authorized shall be deemed to in-

clude the signing and submission of the bid and the inclusion therein of the certificate as to non-collusion as the act and deed of the corporation.

§ 16.4 Assignment of Public Contracts

As provided in Section 109 of the General Municipal Law, the Contractor is prohibited from assigning, transferring, conveying, subletting or otherwise disposing of the same, or of his right title, or interest therein, or his power to execute such contract or any other person or corporation without the previous consent in writing of the officer, board or agency awarding the contract. If any contractor, to whom any contract is let, granted and awarded, as required by law, by any officer, board or agency in a political subdivision, or of any district therein, shall without the previous written consent specified in subdivision one of this section, assign, transfer, convey, sublet or otherwise dispose of such contract, or his right, title or interest therein, or his power to execute such contract, to any other person or corporation, the officer, board or agency which let, made, granted, or awarded such contract shall revoke and annul such contract, and the political subdivision or district therein, as the case may be, and such officer, board or agency shall be relieved and discharged form any and all liability and obligations growing out of such contract to such contractor, and to the person or corporation to which such contract shall have been assigned, transferred, conveyed, sublet or otherwise disposed of, and such contractor, and his assignees, transferees or sublessees shall forfeit and lose all moneys, theretofore earned under such contract, except so much as may be required to pay his employees. The provisions of this section shall not hinder, prevent, or affect an assignment by any such contractor for the benefit of his creditors made pursuant to the laws of this state.

§ 16.5 Fingerprinting

Pursuant to the Safe Schools Against Violence in Education Act ("SAVE" legislation) and Part 87 of the Regulations of the Commissioner of Education, any individual who, as a result of their work on this capital project, will move (or migrate) in and out of student occupied areas for more than five (5) days a year, must be fingerprinted. The Contractor shall be responsible to ensure that it (and its employees) are in full compliance with the fingerprinting provisions New York's SAVE Legislation and Part 87 of the Regulations of the Commissioner of Education at the Contractor's sole cost and expense.

ARTICLE 17 NEW YORK STATE LABOR LAW REQUIREMENTS

§ 17.1 Working Hours

§ 17.1.1 The Contractor specifically agrees as required by the New York State Labor Law ("Labor Law"), Sections 220 and 220-d, as amended, that:

- **.1** No laborer, worker, or mechanic in the employ of the Contractor, Subcontractor or other person doing or contracting to do the whole or any part of the work included in the Contract Documents shall be permitted or required to work more than eight hours in any one calendar day or more than five (5) days in any one week, except to the extent permitted in the case of extraordinary emergencies described in the Labor Law.
- **.2** The wages to be paid to each laborer, worker, or mechanic in the employ of the Contractor, Subcontractor, or other person doing or contracting to do all or any part of the work included in the Contract Documents for a legal day's work shall be not less than the prevailing rate of wages as defined by the Labor Law.
- **.3** Each laborer, workman or mechanic employed by the Contractor, a Subcontractor, or other person doing or contracting to do all or any part of the work included in the Contract Documents shall be provided the supplements required by Article 8 of the Labor Law.
- **.4** The minimum hourly rate of wage to be paid shall be not less than that stated in the General Conditions, and shall be as designated by the industrial Commissioner.
- **.5** The Contractor's and any Subcontractor's or other person's filing of payrolls in a manner prescribed by subdivision 3-a of Section 220 of the Labor Law shall be a condition precedent to the to the Owner's payment of any sums due and owing to the Contractor, Subcontractor or other party for work done on or with respect to the Project.

§ 17.2 Wage Rates

§ 17.2.1 The Contractor specifically agrees, as required by the Labor Law, that the Contract may be forfeited and no sum paid for any work done thereunder on a second conviction for willfully paying less than:

- **.1** the prevailing wage rates as provided in Labor Law Section 220(3) as amended, or,
- **.2** the minimum wage rates as provided in Labor Law Section 220-d, as amended.

§ 17.2.2 The Contractor shall comply with Prevailing Wage Rates as issued by the State of New York Department of Labor for the location and duration of this Project. Current wage rates for this project are included in the Project

Manual as part of the Contract Documents. The Contractor is responsible to regularly review "Prevailing Wage Schedules/Updates" available on the "Prevailing Wage/Public Work" link on State of New York Department of Labor "Business in New York" web page (www.labor.state.ny.gov) to identify and implement any applicable changes to Prevailing Wage Rates during the Project.

§ 17.2.3 The Contractor shall comply with all the requirements of the Labor Law Section 220-a, as amended, regarding mandatory submission of certified payroll records, which shall be included with each application for payment.

§ 17.3 Anti-Discrimination

§ 17.3.1 The Contractor specifically agrees, as required by the provisions of Section 220-e of the Labor Law, as amended, that:

.1 In the hiring of employees for the performance of work under the Contract or any subcontract hereunder, no contractor, subcontractor, nor any person acting on behalf of such contractor or subcontractor, shall be reason of race, creed, color, sexual orientation, or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the work to which the employment relates;

.2 No contractor, subcontractor, nor any person on its behalf, shall in any manner, discriminate or intimidate any employee hired for the performance of work under the contact on account of race, creed, color, sexual orientation, or national origin.

.3 There may be deducted from the amount payable to the Contractor by the Owner under the contract a penalty at fifty dollars for each person for each calendar day during which such person was discriminated against or intimidated in violation of the provisions of the contract; and

.4 The Contract may be canceled or terminated by the Owner, and all monies due or to become due thereunder may be forfeited for a second or any subsequent violation of the terms or conditions of this section of the Contract.

ARTICLE 18 GENERAL MUNICIPAL LAW REQUIREMENTS OF THE STATE OF NEW YORK

§ 18.1 Payment of Contractors and Subcontractors

§ 18.1.1 The Contractor specifically agrees it is bound by Section 106-b of the New York General Municipal Law.

ARTICLE 19 SPECIFIC CONFORMANCE TO THE LAWS OF THE STATE OF NEW YORK

§ 19.1 Statutory Requirements

§ 19.1.1 The parties agree that each is bound to the provisions of the laws of the State of New York governing bidding and contracting for public improvement projects, including but not limited to applicable provisions of the General Obligations Law, Labor Law, and General Municipal Law. To the extent any provisions in the Contract Documents conflict with any provisions of New York Law, the statutory provisions shall prevail and the conflicting provisions in the Contract Documents shall be deemed to conform to the statutory provisions.

§ 19.1.2 To the extent the laws of the State of New York governing bidding and contracting for public improvement projects mandate inclusion of specific terms in contracts for such improvements, but which are not already included in these General Conditions, such terms shall be deemed and hereby are incorporated into these General Conditions.

Bedford CSD

Greg O'Connor
187 Wolf Road
Suite 205
Albany NY 12205

Schedule Year	2022 through 2023
Date Requested	10/21/2022
PRC#	2022011943

Location	632 South Bedford Road
Project ID#	22-225
Project Type	Site work, general construction, mechanical construction, plumbing construction, and electrical construction

PREVAILING WAGE SCHEDULE FOR ARTICLE 8 PUBLIC WORK PROJECT

Attached is the current schedule(s) of the prevailing wage rates and prevailing hourly supplements for the project referenced above. A unique Prevailing Wage Case Number (PRC#) has been assigned to the schedule(s) for your project.

The schedule is effective from July 2022 through June 2023. All updates, corrections, posted on the 1st business day of each month, and future copies of the annual determination are available on the Department's website www.labor.ny.gov. Updated PDF copies of your schedule can be accessed by entering your assigned PRC# at the proper location on the website.

It is the responsibility of the contracting agency or its agent to annex and make part, the attached schedule, to the specifications for this project, when it is advertised for bids and /or to forward said schedules to the successful bidder(s), immediately upon receipt, in order to insure the proper payment of wages.

Please refer to the "General Provisions of Laws Covering Workers on Public Work Contracts" provided with this schedule, for the specific details relating to other responsibilities of the Department of Jurisdiction.

Upon completion or cancellation of this project, enter the required information and mail **OR** fax this form to the office shown at the bottom of this notice, **OR** fill out the electronic version via the NYSDOL website.

NOTICE OF COMPLETION / CANCELLATION OF PROJECT

Date Completed: _____ Date Cancelled: _____

Name & Title of Representative: _____

Phone: (518) 457-5589 Fax: (518) 485-1870
W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12240

GOVERNING LAWS

This project is governed by, but not limited to, the following laws:

-- General Municipal Law, Section 101, regarding separate contracts when total project exceeds $50,000.

-- General Municipal Law, Section 103-d, regarding non-collusive bidding clause.

-- General Municipal Law, Section 106-b, regarding payment of contractors and subcontractors.

-- General Municipal Law, Section 108, regarding Worker's Compensation Insurance.

-- General Municipal Law, Section 109, regarding non-assignment of public contract.

-- Labor Law, Section 220, subdivision 2, regarding 40-hour week, 8-hour day.

-- Labor Law, Section 220-d, regarding wage rates and supplements.

-- Labor Law, Section 220-3, regarding anti-discrimination.

-- Labor Law, Section 222-a, regarding elimination of dust hazard.

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01 07 00 - ABBREVIATIONS AND SYMBOLS

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section lists and defines various common abbreviations which are used throughout the Contract Documents.

B. Abbreviations of organizations and federal agencies which publish standards, codes, and regulations are defined in section 01060 - CODES AND STANDARDS.

C. Other abbreviations and symbols may be found in legends and elsewhere on the Drawings. Piping material abbreviations are contained in the piping sections.

D. Should an abbreviation or symbol not be specifically defined, it shall carry the standard definition commonly used in the industry.

E. Whenever any doubt arises as to what an abbreviation or symbol means, notify Engineer and he will issue a definition in writing.

1.02 ABBREVIATIONS

A. The following is a list of commonly used abbreviations which may be found in the Contract Documents, and the meanings ascribed to them:

A.C. or ac	Alternating Current
a or A	Amperes
AFF	Above Finished Floor
amp or Amp	Amperes
Alum.	Aluminum
Asph.	Asphalt
AWG.	American Wire Gauge
Aux.	Auxiliary
Bit. Conc.	Bituminous Concrete
CB	Circuit Breaker
Cl.	Class
cm	Centimeter
C.O.	Clean out
Conc.	Concrete
Cont.	Continuous
Cu.	Cubic
cc	Cubic Centimeters
C.F.	Cubic Feet
CFM or cfm	Cubic Feet Per Minute
CFS or cfs	Cubic Feet Per Second
C.Y.	Cubic Yards
CT	Current Transformer
D.C. or dc	Direct Current
DFT.	Dry Film Thickness

Dia.	Diameter
DWG. or Dwg.	Drawing
Dr.	Drive
Ea. or ea.	Each
EF	Each Face
EW	Each Way
Eff. or eff.	Efficiency
El. or Elev.	Elevation
Fin. Gr.	Finished Grade
fps	Feet Per Second
Ft. or ft.	Feet
ftg.	Footing
g.	Grams
Ga. or ga.	Gauge
Gal. or gal.	Gallon
Galv.	Galvanized
GPD or gpd	Gallons Per Day
GPM or gpm	Gallons Per Minute
H-O-A	Hand-off-automatic
Hz. or hz	Hertz
I.D.	Inside Diameter
Inv.	Invert
KVA or kva	Kilovolts-amperes
Kw or kw	Kilowatts
kwh or KWH	Kilowatt-hours
Lbs. or lbs.	Pounds
L.F.	Linear Feet
LPA	Lighting Panel "A"
L.S.	Lump Sum
m.	Meters
mA	Milliamperes
Max. or max.	Maximum
MCC	Motor Control Center
mg.	Milligrams
MGD or mgd	Million Gallons Per Day
mi.	Miles
Min. or min	Minimum
mm	Millimeters
No. or no.	Number
nom.	Nominal
N.T.S.	Not To Scale
O.D.	Outside Diameter
O & M	Operations and maintenance
Oz. or oz.	Ounce
pb	Pushbutton
PPD	Pounds Per Day
P/B	Pullbox
pri.	Primary
psf	Pounds Per Square Foot
psi	Pounds Per Square Inch,
psig	Pounds Per Square Inch, Gauge Pressure
PT	Potential Transformer
Pvt. or Pvmt.	Pavement
R.	Radius
R.O.W.	Right-of-Way

Sch.	Schedule
sec.	Secondary or Seconds
S.F.	Square Feet
S/S/P/	Stop-start-pilot Station
Std. or std.	Standard
S.Y.	Square Yards
T&B	Top and Bottom
Typ.	Typical
U.O.N.	Unless Otherwise Noted
U.V.	Ultraviolet
V or v	Volts
Vac or VAC	Alternating current Voltage
Vdc or VDC	Direct Current Voltage
V.F.	Vertical Feet
Vol.	Volume
W or w	Watts
Yd. or yd.	Yards

1.03 SYMBOLS

A. The following is a list of commonly used symbols which may be found in the Contract Documents, and the meanings ascribed to them:

P	Phase, Diameter, or Round (as applicable)
D	Degrees (F. = Fahrenheit C. = Centigrade)
'	Feet or Minutes
"	Inches or Seconds
#	Number or Pound
/	Per or Divided by

PART 2 - EXECUTION

(NOT UTILIZED)

PART 3 - EXECUTION

(NOT UTILIZED)

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01 08 50 - APPLICABLE STANDARDS

PART ONE - GENERAL

1.01 GENERAL:

A. Work included:

1. Throughout the Contract Documents, reference is made to codes and standards which establish qualities and type of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics.

2. Where materials or workmanship are required by these Contract Documents to meet or exceed the specifically named code or standard, it is the Contractor's responsibility to provide materials and workmanship, which meet or exceed the specifically named code or standard.

3. It is also the Contractor's responsibility, when so required by the Contract Documents or by written request from the Architect, to deliver to the Architect all required proof that the materials or workmanship, or both, meet or exceed the requirements of the specifically named code or standard. Such proof shall be in the form requested in writing by the Architect, and generally will be required to be copies of a certified report of tests conducted by a testing agency approved for that purpose by the Architect.

1.02 QUALITY ASSURANCE:

A. Familiarity with pertinent codes and standards: In procuring all items used in this work, it is the Contractor's responsibility to verify the detailed requirements of the specifically named codes and standards and to verify that the items procured for use in this work meet or exceed the specified requirements.

B. Rejection of non-complying items: The Architect reserves the right to reject items incorporated into the Work, which fail to meet the specified minimum requirements. The Architect further reserves the right, and without prejudice to other recourse the Architect may take, to accept non-complying items subject to and adjustment in the Contract Amount as approved by the Architect and the Owner.

C. Applicable standards listed in these Specifications include, but not necessarily limited to, standards promulgated by the following agencies and organizations:

1. AASHTO: American Association of State Highway and Transportation Officials, 342 National Press Building, Washington, D.C. 20004.

2. ACI: American Concrete Institute, Box 19150, Redford Station, Detroit, MI 48129.

3. AISC: American Institute of Steel Construction, Inc., 1221 Avenue of the Americas, New York, NY 10020.

4. ANSI: American national Standards Institute (successor to USASI and ASA), 1430 Broadway, New York, NY 10018.
5. ASTM: American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

6. AWS: American Welding Society, Inc., 2501 N. W. 7th Street, Miami, FL 33125.

7. AWWA: American Water Works Association, Inc., 6666 West Quincy Avenue, Denver, CO 80235.

8. CRSI: Concrete Reinforcing Steel Institute, 228 North LaSalle Street, Chicago, IL 60610.

9. CS: Commercial Standard of NBS, J.S., Department of Commerce Government Printing Office, Washington, D.C. 20402.

10. DHHS: Department of Health and Human Services, 26 Federal Plaza, New York, NY 10007 (212) 264-2560

11. EPA: Environmental Protection Agency Region II, 26 Federal Plaza, NY, NY 10007 Asbestos Coordinator – Room 802 (212) 264-7307

    Part 61, Sub-Part M
    National Air Emissions Standards for Hazardous
    Air Pollutants (NESHAP)
    40 CFR Paret 763, Subpart E
    Asbestos Hazard Emergency Response Act (AHERA)

12. FED. SPECS.: Specifications Sales (3F21) Bldg. 197, Washington Navy Yard, GS, Washington, DE 20407

13. FGMA: Flat Glass Marketing Association, 3310

14. NAAMM: National Association of Architectural Metal Manufacturers, 1033 South Boulevard, Oak Park, IL 60302.

15. NEC: National Electrical Code (see NFPA).

16. NEMA: National Electrical Manufacturers Association, 155 East 44th Street, New York, NY 10017.

17. NFPA: National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

18. NIOSH: National Institute for Occupational Safety and Health, 26 Federal Plaza, New York, NY 10007, (212) 264-2485

19. OSHA: Occupational Safety/Health Administration, New York Regional Office, 1515 Broadway, NY, NY 10036, Room 3445 (212) 944-3426

20. SDI: Steel Deck Institute, 135 Addison Avenue, Elmhurst, IL 60125.

21. SED/SLD: State Education Department and State Labor Department

22. SSPC: Steel Structures Painting Council, 4400 5th Avenue, Pittsburgh, PA 15213.

23. TCA: Tile Council of America, Inc., P. O. Box 326, Princeton, NJ 08540.
24. UL: Underwriters' Laboratories, Inc., 207 East Ohio Street, Chicago, IL 60611.

25. Fed Specs and Fed Standards: Specifications Sales (3FRI), Bldg. 197, Washington Navy Yard, General Services Administration, Washington, D.C. 20407.

26. MIL-SPECS: Military Specifications, Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402.

27. UBC: Uniform Building Code, International Conference of Building Officials, 5360 South Workman Mill Road, Whittier, CA 90601.

END OF SECTION

SECTION 01 10 00 - SUMMARY OF WORK - MULTIPLE PRIME CONTRACTS

GENERAL

1.1 PROJECT INFORMATION

A. Project: Bedford Central School District Phase 1A
B. Project Location: Bedford, NY
C. Owner: Bedford Central School District
D. Architect: BBS Architects & Design
E. Construction Manager: Arris Contracting Company, Inc.
F. The overall scope of work includes: new doors and entrance doors at High School ,Middle school interior doors and outdoor play area renovation, security upgrades in elementary schools, a principal's room addition with associated structural, mechanical, electrical. New clocks, PA and telephone upgrades. All prime contractors are required to actively coordinate and sequence with other contractors and the owner provided items to ensure accuracy of the installations and a smooth flow of work.

   The contractor shall provide all labor, materials, equipment and services to furnish deliver and install all materials and related work as shown on the drawings, as required by these specifications and/or as directed by the Architect/Construction Manager.

G. Contracts:
   1. The Project will be constructed under a multiple prime-contracting arrangement.
   2. Prime Contracts are separate contracts between the Owner and separate contractors, representing significant construction activities. Each prime contract is performed concurrently with and closely coordinated with construction activities performed on the Project under prime contracts. Prime contracts for this Project include:
      a. General Work Contract. (GC or GWC) - Contract # 1
      b. Mechanical Work Contract. (MC, HVAC or HC) - Contract # 2
      c. Electrical Work Contract. (EC) – Contract # 3

1.2 DIVISION OF WORK

A. Each contract shall include all labor materials, plans, tools, equipment and supervision which are required for or incidental to the proper completion of the work as indicated on the drawings and described in the following specification sections:

1.3 GENERAL REQUIREMENTS – ALL CONTRACTS

DIVISION 0 - BIDDING DOCUMENTS, CONTRACTS AND CONDITIONS

A. Cover Page
B. Table of Contents

C. Project Directory
D. Asbestos Handling Certificate
E. Conditions of This Contract
F. Invitation to Bidders
G. Instructions to Bidders
H. Information Available to Bidders
I. Bid Proposal Form
J. Proposed Equivalent Form
K. Proposed Substitution Form
L. Certification of Compliance with the Iran Divestment Act
M. Declaration of Bidder's Inability to Provide Certification of Compliance with the Iran Divestment Act
N. Iran Divestment ACT Compliance Rider
O. Statement of Bidder's Qualifications
P. Bond Forms - A.I.A. Document A312
Q. Standard Form of Agreement - A.I.A. Document A132
R. Requisition Form - A.I.A. Documents G732 and G703
S. Insurance Forms - A.I.A. Document G715, Accord Form Sample and Additional Insured Endorsements & Affidavit, Insurance certification form, sexual harassment prevention certification form.
T. Closeout Documents - A.I.A. Documents G706, G706A, G707, G707A
U. General Conditions of Contract - A.I.A. Document A232
V. Not Used
W. Prevailing Wage Rates
X. Governing Laws
Y. Specification Sections

DIVISION 01 – GENERAL REQUIREMENTS

01 07 00 ABBREVIATIONS AND SYMBOLS
01 08 50 APPLICABLE STANDARDS
01 10 00 SUMMARY OF WORK – MUTLI PRIME CONTRACT
01 11 00 MILESTONE SCHEDULE
01 21 00 ALLOWANCES
01 22 00 UNIT PRICES
01 23 00 ALTERNATES
01 23 10 CONTRACT PHASE CLARIFICATIONS
01 26 00 CONTRACT MODIFICATION PROCEDURES
01 29 00 PAYMENT PROCEDURES
01 31 00 PROJECT MANAGEMENT AND COORDINATION
01 31 19 PROJECT MEETINGS
01 31 50 COVID-19 CONTRACTOR COMPLIANCE
01 32 16 CONSTRUCTION PROGRESS SCHEDULE
01 33 00 ELECTRONIC SUBMITTAL PROCEDURES
01 33 02 SUBMITTAL COVER PAGE
01 45 00 QUALITY REQUIREMENTS
01 45 29 TESTING LABORATORY SERVICES
01 45 33 SPECIAL INSPECTIONS AND STRUCTURAL TESTING
01 50 00 TEMPORARY FACILITIES AND CONTROLS
01 51 00 UNIFORM SAFETY STANDARDS FOR SCHOOL CONSTRUCTION
01 55 00 SELECTIVE DEMOLITION
01 73 29 CUTTING AND PATCHING
01 74 23 CLEANING UP
01 77 00 CLOSEOUT PROCEDURES
01 77 01 CHECKLIST FOR PROJECT CLOSEOUT

01 77 02 CONFORMED CONSTRUCTION DOCUMENTS (AS-BUILTS)
01 78 36 WARRANTIES

1.4 CONTRACT # 1 – GENERAL WORK CONTRACT (GWC or GC)

In addition to the General Requirements, Division 1, included in this bid package contractor shall provide for proper completion of work as indicated on all drawings and in accordance with the terms and conditions described in the following specification sections :

DIVISION 1A - ASBESTOS

Section 01 61 00 – Asbestos Abatement
Section 01 61 20 – Methods of Removal & Temporary Enclosure
Section 01 61 30 – Asbestos Removal
Section 01 61 40 – Air Monitoring
Section 01 61 50 – Project Decontamination
Section 01 61 60 – Clean-Up Procedures
Section 01 61 70 – Monitoring & Supervision
Section 01 61 80 – Removal of Asbestos Contaminated Substrate Material – Scrape Method

DIVISION 2 SITE WORK & EXISTING CONDITIONS

Section 02000 – Site Work General Provisions
Section 02081 – Asbestos Abatement
Section 02200 – Earth Work
Section 02530 – Athletic Court Surfacing
Section 02550 – Bluestone Pavers
Section 02600 – Hot Mix Asphalt (HMA) Pavement System
Section 02801 – Topsoil, Lawns and Grasses
Section 02832 – Vinyl Coated Chain Link Fencing

DIVISION 3 – CONCRETE

Section 03300 - Cast-in-Place Concrete Work
Section 03650 – Self-Leveling Cementitious Underlayment

DIVISION 4 – MASONRY

Section 04102 – Natural Stone Repair & Repointing
Section 04200 - Unit Masonry Section
Section 04500 - Masonry Restoration and Cleaning
Section 04700 – Simulated Stone Veneer
Section 04720 – Architectural Cast Stone

DIVISION 5 – METALS

Section 05100 - Structural Steel
Section 05300 - Metal Decking

Section 05400 – Cold-Formed Metal Framing
Section 05500 – Miscellaneous Metal

DIVISION 6 - WOODS AND PLASTICS

Section 06100 - Rough Carpentry
Section 06200 - Finish Carpentry

DIVISION 7- THERMAL AND MOISTURE PROTECTION

Section 07190 – Under Slab Vapor Barrier
Section 07200 - Building Insulation
Section 07271 – Self-Adhered Non-Permeable Aire Barrier Membrane
Section 07530 – EPDM Roofing System
Section 07602 - Flashing
Section 07800 - Roof Accessories
Section 07900 - Caulking
Section 07910 - Joint Sealers

DIVISION 8 – OPENINGS

Section 08110 - Steel Doors and Frames
Section 08211 - Flush Wood Doors
Section 08306 – Fire Rated Access Doors
Section 08330 – Roll-Up Door Coiling Fire Doors
Section 08410 – Aluminum Entrances and Storefronts
Section 08411 – Aluminum Security Framed Entrances and Store Fronts
Section 08520 – Aluminum Windows (Insulated Glass)
Section 08525 – Transaction Window
Section 08631 - Aluminum Clad Windows
Section 08710 - Finish Hardware
Section 08800 - Glass and Glazing
Section 08806 – Fire Rated Glazing
Section 08870 – Security Window Film
Section 08930 – Metal Glazing Panels

DIVISION 9 – FINISHES

Section 09250 - Gypsum Wall Board
Section 09510 - Acoustic Ceiling Systems (2x4 or 2x2 Suspended Tile)
Section 09650 - Resilient Flooring
Section 09680 - Carpeting
Section 09900 – Painting

DIVISIONS 10 – 13
Not used

DIVISIONS 14 – CONVEYING SYSTEMS

Section 14226 - Incline Wheelchair Lift

Special Notes: Contract # 1 – General Work Contractor:

1. Work hours M-F 7:00AM – 4:30PM. Contractor will appropriately

man the project to avoid Saturday and Overtime hours which result in Owner, Construction Manager and Architect additional costs.

2. All exterior site work at elementary schools and Middle School Outdoor Shelter (asphalt, coating, fencing, etc.) is by the General Contractor # 1.
3. All asbestos abatement work is by GC Contract # 1
4. Each prime contractor to include all required insurance coverages as outlined by the General Conditions and front end sections in their base bid. Provide renewals ahead of expiration. No contractors will be allowed onsite if their insurance has expired.
5. General Work Contractor will install sleeves in foundation walls for penetrations by other prime contractors. MEP contractors to provide GWC with written sketch showing exact height/location(s) with distance from column line and depth below finished slab, within sufficient time for GWC to install. (If information is not provided timely by MEP, then core drilling is the responsibility of the affected contractor).
6. All concrete slabs are to receive Vaporlock 20/20 additive (or equal) to enable floor finishes to be installed without slab moisture issues.
7. Access doors for MEP trades furnished by trade requiring access; installation by Contract # 1 – General Work Contractor.
8. General Work Contractor will coordinate MEP opening sizes and locations (HVAC units, louvers, vents, etc.) with MEP trades. Lintels for these opening provided and installed by Contract # 1 – General Work Contractor.
9. General Work Contractor will remove any fixed casework in the Mt Kisco rooms scheduled for floor replacement and then reinstall after the new flooring work is completed.
10. Fire Alarm magnetic holders furnished and wired by Electrical contractor, Installed on door by Contract # 1 – General Work Contractor.
11. In addition to daily general housekeeping, the General Work Contractor (Contract #1) shall provide a weekly broom sweep and damp mop of all areas for the entire duration of the project.
12. All new roof curbs to be supplied, assembled and placed on roof by MC. General Work Contractor will cut hole, install steel frame, install wood blocking & flash for watertight installation.
13. General Work Contractor will install floor protections (utilizing heavy duty “Ram-Board” with taped joints, or equivalent) to protect new floor surfaces from damage until

final cleaning and acceptance by owner.

14. Contractor is specifically reminded of their responsibilities for clean up as per Section 017423. Maintaining a clean jobsite is considered a safety issue and will be strictly enforced. In addition to daily cleaning, the contractor is required to hire a professional cleaning company to final clean all areas impacted by the construction. This includes completely cleaning any surfaces/equipment/furniture which has been dusted by the construction work. If the contractor does not properly perform this function when directed by the Owner/CM, within 4 hours of being notified the owner will perform the work with others and deduct the cost from the contractor.

1.5 CONTRACT #2 – MECHANICAL WORK CONTRACT (MC)

In addition to the General Requirements, Division 1, included in this bid package contractor shall provide for proper completion of work as indicated on all drawings and in accordance with the terms and conditions described in the following specification sections:

DIVISION 8 - DOORS AND WINDOWS

Section 08306 – Fire Rated Access Doors

DIVISION 15 – HEATING, VENTILATING AND AIR CONDITIONING (HVAC)

15010 – General Mechanical Requirements
15014 – Codes, Standards, and Permits
15050 – Basic Mechanical Materials and Methods
15100 – Valves
15135 – Thermometers and Gages
15182 – Steam & Condensate Piping
15510 – Hot Water Piping
15530 – Refrigeration Piping Systems
15650 – Heating, Ventilating, and Air Conditioning
15656 – Temperature Control Systems
15657 - Electrical work
15802 – Inspection, Testing & Balancing
15806 – Fire Dampers
15895 – Diffusers, Registers, & Grilles
15903 – Automatic Temperature Controls
15990 – HVAC Testing Adjusting and Balancing
15997 – Mechanical Testing Requirements

DIVISION 16 – ELECTRICAL

16100 Basic Materials and Methods (for HVAC control wiring only)

Special Notes: Contract # 2 – Mechanical (MC) Work Contractor:

1. Work hours M-F 7:00AM – 4:30PM. Contractor will appropriately man the project to avoid Saturday and Overtime hours which result in Owner, Construction Manager and Architect additional costs.
2. Each prime contractor to include all required insurance coverages as outlined by the General Conditions and front end sections in their base bid. Provide renewals ahead of expiration. No contractors will be allowed onsite if their insurance has expired.
3. Access doors are furnished by Mechanical Contract # 2 and installed by GWC Contract # 1.
4. All HVAC Louvers/vents are supplied and installed by Mechanical Contract # 2. MC will coordinate opening sizes with GWC (Openings /Lintels by GWC).
5. All new roof curbs to be supplied, assembled and placed on roof by Mechanical Contractor. (GWC will cut hole where located by MC, install steel frame, install wood blocking, flash and provide watertight installation).
6. VFD's, disconnects, starters, etc. supplied by Mechanical Contract will be installed by EC, unless noted otherwise.
6. All HVAC control wiring is provided and installed by Mechanical Contract # 2. (Power wiring by EC)
7. Mechanical Contract # 2 is responsible for making their own through wall and through floor duct/piping penetrations and associated patching/fire-stopping.
8. Fire Alarm Duct detectors supplied and wired by EC (Mechanical Contractor installs the duct detector)
9. Contractor is specifically reminded about their responsibilities for clean-up as per section 017423. Maintaining a clean jobsite is considered a safety issue and will be strictly enforced. In addition to daily cleaning, the contractor is required to hire a professional cleaning company to final clean all areas impacted by the construction. This includes completely cleaning any surfaces/equipment/furniture which has been dusted by the construction work. If the contractor does not properly perform this function when directed by the Owner/CM within 4 hours of being notified the owner will perform the work with others and deduct the cost from the contractor.

1.6 CONTRACT #3 – ELECTRICAL WORK CONTRACT (EC)

In addition to the General Requirements, Division 1, included in

this bid package contractor shall provide for proper completion of work as indicated on all drawings and in accordance with the terms and conditions described in the following specification sections.

DIVISION 2 – SITE WORK

Section 02000 – Site Work General Provisions (for Electrical U/G work)
Section 02200 – Earth Work (for Electrical U/G work)
Section 02801 – Topsoil, Lawns and Grasses (for any areas disturbed by Electrical work)

DIVISION 3 – CONCRETE

Section 03300 - CAST IN PLACE CONCRETE (for electrical related work, pads, conduit encasement, site light bases etc.).

DIVISION 8 - DOORS AND WINDOWS

Section 08306 – Fire Rated Access Doors

DIVISION 26 – ELECTRICAL

Section 16010 – General Provisions
Section 16060 – Grounding and Bonding
Section 16100 – Basic Materials and Methods
Section 16502 – LED Interior Lighting
Section 16511 – Firestopping
Section 16707 – Public Address Sound System
Section 16720 – Fire Alarm System – Expand Existing System
Section 16735 – Wireless Clock System
Section 16995 – Electrical Systems Commissioning

Special Notes: Contract # 3 – Electrical Work Contract (EC)

1. Work hours M-F 7:00AM – 4:30PM. Contractor will appropriately man the project to avoid Saturday and Overtime hours which result in Owner, Construction Manager and Architect additional costs.

2. Each prime contractor to include all required insurance coverages as outlined by the General Conditions and front end sections in their base bid. Provide renewals ahead of expiration. No contractors will be allowed onsite if their insurance has expired.

3. Access doors if needed for electrical are furnished by Electrical Contract # 3 and installed by GC Contract # 1.

4. VFD's, disconnects, motor starters, etc. which are supplied by MC will be installed by Electrical Contractor, unless noted otherwise.

5. All Excavation / Backfill for electrical items (service conduits, U/G conduits, pull boxes, site lighting bases,etc.) is by Electrical Contract # 3. This includes proper backfill, compaction and restoration to original condition for any impacted surfaces.

6. Electrical Contractor to provide GWC with any foundation sleeves and written sketch showing exact height/location(s) with distance from column line and depth below finished slab,within sufficient time for GWC to install. (If information is not provided by EC in time, then core drilling is the responsibility of the EC)

7. Electrical Contract # 3 will relocate existing utilities which are in conflict with the new construction (e.g. – Bedford Hills Elementary overhead lines to building in conflict with new principal's office, etc).

8. Fire Alarm magnetic holders furnished and wired by Electrical contract # 3, Installed on door by GWC Contract #1.

9. All systems work is by Electric Contract # 3 – including Fire Alarm, Security, PA system Door hardware, etc. (This includes removal and reinstallation of any devices impacted by new construction work).

10. Any wood blocking or panel backboards for electrical items by EC contract # 3.

11. All Concrete for electrical items is by Electrical Contract #3 (Site Lighting bases, conduit encasement, etc.)

12. Electrical Contract # 3 to provide any wire Fire Alarm duct detectors

13. Electrical Contractor is specifically notified construction is phased which necessitates that utilities & services will need to be temporarily connected and maintained as necessary to ensure that all occupied areas have the required services.

14. Contractor is specifically reminded about their responsibilities for clean-up as per section 017423. Maintaining a clean jobsite is considered a safety issue and will be strictly enforced. In addition to daily cleaning, the contractor is required to hire a professional cleaning company to final clean all areas impacted by the construction. This includes completely cleaning any surfaces/equipment/furniture which has been dusted by the construction work. If the contractor does not properly perform this function when directed by the Owner/CM within 4 hours of being notified the owner will perform the work with others and deduct the cost

from the contractor.

1.7 PRIME CONTRACTOR'S USE OF PREMISES

Use of the Site: Limit use of the premises to work in areas indicated. Confine operations areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the work is indicated.

Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.

Existing building spaces may not be used for storage unless approved by the CM and Owner.

Time Restrictions: Working hours M-F 7:00AM – 4:30PM.

Owner's representative(s) will cover the project for the standard Monday-Friday shift. If contractor requests additional hours to make up schedule time or weekends, he will need to reimburse owner for any additional coverage or costs (e.g. – Architect, Construction Manager, etc.) at their contractual rate.

General: Limitations on site usage as well as specific requirements that impact utilization are indicated on the drawings and by other contract documents. In addition to these limitations and requirements, the Contractor shall administer allocation of available space equitably among the separate sub contactors and other entities needing access and space, so as to produce the best overall efficiency in performance of the total work of the project. The Contractor shall schedule deliveries so as to minimize space and time requirements for storage of materials and equipment on site.

After equipment is no longer required for the work, it shall be promptly removed from the project site. Protection of construction materials and equipment stored at the project site from weather, theft, damage and all other adversity is solely the responsibility of the Contractors.

Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary, obtain and pay for such storage off-site.

The Contractor(s) and any entity for which the Contractor is responsible shall not erect any sign of the Project site without the prior written consent of the Owner, which may be withheld in the sole discretion of the Owner.

Contractor shall ensure that the work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the work and all adjacent areas. The work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the site of the work shall be free from all debris, building materials and equipment likely to cause hazardous conditions. Without limitation of any other provision of the Contract Documents, contractor shall use its best efforts to minimize any interference with the occupancy or beneficial use of: Any areas and buildings adjacent to the site of the work or; The Building in the event of partial occupancy.

Maintain the building in a safe and weathertight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building during the construction period.

Each Prime contractor is responsible for maintaining a safe jobsite. This include actively reviewing their work areas to ensure that they are in compliance with all required OHSA regulations. It is a contract requirement that each contractor conducts weekly tool-box safety meetings to ensure that their employees are properly educated and utilizing safe work practices. (Copies of these weekly meetings and a list of the attendees will be forwarded to the CM site superintendent on a weekly basis). Contractors will comply with all requirements outlined in the General Conditions including providing their employees with PPE (personal protective equipment), such as masks, hand sanitizer for COVID, hard hats, proper work boots, safety harness, safety glasses, etc.

Smoking, drinking of alcoholic beverages or open fires will not be permitted on the project site.

Utility Outages and Shutdown:

a. Limit disruption of utility services to hours the building is unoccupied, weekends or holidays at no additional cost.
b. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days' notice to Bedford CSD and authorities having jurisdiction.
c. Prevent accidental disruption of utility services to other facilities.
d. All costs for manning of temporary shutdowns and utility crossovers, including 24-hour fire watch if necessary, is included in the contractor's bid regardless of weekend, holiday, etc.

1.8 OCCUPANCY REQUIREMENTS

Partial owner Occupancy: The Owner reserves the right to occupy the place and install equipment in completed areas of the work prior to Substantial Completion, provided such occupancy does not interfere with completion of the Work, such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.

The Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner occupancy.

Obtain a Certificate of Occupancy from local building officials prior to Owner occupancy.

Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy, the Owner will operate and maintain mechanical and electrical systems serving occupied portions of the building.

Upon occupancy, the Owner will assume responsibility for maintenance and custodial service for occupied portions of the building.

1.9 Not used

1.10 DEFINITIONS

Definitions as applied to "Contractors" involved with the work of this Project:

"The Contractor" or "Contractor" meaning that Respective Prime Contractor normally responsible for that work referenced;

"Respective Prime Contractor" meaning either the – General Contractor, Plumbing, HVAC , Electrical , Sitework, Fire Protection Contractors normally responsible for the referenced work;

"Trade Contractor" meaning that Respective Prime Contractor as above; and such other terms relating to Contractors to be taken in context with respect to referenced work.

Further, wherein said Division 0 and 1 and respective Sections therein, any reference is made to "General Contractor", same shall be construed to mean "Contractor for the General Construction, or General Work Contractor".

The Owner cannot guarantee the correctness of the existing conditions shown and assumes no responsibility therefore, it

shall be the responsibility of the Contractor to visit the site and verify all existing conditions prior to bid.

The Owner will purchase certain items required for the overall operation of this facility through outside vendors.

The Contractor(s) will cooperate with said vendors as may be necessary to permit the work to be accomplished.

a. The cooperation may extend to the receiving, unloading and placement of said equipment if directed by the Owner.
b. Each Contractor is advised that the Owner may enter into separate contracts as may be in their best interest.
c. Each Contractor is further advised that there will be a full on-site Project Representative / Construction Manager, whose duties will be defined at the pre-construction meeting.

ADDITIONAL SECURITY PROVISIONS.

1. All Contractors' employees shall use a single means of access and egress, except in the case of emergency, to be designated by the Construction Manager.

2. Each Contractor and each Subcontractor shall require his employees, while on the job site, to wear, in a conspicuous location, a photo I.D. button bearing the name of the employee and the Contractor. The buttons of each Contractor shall be numbered consecutively. An up-to-date list of all I.D. buttons, indicating the name and number for each employee, shall be furnished to the Construction Manager.

1.12 ASBESTOS AND LEAD PAINT AWARENESS REQUIREMENTS

Contractor agrees not to use or permit the use of any asbestos containing material in or on any property belonging to the Owner.

For purposes of this requirement, asbestos free shall mean free from all forms of asbestos, including - actinolite, amosite, anthrophyhllite, chrysotile, cricidolite and tremolite, both in friable and non-friable states and without regard to the purposes for which such material is used.

1.13 CONSTRUCTION TIME AND PHASING REQUIREMENTS

Each Contractor is advised the "time is of the essence" of the Contract as defined in the "General Conditions" for the completion of the construction of the facility.
It is understood that the work is to be carried through to completion with the utmost speed consistent with good workmanship.

Time of Completion shall be as established in the Milestone Schedules (Section 011100).

The Contractor shall maintain fences and barricades at all times and shall repair/ restore and/ or pay for any temporary fencing damaged by their work.

Maintain at all times, all exits and walkways.

Where the barricade is removed for work, the Contractor performing such work shall provide adequate safety personnel to prevent unauthorized persons from approaching the work area.

Construction Phasing

The phasing and/ or milestone schedule contained in Section 011100 has been established for the overall construction of the project.

Electrical and mechanical services to the functioning spaces shall be maintained at all times.

Swing-overs to new facilities shall be made so as to cause the least interruption to the facilities' operations.

1. The Contractor shall provide and maintain all required separations between old and new construction to prevent: Unauthorized entrance to construction areas by others than Architect, Construction Manager, or Owner, heat loss from existing building, water (rain or ground) infiltration into existing building.
2. Exterior alteration and restoration, as required, may proceed outside of phasing schedule at the Contractor's option with concurrence from the Architect, Construction Manager and Owner.
3. Site development work shall proceed in such a manner to cause the least amount of disruption to the ongoing operations as possible.

1.14 PROOF OF ORDERS, DELIVERY DATES AND SUPPLY CHAIN TRACKING - Coordinate with Sections 013300 and 013216.

Within 2 weeks after the approval of shop drawings, samples, product data and the like, the Contractor shall provide copies of purchase orders for all equipment and materials which are not available in local stock. The Contractor shall submit written statements from suppliers confirming the orders and stating promised delivery dates. Failure to provide this critical information will result in Owner holding monthly requisition payments until received.

Due to COVID-19 and it's potential to disrupt material supply-chains, the contractors are required to obtain all materials for the project and store them onsite in their individually provided Conex boxes. This includes general material items typically readily available (piping,

conduits, wire, metal studs, etc.). The owner will pay for these stored items delivered to the jobsite in accordance with Section 012900.

This information shall be incorporated within the progress schedules so required as part of Section 013216 and 013300 and shall be monitored so as to ensure compliance with promised dates.

1.15 FIELD MEASUREMENTS

Each Respective Contractor shall take all necessary field measurements prior to fabrication and installation of work and shall assume complete responsibility for accuracy of same.

1.16 INITIAL SUBMITTAL REQUIREMENTS

As outlined in Division 01, each Contractor shall provide items noted including - bonds, insurance, emergency telephone numbers, progress scheduling, schedules of submittals, subcontractor listings and the like prior to the start of any work. The owner will not issue contracts until all bonds and insurance information is received by the contractor and verified correct.

1.17 SCHEDULES

The milestone schedule presented in the documents is for bidding and general purposes. Due to the nature of the work, it is the intention of the Construction Manager to negotiate actual work periods for the project among the various Prime Contractors involved with this bidding process, as well as separate contractors involved with other phases of the work solicited under separate proposals. Each Contractor shall, under terms of the General Conditions, mutually cooperate in the rescheduling of work to permit an uninterrupted use of the facilities by the Owner, without additional cost to the Owner.
General:

1. The objective of this project is to complete the overall work in the shortest period of time and to protect the building and occupants from damages caused by weather and construction activity during the progress of the work.
2. To meet these objectives, the Contractor shall plan the work, obtain materials, and execute the construction in the most expeditious manner possible in accordance with the requirements listed below.
3. If the Contractor fails to expedite and pursue any part of the work, the Owner may terminate the contract or may carry out the work with others per the General Conditions.
4. The Contractor shall work in coordination with work of other

Contractors and Owner

5. All contractors are required to comply with proper sequencing of work and provide other prime contractors sufficient time to install their work (e/g/-metal stud walls get fully framed; MEP contractors perform roughing/testing/inspections; then walls are sheathed with gypsum – no sheetrocking one side unless CM approved). If contractor "boxes out" another prime contractor, he will be directed to stop work and open if necessary, to enable other trades to complete their work. No compensation for lost time due to stop-work will be provided.

Milestone Schedule (See Section 01 11 00).

1.18 ADDITIONAL REQUIREMENTS

The following are additional general and special requirements which will govern the work of the projects covered by these Documents.

1. If it appears that some of the work cannot be completed by the scheduled date, the Contractor shall increase the work force or increase the hours of work, including evenings and weekends as necessary, and cover any additional costs to the Owner, architect and Construction Manager.
2. If the work is complete but the area is not cleaned and debris or equipment is not removed, the Owner shall have the right to prepare the area for occupancy with his own forces and deduct the costs from the Contract Amount. (If Contractor does not respond within 4 hours' notice).
3. If the Contractor fails to staff the job adequately to meet the completion date, the Owner reserves the right to assume possession of the material and complete installation with the Owner's forces or other Contractors or to require the Contractor to work evenings and weekends at no additional cost.
4. The jobsite may be made available on weekends and evenings to allow the Contractor additional time to complete the work before final completion date. Any custodial or Construction Manager costs resulting in this after-hours scheduling will be the Contractor's responsibility as their contractual hourly rate.
5. Work in each work period shall progress at least at a pace in proportion to the Contract time available.
6. The Contractor is responsible for temporary protection of all work until acceptance.
7. All existing conditions must be verified in the field. The Owner takes no responsibility for actual conditions found deviating from the drawings. If existing condition interferes with contract work, contractor is responsible to eliminate this condition.

8. Contractor must plan, provide and maintain his own access, ramping, and egress as required into and out of the site, staging of trailer(s), materials, machinery, and equipment in agreement with the Construction Manager's Superintendent. Maintain free and safe access on the jobsite for other related project personnel. Maintain safe pedestrian or vehicular traffic must be regulated by a flagman. Trucking and delivery operation should be coordinated with Construction Manager's Superintendent and all other trades.

9. Contractor is responsible for all work shown on Contract Documents, including drawings of other trade disciplines. For example, the HVAC Contractor will be responsible for HVAC work shown on Architectural Drawings.

10. Contractor is responsible to maintain existing site fencing in its existing condition. Modifications to the fence to better accommodate the contract work can be discussed with the Construction Manager. These changes shall then be handled by this contractor at his expense and in accordance with the Construction Manager's Superintendent's direction. Any cost incurred as a result of damages shall be charged to this contractor.

11. Contractor's personnel will not be permitted to use the Bedford Central School District's facilities (including toilet, telephone, food services, etc.) for their own benefit. Contractors' Superintendent must explain this to all their field forces.

12. Time is of the essence. Contractors' proposed schedule must be approved by the Construction Manager. Contractor shall indicate significant events such as submittals, shop drawings, material ordering, fabrication, delivery, coordination precedents, installation, testing and turnover by area or system as agreed with Construction Manager. A revised progress status shall be required on a weekly basis.

13. Decisions required from the Construction Manager, Architect and/or Engineer, shall be anticipated by the Contractor to provide ample time for inspection, investigation or detailed drawings.

14. Contractor shall limit his operations including storage of materials and prefabrication to areas within the Contract Limit Lines unless otherwise permitted by the Construction Manager at the Owner's option.

15. Contractor shall coordinate the use of premises with the Owner and Construction Manager and shall move at his own expense any stored products under Contractor's control, including excavated material, which interfere with operations of the Owner or separate contractors.

16. Contractor shall obtain and pay for the use of additional storage of work areas needed for operations.

17. Contractor shall assume full responsibility for the protection and safekeeping of products under this Contract stored on the site and shall cooperate with the Construction Manager to ensure security for the Owner's Property.

18. The intention of the work is to follow a logical sequence; however, the Contractor may be required by Construction Manager to temporarily omit or leave out any section of his work, or perform his work out of sequence. All such out of sequence work and come back time to these areas shall be performed at no additional cost.

19. Contractor shall submit a three-week schedule (man-loaded by work activity and area) to Construction Manager each week. Contractor's representative shall attend a weekly meeting with all contractors, chaired by Construction Manager, for the purpose of job coordination and sequencing. Contractor is responsible to coordinate the job with other trades and Construction Manager, and to cooperate with other trades in pursuit of the overall project's shop drawings and actively participate in resolving discrepancies, conflicts, interferences, etc.

20. Each Prime Contractor shall prepare an overall job schedule for his portion of work upon award of Contract, as per section 013216 - Construction Progress Schedule.

21. Sufficient manpower shall be provided at all times to maintain progress of the job. A shortage of labor in the industry shall not be accepted as an excuse for not properly manning the job.

22. The contractor shall take special care in verifying that his equipment matches the characteristics of the power being supplied.

23. Any contractor personnel including project managers, supervisors, etc. who engage in any personal attacks, belligerent or threatening speech/texts, etc., to the owner, or any of its agents, will be removed from working on the project.

24. Insubordination, unsafe practices, horseplay, abusive behavior or language, wanton destruction of property, use of drugs or alcohol, possession of firearms, and solicitation shall not be tolerated. There will be no warnings, and Contractor shall designate a responsible on-site supervisor to handle any situations that may arise, including termination.

25. Each contractor is responsible to supply and install all wood blocking/bracing necessary to properly secure their work. This responsibility includes coordinating the installation in concealed areas without delaying other trades.

26. Union business shall not be conducted on site. Any Union representatives that visit the site must declare what

Contractor's personnel they represent, and must be escorted by that Contractor's Union steward at all times. No visitors, sales representative or non-working personnel shall be permitted on site without prior consent of the Construction Manager. No photographs shall be taken without the Construction Manager's prior approval.

27. Organize daily clean ups as well as participating in a weekly joint clean up involving all prime contractors onsite. Clean up shall be considered a safety issue. If any contractor fails to keep the site safe and brook clean within 4 hours of being notified by the Construction Manager, either verbally or in writing, the Construction Manager will have the cleanup work performed by others and will back charge accordingly.

28. Contractor shall provide protection from damage to adjacent and adjoining work and/or structures. Contractor shall clean, repair and/or replace any damage for which this contractor is responsible.

29. Contractor shall submit hourly rate sheets that would apply to time and material work for all pertinent trades upon Award of Contract.

30. Contractor shall examine surfaces and conditions prior to start of work. Report unacceptable conditions to the Construction Manager. Do not proceed until unacceptable conditions are corrected and acceptable. Starting of work implies acceptance.

31. Upon removal of exterior walls and window units, the building security and weather protection is the responsibility of the prime contractor performing the removals.

32. Each Prime Contractor shall include general housekeeping of light debris. All debris from each Prime Contractor will be collected daily and disposed of into their dumpsters. **In addition to daily general housekeeping, the General Work Contractor (Contract #1) shall provide a weekly broom sweep and damp mop of all areas for the entire duration of the project**. The broom sweep shall include debris from all trades working on site.

33. It is the responsibilities of all Prime Contractors to review the entire summary of work and remaining documents for additional work items.

34. SLEEVES AND SLEEVE LAYOUT - It is the responsibility of the Prime Contractor requiring a sleeve to provide the sleeve and a layout sketch to the Prime Contractor performing the construction activity that the sleeve goes in.

35. Each contractor is responsible to review and become familiar with the scope of work included in all Contracts.

36. Limited site space is available in areas as designated by the Construction Manager. Construction trade parking is not permitted in Owner's employee parking lot.

37. Each contractor shall provide the engineering layout required to properly complete his work from an established working point. Contractor shall employ only competent engineering personnel skilled in performing layout tasks of similar complexity.

38. Prior to commencing the work, each Contractor shall provide written acceptance of grades, structures, substrates, and/or systems installed by other Contractors as suitable for installation of his work. Failure to provide this verification prior to commencing work shall constitute acceptance of the existing conditions.

39. Each Contractor shall coordinate with the Construction Manager for lay down areas, staging areas, and overall use of project site.

40. All contractors and their employees, subcontractors and supplier are expressly prohibited from entering the occupied areas of the school buildings during school hours without prior written permission of the Construction Manager and for using any of its facilities (i.e. restrooms, cafeteria, etc.).

41. Each contractor is responsible for the timely provision of the information required by other Contractors for the progress of other Contractors' work.

42. All contractor foremen must have working cell phone and number provided to CM.

43. No recycled import fill materials are permitted.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 011000

SECTION 01 11 00

MILESTONE SCHEDULE

Part 1 - GENERAL

1.1 Milestone

The following milestone schedule serves as a basis for bidding. A Master Schedule will be developed at a general meeting with the successful bidders within 21 days of Letter of Intent to Award the Contracts. Contractors will coordinate activities, forward submittals, deliver materials and provide necessary manpower to meet the milestones listed below.

1.2 Milestone Schedule

Bedford Central School District Phase 1A Project	**Start**	**Finish**
• FLHS 1A Building Work (exterior masonry, chemical storage room ventilation, security Vestibule)	26-Jun-23	25-Aug-23
• FLHS 1A – Exterior Doors Replacements (During School vacation weeks December, February and March)	22-Dec-23	29-Mar-24
• Electrical work on High School baseball field and Middle School parking lot site lighting	24-JUL-23	01-Sept 23
• Electrical work Field # 4 and upper parking lot	10-Jun-24	23-Aug-24
• FLMS 1A Building Work (outdoor shelter)	26-Jun-23	25-Aug-23
• FLMS 1A - Doors & Hardware Replacement (2nd shift work during school year +/- 3:00pm – 11:00pm)	2-Oct-23	22-Nov-23
• Mount Kisco 1A Building Work	26-Jun-23	30-Aug-23
• Bedford Village 1A Building Work	26-Jun-23	25-Aug-23
• Bedford Hills 1A Building Work	26-Jun-23	30-Aug-23
• Pound Ridge 1A Building Work	26-Jun-23	25-Aug-23
• West Patent 1A Building Work	26-Jun-23	25-Aug-23

No work will be allowed during times of school testing and/or regents. Actual dates have not yet been established, but the contractor should figure 4 working days.

Contractors are specifically notified that they must properly man the project. A continued job presence is required with a competent field superintendent and a sufficient supply of tradesmen to maintain progress and flow of work as required by schedule and to coordinate/install timely for other trades.

After school starts in September, any open work items will be completed on 2nd shift +/- 3:00 pm – 11:00 pm. Second shift work will be performed at no additional cost to the owner. Contractors will include any/all additional costs in their base bid.

Any additional work/coverage costs required by the Owner's representatives including Construction manager, Architect and consultants due to schedule overage beyond milestone dates, if determined to be caused by contractor, will result in a deduct change order at the owners/representative's contractual rate.

All work required by any of the Owner's representatives and consultants, including the Construction Manager, Architect, Architect's consultants, Owner's Attorneys, etc., to execute final close-out of contract after 30 days beyond Milestone dates if determined to be caused by contractor, shall result in payment(s) to the Owner's representatives and consultants, including the Construction Manager, Architect, Architect's consultants, Owner's Attorneys, etc., in the form of a change order deduct to the base contract.

PRODUCTS (Not

Applicable) EXECUTION

(Not Applicable)

END OF SECTION

SECTION 01 21 00 ALLOWANCES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements governing allowances. Selected materials and equipment are specified in the Contract Documents by allowances. In some cases, these allowances include installation. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following: Contingency allowances and Quantity Allowances

C. Related Sections: The following Sections contain requirements that relate to this Section: Division 1 Section " Contract Modification Procedures" specifies procedures for submitting and handling Change Orders.
Division 1 Section "Quality Requirements" specifies procedures governing the use of allowances for inspection and testing.

1.3 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise the Architect and Construction Manager of the date when the final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At the Architect's and Construction Managers request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by the Architect from the designated supplier

1.4 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

B. Submit invoices or delivery slips to show the actual quantities of materials delivered to the site for use in fulfillment of each allowance.

1.5 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed for the Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

B. The Contractor's overhead and profit, including costs for bonds and insurance, delivery, Supervision,equipment rental and similar costs, for these allowances shall be included in the values of the general requirements of contract sum and are not chargeable under allowance disbursement.

C. At Project closeout, credit unused amounts remaining in the contingency allowance to the Owner by Change Order.

1.6 UNUSED MATERIALS

A. Return unused materials to the manufacturer or supplier for credit to the Owner, after installation has been completed and accepted.
When requested by the Architect, prepare unused material for storage by Owner where it is not economically practical to return the material for credit. When directed by the Architect, deliver unused material to the Owner's storage space. Otherwise, disposal of unused material is the Contractor's responsibility.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly upon delivery for damage or defects.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. CONTRACT 1- General Construction Contractor:

Allowance GC-1: Contractor shall include a contingency allowance of **$ 20,000** for use according to the Owner's Instructions.

Allowance GC -2 Floor Self Leveling : Contractor shall include in their base bid an additional allowance of **1000 SF** of self – leveling floor material at ½" depth to be used as an add or deduct from base bid quantity.

Allowance GC -3 Floor Self Leveling : Contractor shall include in their base bid an additional allowance of **250 SF** of self – leveling floor material at 1.5" depth to be used as an add or deduct from base bid quantity.

B. CONTRACT 2- Mechanical Work Contractor:

Allowance MC-1: Contractor shall include a contingency allowance of **$ 5,000** for use according to the Owner's Instructions.

C. CONTRACT 3- Electrical Work Contractor:

Allowance EC-1: Contractor shall include a contingency allowance of **$ 20,000** for use according to the Owner's Instructions.

END OF SECTION

SECTION 01 22 00 UNIT PRICES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

This Section includes administrative and procedural requirements for unit prices.

B. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division 1 Section "Modification Procedures" for procedures for submitting and handling Change Orders.
2. Division 1 Section "Quality Control Services" for general inspection requirements.

1.3 DEFINITIONS

A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if the estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, overhead, profit, bond, applicable taxes, etc. The unit prices are utilized as an add or deduct from the contractors base bid and/or allowance.

B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. The Owner reserves the right to reject the Contractor's measurement of work-in-place that involves use of established unit prices, and to have this work measured, at the Owner's expense, by an independent surveyor acceptable to the Contractor.

D. Schedule: A "Unit Price Schedule" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials described under each unit price.

E. PART 2 - EXECUTION

2.1 UNIT PRICE SCHEDULE

A. General Work Contractor

1. **Unit Price GC No. 1**: Floor Self Leveling ½″ depth
2. Description (Unit price cost): Material & Labor for preparation of substrate and ½″ of floor self leveling as per Section 03650. To be used as an add or deduct from base bid quantities and/or allocation of bid allowance.
3. Verification of quantity by CM.
4. Unit of Measurement: per SF in in place

1. **Unit Price GC No. 2**: Floor Self Leveling 1.5″ depth
2. Description (Unit price cost): Material & Labor for preparation of substrate and 1.5″ of floor self leveling as per Section 03650. To be used as an add or deduct from base bid quantities and/or allocation of bid allowance.
3. Verification of quantity by CM.
4. Unit of Measurement: per SF in in place

B. Mechanical Construction Contractor

None

C. Electrical Construction Contractor

None

END OF SECTION

SECTION 01 23 00 ALTERNATES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added or deducted to Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

I. The cost for each alternate is the net addition to the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

I. Include as part of each Alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - GENERAL (not applicable)
PART 3 – EXECUTION

3.1 SCHEDULE OF ALTERNATES

ALTERNATES FOR BASE BID GC-1

1. **ALTERNATE NO. 1 TO GC-1**

The General Contractor shall state the complete price to be (added to) the base bid to provide general construction for High School door and frame replacements at doors 'A2', 'B1", & 'F5' as shown on the contract documents.

2. **ALTERNATE NO. 2 TO GC-1**

The General Contractor shall state the complete price to be (added to) the base bid to provide demolition and new doors/frames for Middle School doors 'G1-A' & 'G1-B' as shown on the contract documents.

3. **ALTERNATE NO. 3 TO GC-1**

The General Contractor shall state the complete price to be (added to) the base bid to provide new walls and windows as shown at Middle School Shelter Room as shown on the contract documents.

4. **ALTERNATE NO. 4 TO GC-1**

The General Contractor shall state the complete price to be (added to) the base bid to provide front entry door replacement at Bedford Hills Elementary School as shown on the contract documents.

ALTERNATES FOR BASE BID MC-2

1. ALTERNATE NO. 1 TO MC-2

The Mechanical Contractor shall state the complete price to be **(added to)** the base bid to provide mechanical construction for Mount Kisco Elementary School Room 64A split system as shown on the contract documents.

ALTERNATES FOR BASE BID EC-3

1. ALTERNATE NO. 1 TO EC-3

The Electrical Contractor shall state the complete price to be **(added to)** the base bid to provide electrical construction for Mount Kisco Elementary School Room 64A split system as shown on the contract documents.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01 23 01 – CONSTRUCTION PHASE CLARIFICATIONS – REQUESTS FOR INFORMATION FROM ARCHITECT'S OFFICE

PART 1 - GENERAL

1.01 SUBMISSION OF ARCHITECT'S RFI FORM:

A. In addition to the requirements of General Conditions, Articles 1.1.10, 1.1.11, 1.26, 3.12, 4.2, 4.3, 4.4, 7.1, 7.2, 7.3, 7.4, 7.5 and 13.4 (and all other Articles as deemed applicable by the Architect), each Prime Contractor shall comply with the following wherever it applies to the work of his contract:

1. Each Prime Contractor shall prepare and submit, on the Architect's attached form (see last page of this specification section), an original Request For Information (RFI) to Architect's Office, for all questions which may arise during post-bid award activities which are to be directed to the office of the Architect. This form shall be submitted before commencement of any work, which may be in question. (Commencement of work in question shall constitute complete acceptance of field conditions and necessary remedial repairs as directed by the Architect, and work shall be conducted at no additional charges to the Owner.) The RFI form shall indicate, at the bare minimum, the following information:

   a. Date of Request and RFI number.

   b. Project Name and Project Number: reflecting title sheet information, including SED number.

   c. Attention of: Name of Architect in Charge/Project Director/Project Manager.

   d. From: Name of submitting Prime Contractor representative, including his project title, office or field office phone number, and fax number.

   e. Trade: The Prime Contract, which is being represented.

   f. Date Information Required By: Fill in exact date information is required. "*ASAP*" or "*IMMEDIATELY*" will not be acknowledged by the Architect's office.

   g. Detailed description of requested item.

2. Note to all Prime Contractors: *Request For Information* forms shall be used for requests, clarifications, or questions on contract drawings and specifications, ***not*** contract terms, scheduling items, or general correspondence, or as a means to describe or request approval of alternate construction means and methods, concepts, substitutions, materials, or systems. *Each individual Prime Contractor is to fill out the Architect's RFI form completely (leaving no blanks) and send them DIRECTLY*

via fax to the Architect's Office, with a concurrent copy to the Construction Manager's office. Neither the Architect nor the Construction Manager will be filling out these forms on your behalf, but they will be working with each other and the Owner to answer such RFIs. Incomplete RFI forms will not be logged in, and will be discarded. *It shall not be the Architect's responsibility to contact any Prime Contractor submitting RFIs to verify their completeness or accuracy.*

B. RFI Log: Each Prime Contractor shall be responsible to generate an RFI log, to be updated and submitted weekly to the Architect and the Construction Manager. Examples of acceptable log format can be obtained from the office of the Construction Manager. Log shall include, at bare minimum, the following items:

a. Date of submittal to Architect's office, and method of transmittal.

b. Date of response from Architect's office.

c. If not yet responded to, number of days since submittal.

d. In Prime Contractor's opinion, list of affected trades impacted by the results.

1.02 LIMITATIONS:

A. Requests for information shall be made in full accordance with A.I.A. Standard Document B141-1997 (Standard Form of Agreement Between Owner and Architect), Article 2.6, Contract Administration Services, Items 2.6.1.5, 2.6.1.6, and 2.6.1.7. The Architect agrees to the following actions with regard to "Requests For Information" which are received by his office:

1. The Architect shall review properly prepared, timely requests by the Contractor for additional information about the contract documents. A properly prepared Request for Additional Information about the Contract Documents shall be in a form prepared or approved by the Architect, and shall include a detailed written statement that indicates the specific drawings or specifications in need of clarification and the nature of the clarification requested (A.I.A. B-141-2.6.1.5).

2. If deemed appropriate by the Architect, the Architect shall, on the Owner's behalf, prepare, reproduce, and distribute supplemental drawings and specifications in response to Request For Information by the Contractor (A.I.A. B-141-2.6.1.6).

3. The Architect shall interpret and decide matters concerning performance of the Owner and Contractor under, and requirements of, the contract documents on written request of either the Owner or Contractor. The Architect's response to such requests shall be made in writing within any time limits agreed upon or otherwise with reasonable promptness (A.I.A. B-141-2.6.1.7).

4. Based upon the amount of RFIs received, and their content, unless otherwise so indicated on the RFI, the Architect shall establish the level of importance of said RFIs, and shall be allowed sufficient time in the Architect's professional judgement to permit adequate review. Prior to submitting any RFIs, each Prime Contractor shall use their individual discretion in determining whether or not an RFI format or verbal format be used to resolve said situation.

5. In the event of multiple sequential RFIs received same day at the Architect's office, *unless they are specifically numbered by the Prime Contractor for their order of relative importance*, they will be reviewed either: a) in the time order in which they were received by the Architect's office, b) in their natural progressive order of construction placement, or c) in order of preference, as determined by the Architect.

6. As a result of multiple sequential RFI submission, no delays in time, or Prime Contractor hard or soft costs shall be implied or imposed onto the Architect. It is the Prime Contractor's complete responsibility to adhere to the prepared Construction Schedule at all costs, including extended delays, which may be incurred by time required for RFI responses from the Architect's office.

7. Should an answer be required 'immediately', the Prime Contractor shall simply place an asterisk by the date required to call attention to such a fact. He shall coordinate his own work forces accordingly to allow the Architect proper review and analysis time for resolution of such 'immediate' problems.

8. *It shall be the Prime Contractor's complete responsibility* to document any verbal responses, into either follow-up RFI submittals or formal letters (on company logo stationery) to the Architect's office. Upon receipt, the Architect will review and make modifications to the correspondence if it varies in content from the Architect's interpretation. This will eliminate confusion or misunderstandings made in verbal form.

9. The Architect shall be the sole interpreter of all RFI validity, as the RFI is based on products of service produced by the Architect's office. The Architect reserves the right to reject any and all RFIs deemed frivolous or trivial.

10. As work in question is directed to the Architect for his sole response, only the attached Architect's RFI form will be considered as final and binding.

1.03 LOG-IN PROCEDURE FOR ALL RFI REQUESTS

A. Log-in procedures are based on the normal business hours of the Architect's office, and ***will not be modified for any reason***. The Architect's normal business hours are 8:00 a.m. to 5:00 p.m., EST, Monday through Friday. ***All RFIs shall be reviewed by the Architect's office during normal business hours.*** The Architect's office is closed on the following legal holidays: New Year's Day, President's Day, Memorial Day, Labor Day, Thanksgiving Day and the day following, and Christmas Day. ***Under no circumstances shall the Architect's office be considered or assumed as open for business on Saturdays, Sundays, or legal holidays.***

B. Any RFIs, which are received between 8:00 a.m. and 2:59:59 p.m. on a normal business day, will be received and logged in as received on that business day. Any RFIs, which are received and logged in by the Architect's Office at 3:00 p.m. or later (Eastern Standard Time) on a normal business day shall be considered as received at 8:00 a.m. the following business day. Any RFIs received by the Architect's office at or after 3:00 p.m. on Fridays will be logged in as received at 8:00 a.m. on the next following business day (Monday), In the case of the following calendar day being a holiday, the RFI shall be considered as received on the next non-holiday business day at 8:00 a.m. ***All receipt times shall be as determined by the received time stamped and signed in by the Architect's office.***

1.04 PROPER SEQUENCING OF RFI SUBMISSIONS

A. It is the Prime Contractor's sole responsibility to fully coordinate submission of RFI forms with shop drawing and technical data submittals made or yet to be made. The Prime Contractor must coordinate each RFI with requirements of work and the contract documents.

B. The Prime Contractor's responsibility for deviations in submissions from requirements of contract documents is not relieved by Architect/Engineer's review of RFIs or associated submissions, unless the Architect gives written acceptance of specific deviations.

C. The Prime Contractor's responsibility for errors and omissions in submissions or RFIs is not relieved by the Architect's review of submissions or RFIs.

D. In conformance with Section 01300 - Submissions, notify the Architect in writing *at time of shop drawing/technical data submission* of deviations in submissions from requirements of contract documents. Do not wait until RFI is prepared to inform the Architect's office of planned deviations.

E. Similar to Section 01300 - Submissions, no portion of the work requiring RFI clarifications shall be started, fabricated, or installed until return of Architect's formal response, including any supplemental information the Architect deems relevant for clarification.

F. After response to RFI, the affected Prime Contractor shall distribute copies of the RFI responses to all parties requiring

same for coordinating all subsequent work. The Architect's only responsibility shall be to supply one copy of each RFI resolution to: the Construction Manager, the Owner, and the affected Prime Contractor who initiated the RFI.

G. The affected Prime Contractor shall make required copies of all RFI resolutions for distribution to all affected parties immediately upon receipt and review of same.

H. 1.05 AFFECT OF RFI RESPONSES ON THE PRIME CONTRACTOR'S CONSTRUCTION SCHEDULE

A. All Prime Contractors shall note well that the Architect is not legally bound to their approved construction schedules; the Prime Contractors are the only parties legally bound therein. The Architect is not required to expedite any reviews or comments in the effort to expedite the Prime Contractors' submission and/or construction schedules. Therefore, time delays created by the Architect's required review time of each RFI shall be absorbed into the Prime Contractor's work schedule accordingly. This may necessitate such Prime Contractor measures as: multiple work crews, off-hour or weekend construction by the affected Prime Contractor(s), to be completed at no additional costs to the Owner. For this reason, it is imperative that each Prime Contractor carefully review all documents as early as possible, in order to issue RFIs by the earliest possible date.

B. Any RFIs which are relative to an alteration, to the approved contractual details, or specifications will be specifically referred to the Architect's office with relative time differences noted. Any additional time required for alterations, if RFIs are approved, shall have all additional costs (if any) absorbed directly by the Prime Contractor affected. ***Should other Prime Contractors be directly affected in either labor, material, or equipment costs, their additional costs shall be borne by the Prime Contractor who initiated the RFI.***

1.06 AFFECT OF RFI FORMS ON CONTRACTOR PREPARATION, AND PREPARATION OF SHOP DRAWINGS, SAMPLES, MANUFACTURER'S DATA, ETC.

A. It is the responsibility of the Contractor furnishing and/or installing materials and/or systems to these projects to field verify all existing and/or as-built conditions, as well as all conditions presently under construction that are interrelated in whole or in part to the furnishing and/or installing of such materials and/or systems. Submissions of RFI forms are at the sole discretion of each Prime Contractor.

B. It is the responsibility of each Prime Contractor to coordinate such field verification and be ultimately responsible for the accuracy of same prior to the submission of any RFI forms or shop drawings for design intent review by the Architect/Engineer.

C. Similar to submittal information indicated in Section 01300 - Submissions, all RFIs initiated by any subcontractor and/or supplier

of the Prime Contractor and/or supplier of the Prime Contractor or by the Prime Contractor themselves shall be reviewed by and shall be deemed officially submitted by the Prime Contractor. All RFIs shall be thoroughly checked by the Prime Contractor prior to the submission of same to the Architect's office for: contract document accuracy, validity and/or equivalency (if applicable); total quantity of material provided; all dimensioning systems related; alteration to same if necessary to accommodate accepted field changes built or pending; interaction with other materials and/or systems furnished and/or installed by this Prime Contractor or their subcontractors (i.e., field measurements for space allocation, accuracy to previous submittals of this Prime Contractor, etc.); and interaction with materials and/or systems provided by other Prime Contractors.

D. After the completion of applicable RFIs, when submitting subsequent revised technical data or revised shop drawings, the Prime Contractor shall signify same on subsequent submittal by having the following information on each and every submittal:

- Name of Prime Contractor
- Date of Review by Prime Contractor
- Note: This submittal has been reviewed by (Name of Prime Contractor) in accordance with the contract documents describing and defining the requirements of such review, with affected RFI number attached.
- Copy of approved RFI, indicating Architect's final comments.
- Signature of Prime Contractor's reviewer.
- Name of Prime Contractor's reviewer (printed).
- Title of Prime Contractor's reviewer (printed).

E. The Prime Contractor shall submit in writing to the Architect and Construction Manager, prior to their relevant revised or initial submissions, the name and title of the reviewer who shall be an employee of the Prime Contractor for review and acknowledgment of same, along with the recommended RFI from the Architect's office.

F. As this project has a Construction Manager who is acting on the Owner's behalf and who has full-time construction site representation, the scheduling of all RFIs, submissions, the coordination, and interaction of other prime contractors, field conditions that affect the submission of, fabrication of, or installation of another Prime Contractor's submission, fabrication, or installation shall be made known to the Owner's Representative. Refer to Section 01300 - Submissions for additional relevant information.

G. Any resultant construction field condition that arises that is contrary to an RFI or submission made, that is conflicting with another Prime Contractor's submission, the schedule for construction, or with another Prime Contractor's constructed work shall be immediately identified by the Prime Contractor(s) and made known to the Owner's Representative. If such condition causes any construction schedule delay, "rereview" by the Architect/Engineer, additional work of the Architect/Engineer (such as field review, "redesign" or document preparation); or "reconstruction" of any work already built and/or accomplished by another Prime Contractor, the

connection to such conditions (and any associated costs to accomplish same) shall be the sole responsibility of the Prime Contractor found negligent in causing such conditions.

H. Any RFI not containing complete information outlined and required as indicated within the above subsections will not be reviewed by the Architect for design intent, but rather rejected and discarded, so all Prime Contractors must insure that no blanks are left on their submitted RFIs. All time lost as a result of this error will be the sole responsibility of the Prime Contractor who made the error.

I. Any RFI submitted by the Prime Contractor that requires subsequent coordination with another material and/or system provided by this Prime Contractor or another Prime Contractor that has been reviewed, by that Prime Contractor and previously submitted to the Architect may be rejected in whole or part by the Architect, or held in abeyance by same until the corresponding and coordinating submittals are submitted as the concurrent review of all such submittals for design intent, may be deemed important by the Architect. Any release given any entity other than the Architect to fabricate, furnish, and install any material or system not reviewed by the Architect for design intent shall become the sole responsibility of the releasing entity as well as the resolution of construction related issues or conflicts, relative to approved or disapproved RFIs.

J. In addition, the Prime Contractor shall not utilize nor refer to any schedule of work not created nor provided by the Architect. The Prime Contractor's method in establishing, defining, and/or substantiating their ability to maintain the schedule presented in these contract documents and as prepared by the Owner's representative shall be exclusive of a defined time period of submittal review, and shall not be dependent upon RFI approval or time delays incurred.

K. Similar to Item 1.03L of Section 01300 - Submissions, the rejection or abeyance noted in the above subparagraph shall not be considered a delay or a reason for an extension of time in the construction schedule to the contract, as such cause for same shall have been brought upon by the Prime Contractor not providing the "pre-coordination" necessary for such submissions.

PART TWO – PRODUCTS

Not Applicable.

PART THREE – EXECUTION

Not Applicable.

END OF SECTION

BBS Architects, Landscape Architects, & Engineer, P.C.
244 East Main Street
Patchogue, New York 11772

Phone: (631) 475-0349
Fax: (631) 475-0361

REQUEST FOR INFORMATION

RFI NO:____
DATE: / /

PROJECT: **PROJ. NO:**

LOCATION:

TO THE ATTENTION OF:

FROM:

PHONE: **FAX:**

TRADE:

DATE INFORMATION REQUIRED BY:

REQUEST:

Spec Section: Description:

REPLY:

BY: **FIRM:** **DATE:**

If a "Request for Information" is deemed relevant and appropriate by the Architect, the Architect's response to such requests shall be made in writing within any time limits agreed upon or otherwise with reasonable promptness. Upon evaluation of the Prime Contractor's request and if deemed necessary, the Architect's response may include supplemental drawings and specifications.

SECTION 01 26 00 - CONTRACT MODIFICATION

PROCEDURES PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing contract modifications.
   1. Provisions of this Section apply to the work of each prime contractor.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 1 Section "Submittals" for requirements for the Contractor's Construction Schedule.
   2. Division 1 Section "Applications for Payment" for administrative procedures governing Applications for Payment.
   3. Division 1 Section "Substitutions" for administrative procedures for handling requests for substitutions made after award of the Contract.

1.3 MINOR CHANGES IN THE WORK

A. The Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or Contract Time, on AIA Form G710, Architect's Supplemental Instructions.

1.4 CHANGE ORDER PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: The Architect will issue a detailed description of proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
   1. Proposal requests issued by the Architect are for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.
   2. Within 7 days of receipt of a proposal request, submit an estimate of cost necessary to execute the change to the Architect for the Owner's review.
      a. Include an itemized list of quantities of products

required and unit costs, with the total amount of purchases to be made. Furnish survey data and backup invoices, quotes paperwork to substantiate.

b. Separate labor hours by trade and indicate labor rate. (Submit attached labor rate worksheet notarized for each trade / classification.)

c. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

d. Include an updated Contractors Construction Schedule that indicates the effect of the change, including but not limited to; changes in activity duration, start and finish times, and activity relationship. Use available float before requesting an extension of contract time.

B. Contractor-Initiated Proposals: When latent or unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.

1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
2. Include an itemized list of quantities of products required and unit costs, with the total amount of purchases to be made. Furnish survey data to substantiate quantities. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts. Include labor rate breakdown sheets for each trade.
3. Comply with requirements in Section "Product Substitutions" if the proposed change requires substitution of one product or system for a product or system specified.
4. Include an updated Contractors Construction Schedule that indicates the effect of the change, including but not limited to; changes in activity duration, start and finish times, and activity relationship. Use available float before requesting an extension of contract time.

C. Proposal Request Form: Use AIA Document G709 for Change Order Proposal Requests.

1.5 ALLOWANCES

A. Allowance Adjustment: For allowance-cost adjustment, base each Change Order Proposal on the difference between the actual purchase amount and the allowance, multiplied by the final measurement of work-in-place. Where applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. Include installation costs in the purchase amount only

where indicated as part of the allowance.

2. When requested, prepare explanations and documentation to substantiate the margins claimed.
3. Submit substantiation of a change in scope of work claimed in the Change Orders related to unit-cost allowances.
   Separate labor hours by trade and indicate labor rate. (Submit attached labor rate worksheet notarized for each trade / classification.)
4. The Owner reserves the right to establish the actual quantity of work-in-place by independent quantity survey, measure, or count.
5. **Contractor's overhead and profit, including costs for bonds & insurances, for these allowances shall be included in the values of the general requirements of contract sum and are not chargeable under allowance disbursement**.

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or the Contractor's handling, labor, installation, overhead, and profit. Submit claims within 15 days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. The Owner will reject claims submitted later than 15 days.
   1. Do not include the Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in Contract Documents.
   2. No change to the Contractor's indirect expense is permitted for selection of higher or lower-priced materials or systems of the same scope and nature as originally indicated.

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: When the Owner and the Contractor disagree on the terms of a Proposal Request, the Architect may issue a Construction Change Directive on AIA Form G714/CMa. The Construction Change Directive instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
   1. The Construction Change Directive contains a complete description of the change in the Work. It also designates the method to be followed to determine change in the Contract Sum or Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
   1. After completion of the change, submit an itemized account

and supporting data necessary to substantiate cost and time adjustments to the Contract.

I.7 CHANGE ORDER PROCEDURES

A. Upon the Owner's approval of a Proposal Request, the Architect or Construction Manager will issue a Change Order for signatures of the Owner, Architect, Construction Manager and the Contractor on AIA Form G701.

B. Contractor cannot requisition for any allowance or change order work until the paperwork has been fully executed by the Contractor, CM, Architect and Owner.

C. Requests for changes in bond fees, if any, will be analyzed at the conclusion of the project. Contractors bonding company to submit substantiation letter. (Bond amount based on total adjusted contract value)

PART 2 - PRODUCTS (Not

Applicable) PART 3 - EXECUTION

(Not Applicable)

END OF SECTION

Arris Contracting Company, Inc.
189 Smith Street
Poughkeepsie, NY 12601

LABOR RATE WORKSHEET

Project No. _____

Contractor Name: _____ County: _____ Date: _____
Address: _____
_____
Telephone Number: _____

Trade: _____
(Provide separate sheet for each trade, foreman/journeyman, etc.)

	*	% per hour	$ per hour	REGULAR BASE RATE	PREMIUM TIME BASE RATE
A. WAGE RATE PER HOUR					
BENEFITS (* Identifies benefits paid directly to the Employee.)					
Vacation and Holiday					
Health and Welfare					
Pension					
Annuity					
Education / Apprentice Training					
Supplemental Unemployment					
Security Fund					
Industry Advancement					
UBC-Appr., Health, Safety, Educ.					
Labor Management Fund					
B. TOTAL BENEFITS PER HOUR					

PAYROLL TAXES AND INSURANCE	
F.I.C.A. / Social Security (up to the maximum required by law)	%
Medicare	%
Federal Unemployment (up to a maximum of $56.00 per employee per year)	%
State Unemployment (up to 1st $8,500 of base salary paid per employee per year)	%
Workers' Compensation Code: _____	%
Disability	%

C. TOTAL TAXES AND INSURANCE PER HOUR

All Benefits are paid directly to Employee. _____ x _____ % =
Only benefits identified by * are paid directly to Employee.

D. TOTAL LABOR RATE (A + B + C) =

E. DOCUMENTATION

For General Liability and Workers Compensation, provide policy renewal page from insurance carrier (with contractor name, address, and insurance agent) for substatiation purposes.

F. CONTRACTOR'S CERTIFICATION

I certify that the labor rates, insurance enumerations, labor fringe enumerations and expenses are correct and in accordance with actual and true cost incurred.

_____
Signature

_____
Print Name of Authorized Representative

_____
Print Title

Sworn before me this _____ day
of _____, 20 _____.

_____
Notary Public

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

a. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

a. This Section specifies administrative and procedural requirements governing each prime contractor's Applications for Payment.
   1. Coordinate the Schedule of Values and Applications for Payment with the Contractor's Construction Schedule, Submittal Schedule, and List of Subcontracts.
b. Related Sections: The following Sections contain requirements that relate to this Section.
   1. Schedules: The Contractor's Construction Schedule and Submittal Schedule are specified in Division 1 Section "Submittals."

1.3 SCHEDULE OF VALUES

a. Coordination: Contractor shall coordinate preparation of its Schedule of Values for the Work with preparation of the Contractors' Construction Schedule.
   1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
      a. Contractor's Construction Schedule
      b. Application for Payment forms, including Continuation Sheets
      c. List of subcontractors
      d. Schedule of allowances
      e. Schedule of alternates
      f. Schedule of submittals
   2. Submit the Schedule of Values to the Construction Manager within 10 days of receipt of Letter of Intent but no later than 10 days before the date scheduled for submittal of the initial Applications for Payment. (SOV's received after the 15th of the month, will not be allowed to requisition until the following month, due to input time for CM & Owner into their computer systems).
b. Format and Content: Use the Project Manual table of contents as a guide to establish the format for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:
   a. Project name and location.
   b. Name of the Architect.
   c. Project SED number.
   d. Contractor's name and address.
   e. Date of submittal.

2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
   a. Related Specification Section or Division.
   b. Description of Work.
   c. Name of subcontractor.
   d. Name of manufacturer or fabricator.
   e. Name of supplier.
   f. Change Orders (numbers) that affect value.
   g. Dollar value.
      1) Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Break principal subcontract amounts down into several line items where requested by Construction Manager. Multiple line items will be provided for amounts in excess of five percent of the contract sum, broken out into sub components equaling not greater than five percent each. Separate all line items by material & labor.
   a. Breakdown shall be separated between additions and sitework with subtotals for each.
   b. Breakdown will be separated by school(and SED number)each with it’s own stand – alone front-end sections as outlined in item 4 below. Each will have their own subtotal, so that the owner can easily see the value to date with needing to add columns.
4. In addition to the breakdown of specification sections, separate line items will be required for the following front-end line items:
   a. Bonds & OCP insurances to have separate line items. (Substantiation letters required from bonding & insurance company for any amounts higher than industry standard). Only OCP insurance allowed for insurance line item. All other insurance costs must be distributed by contractor

evenly throughout the various sections.

b. Supervision - include a minimum of one percent of contract sum.
c. Project Administration - include a minimum of one percent of contract sum.
d. Project meetings (appropriate value for weekly attendance for entire duration of project - see Section 01 31 19 Project Meetings for amount)
e. Punchlist - include a minimum of .5 percent of contract sum
f. Closeout: separate lines for demobilization, Operation & maintenance manuals, closeout paperwork, demonstration & training (total for closeout minimum two percent of contract value)
g. Continuous Clean-up and Final Clean-up values each at minimum of .5%
h. General Contractor to add line item for Broom sweep/damp mopping

5. Round amounts to nearest whole dollar; the total shall equal the Contract Sum.
6. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed.
   a. Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing.
7. Provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Unit-Cost Allowances: Show the line-item value of unit-cost allowances, as a product of the unit cost, multiplied by the measured quantity. Estimate quantities from the best indication in the Contract Documents. Allowances to be listed at the end of the schedule of values.
9. Margins of Cost: Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete. Include the total cost and proportionate share of general overhead and profit margin for each item.
   a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or

distributed as general overhead expense, at the Contractor's option.

10. Schedule Updating: Update and resubmit the Schedule of Values prior to the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

a. Each Application for Payment shall be consistent with previous applications and payments as certified by the Architect and paid for by the Owner.
   1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.
b. Payment-Application Times: Each progress-payment date is indicated in the Agreement. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
c. Payment-Application Times: The date for each progress payment is the 21st day of each month (or as designated by the Owner). The period covered by each Application for Payment is the previous month.
d. Payment-Application Forms: Use AIA Document G732/CMa (include line for Construction Manager signature) and Continuation Sheets G703 as the form for Applications for Payment.
   1. Separate Continuation Sheets shall be provided for work which takes place on each building, which will detail that portion of the contract which is attributable to the specific building.
e. Application Preparation: Complete every entry on the form. Include notarization and execution by a person authorized to sign legal documents on behalf of the Contractor. The Construction Manager will return incomplete applications without action.
   1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Use updated schedules if revisions were made.
   2. Include amounts of Change Orders and Allowances issued prior to the last day of the construction period covered by the application. (No Change Order or Allowance requisitions can be made or listed on the requisition, unless the formal CO/AD paperwork has been fully executed by Contractor, Construction

Manager, Architect and Owner).

3. Provide digital copies of payrolls which are signed and notarized (Blue Ink) documenting compliance with prevailing wage laws. Payroll for contractors is required from the 25th of the previous month to the 24th of the current month. Payroll for subcontractors is required from the 15th of the previous month to the 14th of the current month.
4. Provide copies of lien waivers for the previous payment (or anticipated payment). Include certificate of monthly payment for subcontractors for the previous month.
5. Provide OSHA 10 certificates for all workers on site.
6. Payment for stored materials (whether onsite but not installed, or offsite in a secured warehouse) will require a bill of lading showing the exact value and photographs. In no case shall more than 90% be approved for uninstalled stored materials. An Insurance certificate must be provided, specific to the materials stored with the appropriate dollar value (for onsite or offsite materials).

f. Transmittal: Submit 1 signed and notarized digital copy (blue ink signature) of each Application for Payment to the Construction Manager by a method ensuring receipt within 24 hours. The digital copy shall be complete, and attached as a single file to include all waivers of lien, certified payrolls and similar attachments.
   1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the Architect and Construction Manager.

g. Waivers of Mechanics Lien: With each Application for Payment, submit waivers of mechanics liens from subcontractors, sub-subcontractors and suppliers for the construction period covered by the previous application.
   1. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.
   2. When an application shows completion of an item, submit final or full waivers.
   3. The Owner reserves the right to designate which entities involved in the Work must submit waivers.
      a. Submit final Applications for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
   4. Waivers Forms: Submit waivers of lien on forms, and

executed in a manner, acceptable to the Owner.

h. Initial Application for Payment: Administrative actions and submittals, that must precede or coincide with submittal of the first Application for Payment include the following. The initial payment application will not be processed until all of these actions and submittals have been received by the Construction Manager. When preliminary submissions are received with the initial application (items 4 and 7), the final submission for these items must be received and approved by the Construction Manager prior to submission of the second application for payment.
    1. List of subcontractors.
    2. List of principal suppliers and fabricators.
    3. Schedule of Values.
    4. Contractor's Construction Schedule (preliminary if not final).
    5. Schedule of principal products.
    6. Schedule of unit prices.
    7. Submittal Schedule (preliminary if not final).
    8. List of Contractor's staff assignments.
    9. Copies of building permits.
    10. Copies of authorizations and licenses from governing authorities for performance of the Work.
    11. Initial progress report.
    12. Report of preconstruction meeting.
    13. Certificates of insurance and insurance policies.
    14. Performance and payment bonds.
    15. Data needed to acquire the Owner's insurance.
    16. Initial settlement survey and damage report, if required.
i. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
    1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
    2. Administrative actions and submittals that shall precede or coincide with this application include:
        a. Occupancy permits and similar approvals.
        b. Warranties (guarantees) and maintenance agreements.
        c. Test/adjust/balance records.
        d. Maintenance instructions.
        e. Meter readings.
        f. Startup performance reports.

g. Changeover information related to Owner's occupancy, use, operation, and maintenance.
h. Final cleaning.
i. Application for reduction of retainage and consent of surety.
j. Advice on shifting insurance coverages.
k. Final progress photographs.
l. List of incomplete Work, recognized as exceptions to Architect's Certificate of Substantial Completion.

j. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:
1. Completion of Project closeout requirements.
2. Completion of items specified for completion after Substantial Completion.
3. Ensure that unsettled claims will be settled.
4. Ensure that incomplete Work is not accepted and will be completed without undue delay.
5. Transmittal of required Project construction records to the Owner.
6. Certified property survey.
7. Proof that taxes, fees, and similar obligations were paid.
8. Removal of temporary facilities and services.
9. Removal of surplus materials, rubbish, and similar elements.
10. Change of door locks to

Owner's access. PART 3 - EXECUTION

3.1 No retainage release will be approved by owner until all closeout documents (Closeout paperwork, as-builts, O & M manuals, AIA release forms, warranties, material turnover receipts, etc.) are received and verified complete.

END OF SECTION

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.5 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

2.5 SUMMARY

A. This Section includes administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:
   1. General project coordination procedures.
   2. Conservation.
   3. Coordination Drawings.
   4. Administrative and supervisory personnel.
   5. Cleaning and protection.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 1 Section "Project Meetings" for progress meetings, coordination meetings, and pre-installation conferences.
   2. Division 1 Section " Construction Progress Schedule" for preparing and submitting the Contractor's Construction Schedule.
   3. Division 1 Section "Materials and Equipment" for coordinating general installation.
   4. Division 1 Section "Execution and Closeout Requirements" for coordinating contract closeout.

3.5 COORDINATION

A. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.
   1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
   3. Make provisions to accommodate items scheduled for later installation.
   4. Contractor is required to coordinate with their subcontractors, other Prime contractors and the Construction Manager, sufficiently ahead of the work progressing.

B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of schedules.
2. Installation and removal of temporary facilities.
3. Processing of submittals and photocopying/delivery to affected contractors.
4. Progress meetings.
5. Project closeout activities.

D. Conservation: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work.

4.5 SUBMITTALS

A. Coordination Drawings: Prepare coordination drawings where careful coordination is needed for installation of products and materials fabricated by separate entities. Prepare coordination drawings where limited space availability necessitates maximum utilization of space for efficient installation of different components. (e.g. – subslab piping, ceiling spaces, etc.)
1. Show the relationship of components shown on separate Shop Drawings.
2. Indicate required installation sequences.
3. Comply with requirements contained in Section "Submittals."
4. HVAC Contractor will begin coordination drawing process within 15 calendar days of award of Contract by providing ¼" scale drawings indicating locations of all ductwork layout, piping layout, Bottom of duct etc. Electronic copies will then submitted to Electrical Contractor for lighting fixtures, main feeders and clearances. Finally, to the General Contractor for ceiling information (Each contractor shall complete their review and mark-ups within 5 days)
5. A coordination meeting with all Contractors and subcontractors to review completed coordination drawings will be held within 45 days of Contract award.

B. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:

1. Electronic CAD Files of Project Base Plan Drawings: May only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.
2. Electronic CAD files of Project Drawings: Distributed only under the following conditions:
   a. Use of files is solely at receiver's risk. Architect/Engineer does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify Architect/Engineer of discrepancy and use information in hard-copy Contract Drawings and Specifications.

   CAD Files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.

   b. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
   c. Receiver shall not hold Architect/Engineer responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.
   d. Receiver shall understand that even though Architect/Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
      1) Receiver shall not hold Architect/Engineer responsible for such viruses or their consequences, and shall hold Architect/Engineer harmless against costs, losses, or damage caused by presence of computer virus in files or media.
3. Upon request to the Architect, and at the Architect's sole discretion, Base Plan Drawings only may be provided to the Prime Contractor in electronic format (for example, AutoCAD format) by the Architect at a charge rate to cover the architect's cost for producing.
4. Prior to the Architect's dispensing of documents in electronic format, the Contractor shall execute and deliver an "Electronic Media Release Agreement," provided upon request by Architect, along with said payment.

C. Staff Names: Within 15 days of commencement of construction operations, submit a list of the Contractor's principal staff assignments, including the superintendent and other personnel in attendance at the Project Site. Identify individuals and their duties and

responsibilities. List their addresses and telephone numbers.

1. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

1.5 GENERAL COORDINATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

2.5 CLEANING AND PROTECTION

A. Prime Contractor is to clean and protect construction in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to assure protection from damage or deterioration at Substantial Completion.

B. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to assure operability without damaging effects.

C. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:

1. Excessive static or dynamic loading.
2. Excessive internal or external pressures.
3. Excessively high or low temperatures.
4. Thermal shock.
5. Excessively high or low humidity.
6. Air contamination or pollution.
7. Water or ice.
8. Solvents.
9. Chemicals.
10. Light.
11. Radiation.
12. Puncture.
13. Abrasion.
14. Heavy traffic.

15. Soiling, staining, and corrosion.
16. Bacteria.
17. Rodent and insect infestation.
18. Combustion.
19. High-speed operation.
20. Improper lubrication.
21. Unusual wear or other misuse.
22. Contact between incompatible materials.
23. Destructive testing.
24. Misalignment.
25. Excessive weathering.
26. Unprotected storage.
27. Improper shipping or handling.
28. Theft or vandalism

3.3 REQUESTS FOR INTERPRETATION (RFIs)

A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI and forward to the Construction Manager via the internet web-based service.

B. RFI's shall originate with Contractor. RFI's submitted by entities other than Contractor will be returned with no response.

1. Coordinate and submit RFI's in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

C. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
1. Project Name.
2. Date.
3. Name of Contractor.
4. Name of Architect and Construction Manager.
5. RFI number, numbered sequentially. Use prefix based on Contract (i.e. MC, EC).
6. Specification Section number and title and related paragraphs, as appropriate.
7. Drawing number and detail references, as appropriate.
8. Field dimensions and conditions, as appropriate.
9. Contractor's suggested solution(s). If Contractor solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
10. Contractors Signature.
11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings and other information necessary to fully describe items needing interpretation.
    a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies

and attachments.

D. Architect's Action: Architect will review each RFI, determine action required, and return it.
   1. The following RFIs will be returned without action:
      a. Requests for approval of substitutions.
      b. Requests for coordination information already indicated in the Contract Documents.
      c. Requests for adjustments in the Contract Time or the Contract Sum.
      d. Requests for interpretation of Architect's actions on submittals.
      e. Incomplete RFIs or RFIs with numerous errors.
   2. Architect's action may include a request for additional information.
   3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 1 Section "Contract Modification Procedures."
      a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Construction Manager in writing within 10 days of receipt of the RFI response.

E. On receipt of Architect's and Construction Manager's action, immediately distribute the RFI response to affected parties. Review response and notify Architect and Construction Manager within seven days if Contractor disagrees with response.

3.4 DEFICIENCY REPORTS

A. If the owner, Architect, or Construction Manager notes a deficiency in an installation, material, etc. they will issue a deficiency report via the internet web-based service to the appropriate contractor. The contractor has the designated time listed to correct the deficiency and upon completion must respond back in Sage. The A/E will then perform a follow- up inspection to confirm that the deficiency was adequately corrected.

3.5 Department of Labor Overtime Request

A. The DOL overtime request form shall be filled out and forwarded by each contractor to the Construction manager prior to the start of any onsite work. Contractors will not be allowed to work Weekends or after hours unless the DOL has been properly notified.

END OF SECTION

SECTION 01 31 19 - PROJECT

MEETINGS PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:

1. Preconstruction conferences.
2. Preinstallation conferences.
3. Progress meetings.
4. Coordination meetings.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Coordination" for procedures for coordinating project meetings with other construction activities.
2. Division 1 Section "Submittals" for submitting the Contractor's Construction Schedule.

1.3 PRECONSTRUCTION CONFERENCE

A. A preconstruction conference will be scheduled before starting construction, at a time convenient to the Owner, Construction Manager and the Architect, but no later than 15 days after issuance of the Letter of Intent. The conference will be held at the Project Site or another convenient location.

B. Attendees: Authorized representatives of the Construction Manager, Owner, Architect, and their consultants; the Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

C. Agenda: Discuss items of significance that could affect progress, including the following:

1. Tentative construction schedule.
2. Critical work sequencing.
3. Designation of responsible personnel.
4. Procedures for processing field decisions and Change Orders.
5. Procedures for processing Applications for Payment.
6. Distribution of Contract Documents.
7. Submittal of Shop Drawings, Product Data, and Samples.
8. Preparation of record documents.
9. Use of the premises.
10. Parking availability.
11. Office, work, and storage areas
12. Equipment deliveries and priorities.
13. Safety procedures.
14. First aid.
15. Security.
16. Housekeeping.
17. Working hours.

D. Reporting: CM shall prepare and issue minutes to attendees and interested parties.

1.4 PREINSTALLATION CONFERENCES

A. Conduct a pre-installation conference at the Project Site before each construction activity that requires coordination with other construction.

B. Attendees: The Installer and representatives of the Prime Contractor, manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Construction Manager and Architect of scheduled meeting dates.

1. Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for the following:

a. Contract Documents.
b. Options.
c. Related Change Orders.
d. Purchases.
e. Deliveries.
f. Shop Drawings, Product Data, and quality-control samples.
g. Review of mockups.
h. Possible conflicts.
i. Compatibility problems.
j. Time schedules.

k. Weather limitations.
l. Manufacturer's recommendations.
m. Warranty requirements.
n. Compatibility of materials.
o. Acceptability of substrates.
p. Temporary facilities.
q. Space and access limitations.
r. Governing regulations.
s. Safety.
t. Inspecting and testing requirements.
u. Required performance results.
v. Recording requirements
w. Protection.

2. Record significant discussions and agreements and disagreements of each conference and the approved schedule. Promptly distribute the record of the meeting to everyone concerned, including the Owner and the Architect.
3. Do not proceed with the installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.
4. Reporting: Prime Contractor or Installer shall issue minutes to attendees, CM, Owner and Architect.

1.5 PROGRESS MEETINGS

A. Progress meetings will be held at the Project Site at regular intervals (typically weekly) as determined by the Construction Manager.

B. Attendees: In addition to representatives of the Owner, Construction Manager, and the Architect, each Prime Contractor shall be represented at these meetings. Attendance is mandatory at meetings and contractor will include in their bid a sum of $250.00 per meeting (figure 25 meetings) to have an authorized individual in attendance capable of making decisions and providing direction. This amount will be listed as a separate line item on the contractors Schedule of Values. If the contractor misses a meeting without prior written authorization from the Construction Manager, they will be issued a deduct change order in the amount of $250.00 per occurrence. Subcontractors, suppliers, or other entities will be invited at the discretion of the Owner, Construction Manager, and the Architect. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

C. Agenda: Review and correct or approve minutes of the previous

progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.

1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
2. Review the present and future needs of each entity present, including the following:

    a. Interface requirements.
    b. Time.
    c. Sequences.
    d. Status of submittals.
    e. Deliveries.
    f. Off-site fabrication problems.
    g. Access.
    h. Site utilization.
    i. Temporary facilities and services.
    j. Hours of work.
    k. Hazards and risks.
    l. Housekeeping.
    m. Quality and work standards.
    n. Change Orders.
    o. Documentation of information for payment requests.

D. Reporting: Approximately 5 days after each meeting, CM will prepare and distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

1.6 COORDINATION MEETINGS

A. Conduct project coordination meetings at regular intervals convenient for all parties involved. Project coordination meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special pre-installation meetings.

B. Request representation at each meeting by every party currently involved in coordination or planning for the construction activities involved.

C. Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

D. The CM's Field Manager will conduct daily meetings with the prime contractors and major subcontractors' foremen. The purpose of the meetings is to provide the opportunity for each contractor to communicate to the Field Manager any items relating to their respective construction activity for that day (request for shutdown, deliveries, etc.) The meetings will commence from 7:00 o'clock am until 7:30 o'clock am. These meetings are generally informal. The CM's Field Manager will keep minutes of these meetings when appropriate and will be available upon request.

1.7 SAFETY MEETINGS

A. Each Contractor will be responsible to conduct their own safety meetings on a regular basis (but not less than four times during any thirty-day period.)

B. Minutes of the Safety Meeting must be maintained by each contractor onsite and must be made available upon request. Failure to conduct and submit meeting minutes will be grounds to reject the Prime Contractor's progress payment.

PART 2 - PRODUCTS (Not

Applicable) PART 3 - EXECUTION

(Not Applicable)

END OF SECTION

SECTION 013150 – COVID-19 CONTRACTOR COMPLIANCE

The contents of this Section are NOT authored by the Owner, Architect of Record, Engineers of Record, nor the Construction Manager, but are provided as guidelines published by others, including but not limited to, the CDC, OSHA, etc.

1.1 In response to the public health emergency for the COVID-19, Governor Andrew Cuomo has declared a State disaster emergency and temporarily suspended or modified laws that would prevent, hinder, or delay action necessary to cope with the disaster or emergency. The Governor has also issued directives to allow for the expansion of certain services including those relating to emergency procurement, and to facilitate the continued work of essential businesses. Under Executive Order 202.6, as amended March 27, 2020, a construction project is permitted to continue if it is essential. Please refer to Empire State Development (ESD) guidance to determine if your project is essential https://esd.ny.gov/guidance-executive-order-2026. The purpose of this guidance is to set forth the recommended practices for all Contractors performing work at construction sites in the context of the COVID-19 health crisis.

A. Contractor Responsibilities:

Under standard contracting agency/authority agreements,

1. Contractors and their subcontractors are always required to guard the safety and health of all persons on and in the vicinity of the work site
2. Contractors and their subcontractors are required to comply with all applicable rules, regulations, codes, and bulletins of the New York State Department of Labor and the standards imposed under the Federal Occupational Safety and Health Act of 1970, as amended ("OSHA")
3. **The Bedford Central School District maintains strict COVID protocols. Each Monday morning at 7:00 am , all prime contractors are required to provide a listing of all construction personnel employed for their contract, whether employed by the prime contractor or subcontractor, who will be onsite that week and their status of vaccinated or non – vaccinated. The listing is to include, 1) The company the worker is employed by, 2) copy of proof of vaccination or 3) a weekly negative test result taken within 72 hours.**
4. Any worker who test positive for COVID 19 or comes in contact with someone who has tested positive for COVID 19 must follow established protocols per the CDC and NYS DOH.
5. Contractors and their subcontractors must comply with all City or State of New York safety requirements for projects within the City or State of New York constructed in accordance with the applicable building code, and contractors are required to provide

written safety plans for the site showing how all safety requirements of applicable law will be implemented for the duration of the contract

6. Contractors will comply with these requirements as part of their contract, as well as any updates / revisions which are subsequently issued by the governing agencies.

1.2 Contractors and their subcontractors must also adhere to the following practices to help prevent exposure and spread of COVID-19. The following recommendations are based on what is currently known about COVID-19. Contractors and their subcontractors are advised to stay current and immediately implement the most up-to-date practices to protect the safety and health of your employees, clients, and the general public.

A. Contractor Submittals

1. All contractors are required to submit a copy of their own company policy which confirms their compliance with these requirements and demonstrates your workers will properly comply.
2. Include in your submission the name of the designated individual who will be onsite.

B. General Responsibilities:

1. Contractors and their subcontractors should educate their employees on the symptoms of COVID-19, which include cough, fever, trouble breathing, and pneumonia. Contractors and their subcontractors must instruct any employee who feels they may meet the above criteria to refrain from reporting to the jobsite and immediately contact their local health department in the county in which they reside.
2. If the employee begins to exhibit these symptoms while in the workplace, steps should be taken to isolate the individual, place a surgical mask on the individual and inform your local health department and the contracting agency/authority.
3. Personnel should be advised to self-quarantine in accordance with the requirements of the New York State and local health department. Contracting agencies/authorities reserve the right to require any employee of the Contractor, and their subcontractors exhibiting symptoms, to be removed from the jobsite.
4. If an employee is confirmed to have COVID-19 infection, contractors and their subcontractors should inform fellow employees, who have been in contact with this employee, of their possible exposure to COVID-19 in the workplace while maintaining confidentiality as required by applicable New York State and federal law. The fellow employees should then self-monitor for symptoms (i.e., cough, fever, trouble breathing, and pneumonia) and self-quarantine in accordance with the requirements of the New York State and local health department.
5. If an employee tests positive for COVID-19, Contractors and their subcontractors should direct the employee to self-quarantine or remain quarantined for 14 days, following the guidance of New York State and local health department.

6. Contractors and their subcontractors may permit such employee to return to the jobsite when this employee produces a negative COVID-19 test or receives medical clearance to return to work.
7. If an employee tests negative for COVID-19, contractors and their subcontractors may direct the employee to return to work after recovery from their illness. Any direct contacts on pre-cautionary quarantine may return to the jobsite and resume their work activities.

C. Social Distancing:
1. Do not host large group meetings or congregate in large groups. When meetings are necessary, maintain a distance of 6 feet between people
2. Perform any toolbox or other training maintaining the distance of 6 feet between people
3. Perform meetings online or via conference call whenever possible
4. Only essential personnel should be permitted on the jobsite
5. Discourage handshaking and other contact greetings

D. General Jobsite Practices:

1. Procedures and supplies should be in place to encourage proper hand and respiratory hygiene. (**General Contractor is required to provide and install a self -contained temporary washing station(s) for use by all workers)**

a. Hand Hygiene:
Signage with handwashing procedures should be posted in prominent locations promoting hand hygiene:
1. Regular handwashing with soap and water for at least 20 seconds should be done:
- Before and after eating.
- After sneezing, coughing, or nose blowing
- After using the restroom
- Before handling food
- After touching or cleaning surfaces that may be contaminated
- After using shared equipment and supplies; and also
- Whenever a contractor or subcontractor believes it is necessary

2. If soap and water are not available, use an alcohol-based hand sanitizer that contains at least 60% alcohol

b. Respiratory Hygiene:
1. ALL EMPLOYEES MUST WEAR FACE MASK PROTECTION AT ALL TIMES TO COVER MOUTH AND NOSE
2. Covering coughs and sneezes with tissues or the corner of elbow
3. Disposing of soiled tissues immediately after use

2. **At the end of each work shift each Contractor will perform routine environmental cleaning and disinfecting of all frequently touched surfaces on the jobsite.** This includes corridor surfaces, doorknobs, workstations, project trailers and offices, portable toilets, countertops, handles, gang boxes, tools and equipment. See OSHA

Guidance on Preparing Workplaces for COVID-19. www.osha.gov/Publications/OSHA3990.pdf

3. Appropriate cleaning agents and directions should be utilized to perform all cleaning. Ensure all workers are trained on the hazards of cleaning chemicals used in the workplace and comply with all OSHA requirements regarding same in accordance with the Hazard Communication (Global Harmonization) Standard. Information about https://coronavirus.health.ny.gov/home
4. Do not use a common water bottle
5. If using a common water cooler clean dispenser knob after use
6. Do not share tools
7. Utilize personal protection equipment (PPE) for the job being performed
8. Sanitize reusable PPE per manufacturer's recommendation prior to each use
9. Do not share PPE
10. Ensure used PPE and other trash is disposed of properly
11. Utilize disposable gloves where appropriate and instruct workers to wash hands after removing gloves
12. Disinfect reusable supplies and equipment
13. Stagger work schedules to minimize the number of people on a job site at any one time
14. Keep one contractor or subcontractor in an area at a time. Indicate an area is occupied with workers with a sign or flag indicating which contractor or subcontractor is in the area at that time. Remove the sign or flag after completion of work in that area to let others know they may then enter into that area to perform their work. The next contractor or subcontractor will then post their sign or flag to notify others that the area is occupied.
15. Minimize the number of workers in an area as much as possible by using indicators of an occupied area (signs or flags) scheduling work activities to stagger those required to be in any one time to a minimal number of workers.
16. Minimize entryways into a work area so that employees will be able to observe flagging practices described above. Do not reduce number of emergency exits.
17. Avoid cleaning techniques, such as pressurized air or water sprays that may result in generation of bioaerosols

1.3 Contracting agencies/authorities may request an updated written safety plan for the site to address practices to help prevent exposure and spread of COVID-19 at the jobsite pursuant to New York State, OSHA recommendations and Centers for Disease Control requirements, which include:

1. Assessment of potential worker exposure hazards, taking into account the specific recommendations and controls for the four levels of worker exposure risk identified in OSHA's Guidance on Preparing Workplaces for COVID-19 (i.e. very high, high, med, Low)

2. Selecting, implementing, and ensuring the use of control (i.e., social distancing appropriate personal protective equipment, hygiene, and cleaning supplies);
3. Minimizing the number of workers in an area as much as possible by using indicators of an occupied area (signs or flags) and scheduling work activities to stagger those required to be in any one area to a minimal number of workers.
4. Minimize entryways into a work area so that employees will be able to observe flagging practices described above. Do not reduce number of emergency exists; and
5. Additional criteria consistent with health and safety practices at the work site

1.4 Project Closure:

1. Where work is suspended on a project, contractors are directed to follow any additional project shut-down protocols as provided by the contracting agency/authority
2. For NYS Business Reopening Safety Plan Template and Construction Master Guidance Plan please refer to below links:

   https://www.governor.ny.gov/sites/governor.ny.gov/files/atoms/files/NYS_BusinessReopeningSafetyPlanTemplate.pdf

   https://www.governor.ny.gov/sites/governor.ny.gov/files/atoms/files/ConstructionMasterGuidance.pdf

E. For additional resources:

OSHA COVID-19 Resources

OSHA Guidance on Preparing Workplaces for COVID-19

DOL COVID-19 Resources

Interim Guidance for Business and Employers

Centers for Disease Control - - https://www.cdc.gov/coronavirus/2019-ncov/index.html

END OF SECTION 013150

SECTION 01 32 16 - CONSTRUCTION PROGRESS SCHEDULE

PART 1 - GENERAL

1.1 DESCRIPTION

a. Each Contractor shall develop a full schedule, in sufficient detail and clarity of form and technique so that the contractor can plan and control his work properly and the Construction Manager/Owner can readily monitor and follow the progress for all portions of the work. The Contractor shall complete the detailed schedule and submit to the CM within 10 days after contract award.

b. The schedule shall comply with the various limits imposed by the scope of work any by any contractually intermediate milestone and completion dates included in the contract.

c. The activities identified in the schedule shall be analyzed in detail to determine activity time durations in units of whole working days. All durations shall be the result of definitive manpower and resource planning by the Contractor. The contractor will provide specific manpower loading information/crew size to support the duration proposed. (e.g. - 4-man crew can get 1,000 sf/day project has 11,000 sf; thus, duration was identified as 11 days).

d. The activity data shall include activity codes to facilitate selection, sorting and preparation of summary reports and graphics. Activity codes shall be developed for:

i. Area: Subdivision of the site into logical modules or blocks and levels.

ii. Responsibility: contractor or subcontractor responsible for the work.

iii. Specifications: 33 Division CSI format.

iv. System: Division of the work into building systems for summary purposes.

v. Milestone: Work associated with completion of interim completion dates or milestones.

vi. Pay Item: Work identified with a pay item on the Schedule of Values.

1.2 REPORTS

a. For initial submittal and each update, the contractor shall prepare the following standard report:

i. Tabular Schedule Report sorted by Activity code and Early Start.

1.3 GRAPHICS

a. For initial submittal the contractor shall prepare the following graphics:

i. Pure logic diagram (Precedence Format) of entire data, not time scaled, grouped by Activity code.

ii. Detailed bar chart sorted by Activity Code with Early Start and Early Finish.

iii. Summary bar chart summarizing by Activity Code with Early Start and Early Finish.

b. For each update the contractor shall prepare the following graphic:
   i. Bar Chart showing work activities with Early Start in the next 40 work days sorted by Activity Code and Early Start.
   ii. Summary Bar Chart summarizing by Activity Code showing progress with Early Start and Early Finish.

c. For each Change Order involving adjustment in the contract time for performance the contractor shall prepare a pure logic diagram showing the changed work with all predecessor and successor activities (Fragnet).

1.4 SUBMITTALS

a. In no case shall first application for payment be approved prior to submission of acceptable preliminary schedule, detailed submittal schedule, and schedule of values.

b. Monthly updates, required schedules and graphics shall be submitted to the Construction Manager/Owner within five working days following the end of the preceding month. Monthly updates, schedules and graphics shall be submitted electronically.

c. If any of the required submissions are returned to the Contractor for corrections or revisions, they shall be resubmitted within ten (10) calendar days after the return date. Resubmittals shall be in the same quantities as noted above. Review and response by the Construction Manager/Owner will be given within (10) calendar days after resubmission.

1.5 PAYMENT WITHHELD

a. If the Contractor fails to submit the required schedule information as indicated in this section within the time prescribed or revision thereof within the requested time, the Construction Manager/Owner may withhold approval of Progress Payment Estimates until such time as the Contractor submits the required information.

1.6 UPDATES

a. Updates of the Schedule shall be made every two weeks reflecting actual or reasonably anticipated progress as of the last working day of the month. Monthly updates of the Detailed Schedule will be made each month until all work is substantially complete.

b. The Contractor will meet with the Construction Manager/Owner at the end of the updated period to review information in draft form before preparation of the required schedules and graphics. The Contractor will present data, prepared in advance, for review and approval of the Construction Manager/Owner including:
   i. Actual Start Dates.
   ii. Actual Completion Dates.
   iii. Activity percent complete and/or Remaining Duration.
   iv. Revised logic, changes in activity duration's or resource assignments.

v. Narrative report discussing progress through the update period; changes, delays or other circumstances affecting progress; status of the project with respect to completion schedule; and any efforts by the Contractor to improve progress.

c. The update meeting will establish the values to be submitted for payment and will be directly related to the schedule of values in the application for payment.

d. The Contractor shall prepare a report of the meeting and make all changes, additions or corrections to the data resulting from the review. The contractor shall promptly prepare the monthly submittal following the update meeting.

1.7 CHANGES, DELAYS AND EXTENSIONS OF TIME

a. When changes or delays are experienced, the Contractor shall submit to the Construction Manager/Owner a Time Impact Analysis illustrating the influence of each change or delay on the current Contract scheduled completion date. Each time analysis shall include a Fragnet (network analysis) demonstrating how the Contractor proposed to incorporate the change or delay into the Detailed Schedule. Additionally, the analysis shall demonstrate the time impact based on the date the change was given to the Contractor, the status of construction at that point in time, and the activity duration of all effected activities. The activity duration used in this analysis shall be those included in the latest update of the Detailed Schedule, closest to the time of delay or as adjusted by mutual agreement.

b. Each Time Impact Analysis shall be submitted within ten (10) calendar days after a delay occurs or a notice of change order is given to the Contractor. In cases where the Contractor does not submit a Time Impact Analysis for a specific change or delay with a specified period of time, it shall be mutually agreed that no time extension is required. Final evaluation of each Time Impact Analysis by the Construction Manager/Owner shall be made within fourteen (14) calendar days after receipt unless subsequent meetings and negotiations are necessary. Adjustments in the Contract time for performance shall be made only by written change order approved by the Owner. Upon approval of the Owner, Fragnets illustrating the influence of changes and delays shall be incorporated into the Detailed Schedule by the contractor during the first update after agreement is reached.

c. The time difference between the Early Finish date and the Late Finish date is defined as "float." The "float" belongs to the Project and may be used by the Construction Manager/Owner to benefit the Project. Changes or delays that influence activities in the network with "float" and do not extend the Critical Path (the network of activities with zero days "float") shall not be justification for an adjustment in Contract time for performance.

END OF SECTION

SECTION 01 33 00 - ELECTRONIC SUBMITTAL PROCEDURES

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submittals required for performance of the Work, including the following:
   1. Contractor's construction schedule.
   2. Submittal schedule.
   3. Daily construction reports.
   4. Shop Drawings.
   5. Product Data.
   6. Samples.
   7. Quality assurance submittals.

B. Administrative Submittals: Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:
   1. Permits.
   2. Applications for Payment.
   3. Performance and payment bonds.
   4. Insurance certificates.
   5. List of subcontractors.

C. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 1 Section " Payment Procedures" specifies requirements for submittal of the Schedule of Values.
   2. Division 1 Section " Project Management and Coordination" specifies requirements governing preparation and submittal of required Coordination Drawings.
   3. Division 1 Section "Project Meetings" specifies requirements for submittal and distribution of meeting and conference minutes.
   4. Division 1 Section "Quality Control" specifies requirements for submittal of inspection and test reports.
   5. Division 1 Section "Closeout Procedures " specifies requirements for submittal of Project Record Documents and warranties at project closeout.

1.3 DEFINITIONS

A. Coordination Drawings show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or to function as intended.
   1. Preparation of Coordination Drawings is specified in Division 1 Section " Project Management and Coordination" and may include components previously shown in detail on Shop Drawings or Product Data.

B. Field samples are full-size physical examples erected on-site to illustrate finishes, coatings, or finish materials. Field samples are used to establish the standard by which the Work will be judged.

C. Mockups are full-size assemblies for review of construction, coordination, testing, or operation; they are not Samples.

1.4 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

      I. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
   3. Processing: To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for resubmittals.

      I. Submittals must be transmitted in accordance with the requirements of Section 1.6.
      2. Allow between 8 - 10 business days for initial review of the first round of submittals. See 1.6 for more information. Allow additional time if the Architect must delay processing to permit coordination with subsequent submittals.
      3. If an intermediate submittal is necessary, process the same as the initial submittal.
      4. Allow an additional 5 business days for reprocessing each resubmittal.
      5. No extension of Contract Time will be authorized because of contractors failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.
      6. If the contractor delays on key submittals which can negatively impact the project schedule, the owner and his agent(s) can withhold payments as necessary until the proper submittal paperwork is received.

B. Submittal Preparation:
   1. Each copy of each submittal will have a “submittal cover sheet” attached identifying all information requested by Architect. (see copy after this section) All SCS must be approved by contractor (see electronic stamp B.5) signed, dated and have all fields completely filled-out. Any submittal received without proper use of this Cover Sheet will be returned immediately to the contractor. Cover sheet for contractors use is included at the end of this section.
   2. A Submittals Website, an internet (web-based) service shall be used by all contractors to provide an on-line database and repository which shall be used to transmit and track project related documents.

The Submittals Website is provided by the Construction Manager. Upon Contract award the successful bidders will be given log on instructions. The intent for using the Submittals Website is to expedite the construction process by reducing paperwork, improving information flow, and decreasing submittal review turnaround time.

3. Project submittals (shop drawing, product data and quality assurance submittals) shall be transmitted by the Contractor in Portable Document Format (PDF) to the Submittals Website, where it will be tracked and stored for retrieval for review. After the submittal is reviewed it is uploaded back to the Submittals Website for action or use by the Contractor and Owners Representatives.
4. The service also tracks and stores documents related to the project such as RFI's (Request for Information), Contacts, Meeting Minutes, Punchlist, and Non-Compliance Notices.
5. For each submittal, the Contractor shall review and apply electronic stamp certifying that the submittal complies with the requirements of the Contract Documents, including verification of manufacturer/product, dimensions and coordination of information with other parts of the work. (contractor sign and date)
6. It is the Contractor's responsibility to provide the submittals in a PDF format. The contractor may use any of the following options:
    a. Subcontractors and suppliers provide paper submittals to the Contractor, who electronically scans and converts them to PDF format.
    b. Contract a Scanning Service, which will allow the Contractor and the Contractor's subcontractors and suppliers to provide paper submittals to the Scanning Service, which electronically scans and converts them to PDF format. It will be the Contractor's responsibility to transmit the scanned submittals to the Submittals Website.
7. Image Quality:
    a. Image resolution: The PDF files shall be created at a minimum resolution of 200 dots per inch utilizing the original document size. The Contractor will be responsible to increase the resolution of the scanned file or images being submitted as required to adequately presenting the information.
    b. Image Color Rendition: When information represented requires color to convey the intent and compliance, provide full color PDF reproduction.

C. Contractor Internet Service and Equipment Requirements:
1. The Contractor will be required to have an Email address and Internet access at Contractor's main office.
2. Unless the Contractor will exclusively be using a Scanning Service to create all PDF documents, the Contractor will be required to own a PDF reviewing, creating and editing software, such as Adobe Acrobat (www.adobe.com), Bluebeam PDF Revu (www.bluebeam.com), or other similar PDF reviewing, creating and editing software for applying electronic stamps and comments.
3. The Contractor will be required to have a web browser such as Internet Explorer 11, Firefox 40-60.
4. The Contractor will be required to have Adobe Reader version 11: Sage uses a pdf creator to generate forms. In order to print / view forms you will need Adobe Reader.
5. Contractors are required to have network securities in place such as anti-virus that is active and up to date. Do not access Contract Management from unsecured or public network location such as free WI-FI hotspots.

D. Training and Support:
   1. A training manual shall be available, free of charge from the Construction Manager, for all project participants regarding use of the Submittals Website and PDF submittals.
   2. Training if required, will be provided by the Construction Manager at Arris's main office located in Poughkeepsie NY. The appropriate personnel from each contractor office are required to attend this meeting.

E. Paper Copies:
   1. Contractor Copies: The Contractor will be responsible for making copies, for the Contractors own use and for use by its subcontractors and suppliers.

F. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the CM electronically using a transmittal form. The CM will then transmit to the Architect. The Architect will not accept submittals received from sources other than the Construction Manager.
   1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.
   2. Transmittal Form: Use AIA Document G810 and submit Sage notification to ACCI that the submittal has been uploaded. The contractors transmittal must have the subject description properly filled out, so that all parties can see what section/product is being submitted without having to open the actual submittal.
   3. Transmittal Form: Use the sample form at the end of this Section for transmittal of submittals.

1.5 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Distribution: It is the contractor's responsibility to coordinate submittals with each subcontracting trade. Each contractor shall be required to provide their subcontractors with a complete list of their submittals in order that other contractors can request required submittal information.
   1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

1.6 SUBMITTAL SCHEDULE

A. Submittals must be prepared and transmitted as follows, unless otherwise approved by the Construction Manager:
   1. Within 15 working days after Notice to Proceed:
      1. Doors & Hardware
      2. Exterior doors & Entrances
      3. Drainage structures and piping
      4. Erosion Control and Stormwater Protections
      5. Earthwork submittals including all import materials
      6. HVAC units

7. Electrical Panelboards & fixtures
8. All other submittals critical to the schedule.

2. Balance of Submittals – after 15 days but within 30 days after Notice to Proceed.
3. If the contractor misses the milestone submittal timeframes listed above, the owner / agents can withhold requisition payments until the required paperwork is received. **If there are any open submittals beyond 60 days of contract award, the owner will stop all contractor payments until all missing paperwork is received.**
4. Upon approval by the Construction Manager, non-critical submittals may be transmitted later.
5. Prepare submittals including information in paragraph 1.4B above.

B. Schedule Updating: Revise the submittal schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.7 DAILY CONSTRUCTION REPORTS

A. Prepare a daily construction report recording the following information concerning events at the site, and submit one copy to the Architect and one copy to the Construction Manager by 10:00 am the following day. Any contractor not submitting required reports will not receive approval on the subsequent application for payment until such time that all required information is submitted:
1. List of subcontractors at the site.
2. Count of personnel at the site (substantiates payroll).
3. High and low temperatures, general weather conditions.
4. Accidents and unusual events.
5. Meetings and significant decisions.
6. Stoppages, delays, shortages, and losses.
7. Meter readings and similar recordings.
8. Emergency procedures.
9. Orders and requests of governing authorities.
10. Change Orders received, implemented.
11. Services connected, disconnected.
12. Equipment or system tests and startups.
13. Partial Completions, occupancies.
14. Substantial Completions authorized.

1.8 SHOP DRAWINGS

A. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.

B. Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates and similar Drawings. Include the following information:
1. Dimensions.
2. Identification of products and materials included by sheet and detail number.
3. Compliance with specified standards.
4. Notation of coordination requirements.

5. Notation of dimensions established by field measurement.
6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 36 by 48 inches.
7. All Technical Submittals:

    I. Electronic shop drawing submittal to Construction Manager.
8. Do not use Shop Drawings without an appropriate final stamp indicating action taken.
9. Maintain approved copies on site to record “as-built” conditions.
10. Submit additional copies of as-built, approved drawings as specified in project closeout.

1.9 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Submit prior to shop drawings or simultaneously when products are specified items or A/E approval is granted. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.
1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information. Include the following that are not required, mark copies to indicate the applicable information. Include the following information:

    1. Manufacturer's printed recommendations.
    2. Compliance with trade association standards.
    3. Compliance with recognized testing agency standards.
    4. Application of testing agency labels and seals.
    5. Notation of dimensions verified by field measurement.
    6. Notation of coordination requirements.
2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
3. Submit digitally through the Submittals Website to CM.
4. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.

    1. Do not proceed with installation until a copy of Product Data is in the Installer's possession.
    2. Do not permit use of unmarked copies of Product Data in connection with construction.

1.10 SAMPLES

A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern. Sample are submitted directly to the architects home office and copy Construction Manager with transmittal.

1. Mount or display Samples in the manner to facilitate review of qualities indicated. Prepare Samples to match the Architect's sample. Include the following:

    1. Specification Section number and reference.
    2. Generic description of the Sample.
    3. Sample source.
    4. Product name or name of the manufacturer.
    5. Compliance with recognized standards.

2. Submit Samples for review of size, kind, color, pattern, and texture. Submit Samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

    1. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least 3 multiple units that show approximate limits of the variations.
    2. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
    3. Refer to other Sections for Samples to be returned to the Contractor for incorporation in the Work. Such Samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample submittals.
    4. Samples not incorporated into the Work, or otherwise designated as the Owner's property, are the property of the Contractor and shall be removed from the site prior to Substantial Completion.

3. Preliminary Submittals: Submit a full set of choices where Samples are required for selection of color, pattern, texture, or similar characteristics from a range of standard and premium choices.

    1. The Architect will review and distribute selections made or other action.

4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit 6 sets to the Architect who will distribute one set to CM and two (2) to the contractor marked with the action taken.
5. Maintain sets of Samples, as returned, at the Project Site, for quality comparisons throughout the course of construction.

    1. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
    2. Sample sets may be used to obtain final acceptance of the construction associated with each set.

B. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.
    1. Field samples are full-size examples erected on-site to illustrate finishes, coatings, or finish materials and to establish the Project standard.

l. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

1.11 QUALITY ASSURANCE SUBMITTALS

A. Submit quality-control submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.

B. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.
   1. Signature: Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.

C. Inspection and Test Reports: Requirements for submittal of inspection and test reports from independent testing agencies are specified in Division 1 Section "Quality Control."

1.12 ARCHITECT'S ACTION

A. Except for submittals for the record or information, where action and return is required, the Architect will review each submittal, mark to indicate action taken, and return promptly.
   1. Compliance with specified characteristics is the Contractor's responsibility, as stated on the approval stamp.

B. Action Stamp: The Architect will stamp each submittal with a uniform, action stamp. The Architect will mark the stamp appropriately to indicate the action taken, as follows:
   1. Unsolicited Submittals: The Architect will return unsolicited submittals to the sender without action.
   2. Final Unrestricted Release: When the Architect marks a submittal "Furnish as Corrected”, the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final payment depends on that compliance.
   3. Final-But-Restricted Release: When the Architect marks a submittal "Make Corrections Noted", the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents. Final payment depends on that compliance. (No resubmittal is required.)
   4. “Revise and Resubmit” When the Architect marks a submittal " Revise and Resubmit”, do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay.
   5. Returned for Resubmittal: When the Architect marks a submittal "Rejected”, do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark.

l. Do not use, or allow others to use, submittals marked "Rejected" at the Project Site or elsewhere where Work is in progress.

6. Other Action: Where a submittal is for information or record purposes only and does require approval and the contractor is responsible for the conformance of the product, the Architect will return the submittal marked "Reviewed".

7. “Submit specified item”: When submittal is marked “Submit Specified Item”, the Contractor shall immediately submit the specified item,

EXECUTION (Not Applicable)

END OF SECTION

BBS ARCHITECTS
LANDSCAPE ARCHITECTS
ENGINEERS

244 EAST MAIN STREET | PATCHOGUE | NEW YORK 11772 | T. 631.475.0349 | F. 631.475.0361
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Submittal Cover Sheet

Name of Contractor: _____

Project Name: **PHASE 1A BOND IMPROVEMENTS**

District Name: **BEDFORD CENTRAL SCHOOL DISTRICT**

Date: _____ Architect's Project No.: **22-225**

Items Submitted: _____

Manufacturer: _____

Model No's: _____

Submission Number: _____ Spec Section: _____

Acknowledgement by Contractor: This submittal has been reviewed by the above named contractor in accordance with the contract documents describing and defining the requirements of such review

Signature: _____ *Title of reviewer (print)* _____

Name (print): _____ *Date of review:* _____

Notes:

CA-CCI-2018

SECTION 01 45 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Requirements for monitoring the quality of the constructed project.

B. Work of this Section also includes services of an independent testing laboratory for quality assurance testing.

1.2 RELATED SECTIONS

A. The following Sections contain requirements that relate to this Section:

1. Division 1 Section “Testing Laboratory Services” specifies requirements for coordination and notification of any owner-tested items.
2. Division 1 Section “Submittals” specifies requirements for development of a schedule of required tests and inspections.
3. Division 1 Section “Special Inspections & Structural Testing”

1.3 QUALITY ASSURANCE - CONTROL OF INSTALLATION

A. Each Prime Contractor shall continually monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with specified standards as a minimum quality for the work except when more stringent tolerances, codes, or specified requirements indicate higher standards or workmanship that is more precise.

C. Perform work by persons qualified and skilled to produce workmanship of specified quality.

D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

E. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

F. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum. The actual installation may exceed the minimum within reasonable limits. Indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision.

1. Contractor Responsibilities:
   a. Unless otherwise indicated as the responsibility of

another identified entity, Contractor shall provide inspections, tests, and other quality-control services specified elsewhere in the Contract Documents and required by authorities having jurisdiction. Costs for these services are included in the Contract Sum unless specifically identified as provided by others.

b. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Contractor's responsibility, the Contractor shall employ and pay a qualified independent testing agency to perform quality-control services. Costs for these services are included in the Contract Sum.

c. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Owner's responsibility, the Owner will employ and pay a qualified independent testing agency to perform those services.

d. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Owner's responsibility, the Owner will engage the services of a qualified independent testing agency to perform those services. Payment for these services will be made from the Inspection and Testing Allowance, as authorized by Change Orders.

1.4 MOCK-UP

A. Tests will be performed under provisions identified in this Section and identified in the respective product specification sections.

B. Assemble and erect specified mock -ups with specified attachment and anchorage devices, flashing, seals, and finishes.

C. Accepted mock-ups shall be a comparison standard for the remaining work.

D. Where a mock-up has been accepted by the Engineer/Architect and is specified to be removed, then the Contractor shall remove the mock-up and the clear area when directed to do so by the Engineer/Architect.

1.5 QUALITY ASSURANCE - TESTING LABORATORY

A. In order to establish compliance with the Contract Documents, materials shall be tested, examined and evaluated before they are incorporated into the work. During and after installations, additional tests, examinations, and evaluations shall be made to

determine continued compliance throughout the course of the work.

B. Testing laboratory shall be a reputable, experienced firm that is capable of performing all of the required testing and authorized to operate in the state in which the project is located.

C. Perform all sampling and testing in accordance with specified procedures and use the materials, instruments, apparatus, and equipment required by the codes, regulations and standards. Where specific testing requirements or procedures are not described, perform the testing in accordance with all pertinent codes and regulations and with recognized standards for testing.

D. In the event that samples and test specimens are not properly taken, handled, stored or delivered or if other requirements of this Section are not complied with, Engineer/Architect reserves the right to delegate any or all of this work to others, or to take whatever action deemed necessary to ensure that sampling and testing are properly accomplished, for which all costs shall be borne by Contractor.

E. Construction Manager/Architect reserves the right to disapprove the use of a specific testing laboratory, even after prior approval, if the laboratory fails to meet or comply with the requirements of this Section. If this should occur, immediately discharge the testing laboratory and retain the services of a different laboratory acceptable to Engineer/Architect.

F. The testing laboratory shall meet the following criteria:

1. Be capable of performing all of the required tests.
2. Be regularly engaged in performing the types of services required.
3. Have adequate facilities, materials, equipment, and personnel to perform the services.
4. Have an adequately trained, experienced and qualified staff.
5. Have at least one registered professional engineer licensed in the state in which the project is located who shall be capable of performing field tests, supervising laboratory testing and interpreting test results. The professional engineer shall be thoroughly knowledgeable in materials, soils, asphalt paving and concrete.
6. Shall be able to be on the Project site within two hours after being notified.
7. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

1.6 REFERENCE STANDARDS

A. Conform to reference standards by date that the project was last bid.

B. Obtain copies of standards when required by Contract Documents.

C. Should specified reference standards conflict with Contract Documents, request clarification from Engineer/Architect before proceeding.

D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.7 SUBMITTALS

A. Within fifteen (15) calendar days from the date of the Notice to Proceed, submit documentation from three (3) testing laboratories that clearly indicates experience, location, qualifications of staff, and descriptions of any limitations or restrictions of the firm.

B. Certified copies of each test report shall be mailed directly to the Engineer/Architect. The Contractor shall arrange with the laboratory to secure copies.

C. Each report shall be in writing and shall include the testing method used, the test results, the specified results, the exact location of where the test specimens were taken, the date taken, Project identification, Contractor's name and other pertinent information required for a complete and meaningful test report.

D. Each report shall be signed and certified by a responsible officer of the testing laboratory.

E. Mail reports directly to Engineer/Architect within 24 hours after the sample is taken, except in those instances when tests cannot be immediately performed because of required curing, incubation periods, or lengthy testing procedures.

F. The laboratory shall verbally communicate test results when requested by the Engineer/Architect. This does not eliminate nor replace the requirements for a written report.

1.8 SCHEDULING - LABORATORY SERVICES

A. Except where otherwise specified, the Architect / Construction Manager will determine the number of samples to be taken, the date and time samples will be taken and tests made, the number and type of tests to be performed, who will collect the samples, how they will be handled and stored and when laboratory personnel are required on site.

B. Architect / Construction Manager will notify Contractor of his decision to take samples and/or have tests made and provide him with the pertinent information. Contractor is responsible for notifying the testing laboratory and for having the testing performed, on schedule.

C. In addition to the above, Contractor shall make his own arrangements for the sampling and testing of materials he proposes to incorporate into the work. This shall not be paid for out of the cash allowance.

D. Notify Architect / Construction Manager at least 48 hours in advance of the times at which scheduled samples or tests will be conducted.

E. If samples and/or tests cannot be taken or performed when required, delay the work until such time that they can be accomplished. Where possible, any work that has been installed but has not been sampled or tested as required, shall be tested by other means. Upon r Architect / Construction Manager request, uncover any work, which has been buried or covered, and perform special tests designated. If the work cannot be tested by other means, Architect / Construction Manager may declare the work unacceptable. All costs associated with noncompliance and for special testing shall be borne by the Contractor and not be paid for out of the cash allowance.

F. Should the testing laboratory be scheduled to take or collect samples or to perform tests, and finds that it is unable to do so as a result of delays in construction, inclement weather, or any other reason, reschedule the tasks for a date acceptable to Architect / Construction Manager. Costs associated with times testing laboratory is unable to perform scheduled services shall be borne by the Contractor and will not be paid for under the allowance.

G. Plan all work and operations to allow for the taking and collection of samples and allow adequate time for the performance of tests. Delay the progress of questionable work until the receipt of the certified test reports.

1.9 TESTING REQUIREMENTS

A. Dry Paint Thickness Measurement: Perform dry paint thickness using calibrated SSPC Type 2 fixed probe gages.

1.10 TESTING SCHEDULE

A. Dry Paint Thickness Measurement:

1. Make five (5) separate spot measurements spaced evenly over 100 square feet of area.
2. For structures exceeding 1000 square feet of finished surface, three 100 square feet areas shall be randomly selected by the Engineer/Architect plus one 100 square foot area for each additional 1000 square feet of finished surface. This requirement shall be subject to change as required by the Engineer/Architect.

1.11 FIELD OBSERVATION OF CONTRACTOR'S WORK

A. The Architect / Construction Manager will provide periodic observation of the Contractor's work in accordance with the General Conditions of the Contract.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions. Verify that the existing substrate is capable of structural support or attachment of new Work being applied or attached. Examine and verify specific conditions described in individual specification sections. Verify that utility services are available, of the correct characteristics, and in the correct locations.

3.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance. Seal cracks or openings of substrate prior to applying next material or substance.
B. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.3 FIELD QUALITY CONTROL

A. Allow representatives of the testing laboratory access to the work at all time. Provide all equipment, labor, materials, and facilities required by the laboratory to properly perform its functions. Cooperate with and assist laboratory personnel during the performance of their work.

B. Test specimens and samples shall be taken by the person(s) designated in other Sections, or as directed by Architect / Construction Manager. Conduct field sampling and testing in the presence of Architect / Construction Manager. Provide all materials, equipment, facilities and labor for securing samples and test specimens and for performing all field-testing.

END OF SECTION

SECTION 01 45 29 - TESTING LABORATORY

SERVICES PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

A. From time to time during the progress of the Work, the Construction Manager or Owner may require that testing be performed to determine that the Work complies with the specified requirements.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Section 01 33 00 - Electronic Submittal Procedures specifies requirements for development of a schedule of required tests and inspections.
2. Section 01 45 00 – Quality Requirements specifies the administrative and procedural requirements for quality control services.
3. Section 01 45 33 – Special Inspections & Structural Procedures identifies the areas which must be tested.

PART 2 - PRODUCTS

2.1 TESTING LABORATORY

A. The New York State Certified testing laboratory will be

selected by the Owner.

PART 3 - EXECUTION

3.1 PAYMENT FOR TESTING SERVICES

A. Except where specifically indicated as being the Contractor’s responsibility, tests and inspections required by the Owner, Construction Manager and/or Architect will be paid for by the Owner.

B. Retesting: When initial tests indicate non-compliance with

Contract Documents, the responsible Prime Contractor is required to pay for all subsequent re-testing until compliance is accomplished.

C. Contractor's Convenience Testing: Testing requested by the contractor for his information or convenience shall be paid for by Contractor.

D. Code Compliance Testing Where indicated in the Documents, tests required by Building Code or Ordinances or by an approval authority shall be paid for by the Owner.

3.2 COOPERATION WITH TESTING LABORATORY

A. Access:

1. Provide representatives of the testing laboratory access to the work at all times.
2. Provide facilities for such access in order that the laboratory may properly perform its function.

B. Schedule and Notification:

1. When tests are required by the Contract Documents or by the Construction Manager, Architect or Owner, contractor will notify Construction Manager within 48 hours prior to expected time for operations requiring testing services.

2. If, after such notification, the testing laboratory is prevented from performing its work due to incompleteness of the project work, all extra costs for testing attributable to the delay shall be paid by the Contractor.

3.3 SPECIMENS

A. All sampling equipment and personnel shall be provided by the testing laboratory.

B. All deliveries of specimens and samples to the testing laboratory shall be performed by the testing laboratory.

END OF SECTION 01 45 29

SECTION 01 45 33 – SPECIAL INSPECTIONS AND STRUCTURAL TESTING

PART 1.10 – GENERAL

1.1 GENERAL REQUIREMENTS

A. Special Inspections and Structural Testing shall be in accordance with Chapter 17 of the *Building Code of New York State* (BCNYS).

B. Hold a Special Inspections preconstruction meeting at least 7 days prior to the initial planned date for start of construction.

1. Discussions shall include the following:
   a. Review of specifications and Schedule of Special Inspections for work requiring Special Inspections.
   b. Responsibilities of Contractor, Owner, Testing Agency, Special Inspector, and Registered Design Professional.
   c. Notification and reporting procedures.
2. Attendees shall include the Contractor, Construction Manager, Testing Agency,
   Special Inspector, and Registered Design Professionals for Structural Engineering and for Architectural.

1.2 DEFINITIONS

A. Registered Design Professional: The licensed Professional Engineer or Registered Architect whose seal appears on the Construction Drawings. Unless noted otherwise, references to the Registered Design Professional in this section refer to the Structural Engineer for the building design.

B. Code Enforcement Official: The Officer or other designated authority charged with administration and enforcement of the BCNYS. For project under the jurisdiction of New York State agencies such as the Department of Education (SED), State University Construction Fund (SUCF), Office of General Services (OGS), and Dormitory Authority (DASNY), the Code Enforcement Official is an official from the agency having jurisdiction.

C. Testing/Inspecting Agency: An agent retained by the Special Inspector or by the Owner and coordinated by the Special Inspector, to perform some of the inspection services on behalf of the Special Inspector. (An example of an Inspecting Agent is a Geotechnical Engineer.)

D. Statement of Special Inspections: A document prepared by the Registered Design Professional and filed with and approved by the Code Enforcement Official that includes the Schedule of Special Inspections listing the materials and work requiring Special Inspections. This document includes the inspections and verifications required for the project and the individuals, agencies, and/or firms who will be retained to perform these services.

E. Continuous Special Inspection: The full-time observation of work by the Special Inspector or Testing Agency while the work is being performed.

F. Periodic Special Inspections: The part-time or intermittent observation of work by the Special Inspector or Testing Agency for

work that has been or is being performed and at the completion of the work.

1.3 QUALIFICATIONS

A. The Special Inspector and Testing/Inspecting Agency shall be accepted by the Registered Design Professional (RDP) and the Code Enforcement Official.

B. Special Inspections shall be performed by agents who have relevant experience for each category of inspections indicated on the drawings.

C. Minimum qualifications of inspection agents are indicated on the drawings.

1.4 SUBMITTALS

A. The Special Inspector and Testing/Inspecting Agency shall submit to the Registered Design Professional and Code Enforcement Official for review, a copy of their qualifications including the names and qualifications of each of the individual inspectors and technicians who will be performing inspections or tests.

B. The Special Inspector and Testing/Inspecting Agency shall disclose any past or present business relationship or potential conflict of interest with the Contractor or any of the Subcontractors whose work will be inspected or tested.

1.5 PAYMENT

A. The Owner will engage and pay for the services of the Special Inspector and Testing/Inspecting Agency.

B. If any materials requiring Special Inspections are fabricated in a plant not located within 200 miles of the project site, the Contractor shall be responsible for the travel expenses of the Special Inspector or Testing/Inspecting Agency.

C. The Contractor shall be responsible for the cost of any retesting or reinspection of the work failing to comply with the requirements of the Contract Documents.

1.6 OWNER RESPONSBILITIES

A. The Owner will provide the Special Inspector with a complete set of Contract Documents sealed by the Registered Design Professional and approved by the Code Enforcement Official.

1.7 CONTRACTOR RESPONSIBILITIES

A. The Contractor shall cooperate with the Special Inspector and his agents so that Special Inspections and testing may be performed without hindrance.

B. As indicated in the Schedule of Special Inspections, the Contractor shall notify the Special Inspector and/or Testing/Inspecting Agency at least 48 hours in advance of a required inspection or test.

C. The Contractor shall provide incidental labor and facilities to provide access to the work to be inspected or tested, to obtain and handle samples at the site or at source of products to be tested, to

facilitate tests and inspections, and for storage and curing of test samples.

D. If Special Inspections or testing require the use of the Contractor's scaffolding to access work areas, the Contractor shall provide a competent person to perform the daily evaluation of the scaffolding to verify that it is safe to use. The Contractor shall notify the Special Inspector and Testing Agent of this review before each use. The Contractor is responsible for the safe assembly and stability of the scaffolding.

E. The Contractor shall keep the latest set of Construction Drawings, field sketches, accepted shop drawings, and specifications at the project site for field use by the Inspectors and Testing Technicians.

F. The Contractor shall perform remedial work (if required) and sign non-conformance reports stating that remedial work has been completed. The Contractor shall submit signed reports to the Special Inspector as work proceeds.

G. The Special Inspection program shall in no way relieve the Contractor of his obligation to perform work in accordance with the requirements of the Contract Documents or from implementing an effective Quality Control program.

H. The Contractor shall be solely responsible for construction site safety.

1.8 LIMITS ON AUTHORITY

A. The Special Inspector or Testing/Inspecting Agency shall not release, revoke, alter, or enlarge on the requirements of the Contract Documents.

B. The Special Inspector or Testing/Inspecting Agency shall not have control over the Contractor's means and methods of construction.

C. The Special Inspector or Testing/Inspecting Agency shall not be responsible for construction site safety.

D. The Special Inspector or Testing/Inspecting Agency shall not have the authority to stop the work.

PART 1.20 - INSPECTIONS AND TESTING

1.21 STRUCTURAL EXCAVATION, BACKFILL, AND COMPACTION AND DEEP FOUNDATIONS (Bathroom Addition and Field Areas)

A. The Special Inspector shall perform inspections and verifications or coordinate the RDP for Geotechnical Engineering to perform inspections and verifications including the following:

1. Identify soils requiring undercutting and replacing while observing proof rolling and when subgrade is exposed.
2. Verify footing bearing strata.

3. Review and accept materials proposed by Contractor for use as compacted fill based on test data and information submitted by the Testing Agency. Material approval shall be based on the requirements and recommendations stated in the Project Geotechnical and Subsurface Investigation.
4. Observe and accept filling and compaction procedures.
5. Observe and accept preparation of slab-on-grade subgrade and subbase.

B. The Testing Agency shall perform field density tests for building subgrades and for fill materials including slab subbase within building area in accordance with ASTM D 1557 or ASTM D 2922 as follows:

1. Footing subgrade and each stratum of soil on which footings will be placed.
2. Building subgrade including slab subbase and each lift of compacted material.
3. Field Area and trenches for utilities: Inspect each subgrade and fill layer before further backfill or construction work is performed. Approval shall be based on satisfactory achievement of compaction criteria.
4. Verify use of fill material and lift thicknesses in field.

C. The Testing Agency shall perform moisture content testing of the slab subbase in accordance with ASTM D 3017.

1.22 CAST-IN-PLACE CONCRETE

A. The Special Inspector shall perform the following:

1. Inspect reinforcing steel and placement.
2. Inspect embedded bolts and anchor rods prior to concrete placement.
3. Inspect erected precast members.

The Testing Agency shall perform the following:

1. Verify the use of the required design mix.
2. Sample and test concrete during placement as follows (test shall be taken at point of discharge into structure):
   a. Record specific location(s) where the concrete was placed. Refer to column lines where possible.
   b. Record time concrete is batched as shown on truck ticket, time placement begins/sample time, and is time truck is empted.
   c. Sample fresh concrete in accordance with ASTM C 172, except modified for slump to comply with ASTM C 94.
   d. Perform slump test in accordance with ASTM C 143.
   e. Measure air content in accordance with ASTM C 231, pressure method, one for each truckload of ready-mixed concrete (air-entrained or non-air-entrained).
   f. Record temperature of concrete for each truck. Test in-place concrete temperature hourly when ambient temperature is 40 degrees F and below and when 80 degrees F and above.
   g. Record air temperature and general weather conditions (cloudy, windy, sunny, etc.).
   h. Record unit weight of fresh normal-weight concrete in accordance with ASTM C 138.
   i. Perform concrete compressive tests as follows:
      I. Prepare compressive test specimens in accordance with ASTM C 31. Store undisturbed in an insulated box during cold

weather. Deliver to laboratory between 16 and 32 hours after making. Perform compressive tests in accordance with ASTM C 39: two specimens tested at 7 days, two specimens tested at 28 days, and two specimens retained in reserve for later testing if required.

II. In cold weather or whenever steel erection is scheduled to commence less than 14 days after placement of supporting foundation concrete, cast an additional set of four cylinders for each 50 cubic yards or fraction thereof of supporting foundation concrete. Field cure cylinders and test two specimens at 7 days, retaining two specimens in reserve for later testing if required. Steel erection may not begin until supporting concrete obtains 75 percent of its design strength.

III. If concrete will be placed in separate buildings on a given project, individual compressive strength tests cylinder shall be made for each building.

j. Perform additional testing as follows if required:

I. Taken an additional set of cylinders for compressive strength testing for each truck in which the total time period between batching and completion of placement has exceeded the ACI recommended 90-minute-maximum time limit and is likely to exceed 120 minutes. Additional cylinders shall be taken within 10 minutes of placement completion.

II. Make additional tests of in-place concrete when test results indicate specified concrete strengths and/or other characteristics have not been attained in the structure.

III. Perform tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods acceptable to Architect.

IV. Contractor shall reimburse Owner for the costs of additional tests.

3. Inspect concrete and shotcrete placement for proper application techniques.
4. Inspect for maintenance of specified curing temperature and techniques.
5. Perform Floor Flatness (F_F) and Levelness (F_L) Testing no later than 48 hours after slab placement in accordance with ASTM E 1155. (F_L) testing is not required for slabs on metal deck.
6. Perform moisture vapor emission and alkalinity testing in accordance with ASTM F 1869 and ASTM F 710 respectively as follows:
   a. Perform testing after building is enclosed, prior to installation of adhered floor finishes, and once HVAC systems are operational.
   b. Test results must be reviewed and accepted by the floor finish installer.
7. Verify in-situ concrete strength prior to stressing of tendons in post-tensioned concrete or removal of shores/forms from beams or structural slabs.
8. Inspect welding of reinforcing bars.

1.23 UNIT MASONRY

A. The Special Inspector shall perform the following:

1. As masonry construction begins, the following shall be verified to ensure compliance:
   a. Construction of mortar joints.
   b. Location of joint reinforcement and connectors.
   c. Prestressed masonry:

I. Location, grade, and size of prestressing tendons and anchorage.
II. Prestressing technique.

2. Verify:
   a. Size and location of structural elements.
   b. Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction.
   c. Specified size, grade, and type of reinforcement.
   d. Protection of masonry during cold weather (temperature below 40˚F) or hot weather (temperature above 90˚F).
3. Prior to grouting, verify:
   a. Grout space is clean.
   b. Placement of reinforcement and connectors.
   c. Placement of prestressing tendons and anchorages.
   d. Construction of mortar joints.
4. Verify grout placement to ensure compliance with code and Construction Document Provisions.
   a. Grouting of CMU cells.
   b. Grouting of prestressed bonded tendons.

B. The Testing Agency shall perform the following:

1. Verify for compliance with approved submittals:
   a. Proportions of site-prepared mortar.
   b. Proportions of site-prepared grout including prestressing grout for bonded tendons.
2. Inspect:
   a. Welding of reinforcing bars.
   b. Application of measurement of prestressing force.
3. Observe preparation of any required grout specimens, mortar specimens, and/or prisms in accordance with ASTM C 780, ASTM C 1019, and ASTM C 1314 REV B.
4. Field Quality Control Testing: Perform tests and evaluations listed below during construction for each 5,000 square foot of wall area or portion thereof.
   a. Sample and evaluate mortar composition and properties in accordance with ASTM C 780.
   b. Sample and test grout compressive strength in accordance with ASTM C 1019.
   c. For each type of wall construction indicated, test masonry prisms in accordance with ASTM C 1314 and as follows:
      I. Prepare one set of prisms for testing at 7 days and one set for testing at 28 days.

1.24 STRUCTURAL STEEL (INCLUDING STEEL JOISTS, AND METAL DECK)

A. The Special Inspector shall perform the following:

1. Verify that the Fabricator maintains detailed fabrication and Quality Control procedures:
   a. Review procedures for completeness and adequacy relative to code requirements.
   b. If Fabricator is designated as an AISC Certified Fabricator, Special Inspection for shop-fabricated members and assemblies is not required.
   c. If Fabricator is not designated as an AISC Certified Fabricator, the Contractor shall reimburse the Owner via execution of a credit change order for the cost of Special Inspections and Testing in the Fabricator’s shop.

2. Review Manufacturer's Certificates of Compliance for high strength bolts and weld filler material.
3. Review certified mill test reports.
4. Inspect steel frame joint details for compliance with the approved Construction Documents.

B. The Testing Agency shall perform the following:

1. Material verification of high-strength bolts, nuts, and washers (including review of identification markings and Manufacturer's Certificate of Compliance).
   a. Test high-strength bolt assemblies in a tension measuring device to verify material conformance prior to installation. Assemble bolt, nut, and washer on a loose plate and tension by tightening the nut to develop the required tension in Table 4 of the "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
2. Verification that copies of accepted field welding procedure specifications are available on site for reference by the erector's welders.
3. Verification that the erector's welder's qualifications are current and are appropriate for the joint type, welding position and welding process to be used.
4. Verification that joint fit up for partial and complete penetration groove welds are in compliance with AWS tolerances as follows:
   a. Visually inspect 50% of all joints scheduled for partial and complete penetration groove welds.
   b. Visually inspect 50% of all column splices scheduled for partial and complete penetration groove welds.
   c. Visually inspect 100% of all tension member splices, column splices and moment connections that are part of the lateral force resisting system.
5. Inspect high-strength bolting.
   a. Joints designated as snug-tight require only visual inspection.
   b. Joints designated as slip-critical require visual inspection during installation.
   c. Checking after installation using calibrated wrenches will not be permitted.
6. Material verification of structural steel and metal deck, including review of identification markings.
7. Perform pull-out tests on adhesive, expansion, and sleeve anchors.
8. Material verification of weld filler materials, including review of identification markings.
9. Inspect welding of structural steel and metal deck.
   a. Visually inspect all welds according to AWS.
   b. Schedule inspection of field welding in a timely manner utilizing vertical access means and methods utilized by the Contractor to perform the welding.
   c. Ultrasonic inspection (UT) according to ASTM E 587 is required for partial and complete penetration field groove welds as follows:
      1. UT inspect 50% of all joints scheduled for partial and complete penetration groove welds.
      2. UT inspect 50% of all column splices scheduled for partial and complete penetration groove welds.
      3. UT inspect 100% of all tension member splices, column splices and moment connections that are part of the lateral force resisting system.

4. UT inspect 50% or a minimum of six of the joints scheduled for partial or complete penetration groove welds completed by each welder. Increase inspection percentage to 100% for each welder with more than one rejected weld.

d. Magnetic particle inspection according to ASTM E 709 is required for Fabricators not certified by the AISC Quality Certification Program for 10 percent of shop fillet welds.

e. Magnetic particle inspection according to ASTM E 709 is required for 10 percent of field fillet welds.

f. Ultrasonic inspection according to ASTM E 587 is required for 10 percent of shop partial or complete penetration welds and 100% of shop partial or complete penetration groove welds in tension members.

g. Inspect shear connectors in accordance with AWS D1.1, Section 7. Observe bend tests performed by Contractor.

h. Inspect every shear connector by striking once with 10-pound hammer. Direction of hammer swing shall be parallel with member containing connector. Inspection by striking with hammer does not replace bend tests in accordance with AWS.

10. Inspect welding of reinforcing steel.

11. Inspect condition of erected materials.

a. Visually inspect erected steel for damage.

b. Visually inspect connections and framing to verify compliance with the Contract Documents and accepted shop drawings.

12. Inspect column plumbness and splices:

a. Inspect erected columns for plumbness within tolerances specified Section 05100, Part 3: Execution.

b. Inspect columns for fit-up within tolerances specified in the AISC *Manual of Steel Construction*, Specification Section M4.

13. Inspect mechanical fasteners for metal deck including connections to supporting structure and side lap fastening.

14. Additional testing shall be performed as follows if required:

a. Testing Agency shall perform additional tests of connections and framing members that have been field modified by the Contractor to correct errors in shop drawings, fabrication, or erection.

b. Anchor rods and embedded structural supports incorrectly located or damaged after installation shall be field modified by the Contractor as indicated in Section 03300, Paragraph 3.4 and shall be tested by the Testing Agency.

c. Testing and reporting of field modifications shall be in accordance with this section, Special Inspections, and shall have the following additional requirements:

I. Magnetic particle inspection according to ASTM E 709 is required for 100 percent of fillet welds.

II. Ultrasonic inspection according to ASTM E 587 is required for all full-penetration welds.

III. Perform pull-out tests on 100 percent of each type of adhesive, expansion, or sleeve anchor used by applying a load equal to 125 percent of the allowable pull-out strength listed in the manufacturer’s literature.

d. The Contractor shall reimburse the Owner for the costs of additional tests performed and any other additional testing required.

1.25 COLD-FORMED METAL FRAMING

A. The Special Inspector shall perform the following:

1. Verify that the Fabricator maintains detailed fabrication and Quality Control procedures:

a. For Fabricators not previously registered and approved to perform such work without Special Inspection, review the Quality Control procedures for completeness and adequacy relative to the code requirements for the Fabricator's scope of work.
2. Visually inspect installation of clips, hangers, hurricane ties, and miscellaneous other connectors.
3. Visually inspect framing and details.
4. Visually inspect installation of truss bracing.

B. The Testing Agent shall perform the following:

1. Verify member sizes and thickness.
2. Verify weight of galvanized coating according to ASTM A 90.
3. Visually inspect framing for damage, including trusses and bracing.
4. Visually inspect welds according to AWS.
5. Perform pull-out tests on adhesive, expansion, and sleeve anchors.

1.26 MASONRY VENEERS AND ARCHITECTURAL WALL PANELS

A. The Special Inspector shall perform the following:

1. As masonry construction begins, the following shall be verified to ensure compliance:
   a. Construction of mortar joints.
   b. Location of joint reinforcement and connectors.
   c. Prestressed masonry:
      I. Location, grade, and size of prestressing tendons and anchorage.
      II. Prestressing technique.
2. Verify:
   a. Size and location of structural elements.
   b. Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction.
   c. Specified size, grade, and type of reinforcement.
   d. Protection of masonry during cold weather (temperature below 40˚F) or hot weather (temperature above 90˚F).
3. Prior to grouting, verify:
   a. Grout space is clean.
   b. Placement of reinforcement and connectors.
   c. Placement of prestressing tendons and anchorages.
   d. Construction of mortar joints.
4. Verify grout placement to ensure compliance with code and Construction Document Provisions.
   a. Grout of CMU cells.
   b. Grouting of prestressed bonded tendons.

B. The Testing Agency shall perform the following:

1. Verify for compliance with approved submittals:
   a. Proportions of site-prepared mortar.
   b. Proportions of site-prepared grout including prestressing grout for bonded tendons.
2. Inspect:
   a. Welding of reinforcing bars.
   b. Application of measurement of prestressing force.

3. Observe preparation of any required grout specimens, mortar specimens, and/or prisms in accordance with ASTM C 780, ASTM C 1019, and ASTM C 1314 REV B.
4. Field Quality Control Testing: Perform tests and evaluations listed below during construction for each 5,000 sq. ft. of wall area or portion thereof.
   a. Sample and evaluate mortar composition and properties in accordance with ASTM C 780.
   b. Sample and test grout compressive strength in accordance with ASTM C 1019.
   c. For each type of wall construction indicated, test masonry prisms in accordance with ASTM C 1314 and as follows:
      I. Prepare one set of prisms for testing at 7 days and one set for testing at 28
         days.

1.27 SPRAY FIRE-RESISTANT MATERIALS

A. The Special Inspector/Testing Agency shall perform the following:

1. Verify surface preparation in accordance with the manufacturer’s written instructions.
2. Verify temperature and area ventilation before and after application in accordance with manufacturer’s written instructions.
3. Verify thickness of sprayed fire-resistant materials.
4. Verify density of sprayed fire-resistant materials.
5. Verify cohesive/adhesive bond strength of sprayed fire-resistant materials.

1.28 SMOKE CONTROL

A. Smoke control systems shall be tested by the Special Inspector. The Special Inspector/Testing Agency shall perform the following:

1. Perform leakage testing and verify recording device location during erection of ductwork and prior to concealment
2. Perform pressure difference testing, flow measurements and detection, and verify control operations prior to occupancy and after sufficient completion.

PART 1.30 – DOCUMENTATION

1.31 RECORDS AND REPORTS

A. Detailed reports shall be prepared of each test or inspection. The reports shall include the following general information:

1. Project name and number.
2. Date of test or inspection.
3. Name of Testing Agency or Inspecting Agency.
4. Name of technician or inspector.
5. Weather conditions.
6. Locations and elevations of specific areas tested or inspected referenced to gridlines.
7. Description of test or inspection.
8. Reference to applicable ASTM standard.
9. Summary of observations, results, and recommendations.

10. Description of any areas or materials requiring retesting or reinspection.

B. Concrete compressive strength test reports shall contain the following information:

1. Name of Contractor and concrete supplier.
2. Name of concrete testing service.
3. Name of technician making and testing specimens.
4. Truck number and delivery ticket number.
5. Date and location within the structure of concrete placement.
6. Concrete type, class, mix proportions of materials, and design compressive strength at 28 days.
7. Slump, air content, unit weight, and concrete temperature.
8. Total time period between batching and completion of placement for each truck.
9. Compressive strength and type of break for all tests.

C. Field reports for concrete inspection shall contain the general information noted above, plus ambient temperature and cylinder numbers.

D. Test reports for masonry materials shall include proportions, composition, and compressive strength.

1.32 COMMUNICATION

A. The Testing/Inspecting Agency shall immediately notify the Contractor, Special Inspector, and Registered Design Professional by telephone, fax, or email of any test results failing to comply with the requirements of the Contract Documents.

B. The Special Inspector shall immediately notify the Contractor of any work found to be in nonconformance with the Contract Documents during inspections. If the nonconforming work is not corrected while the Special Inspector is on-site, the Special Inspector shall notify the Registered Design Professional within 24 hours (one business day) and issue a nonconformance report. The Special Inspector may use the Special Inspection Non-Conformance Report form at the end of this section or other similar form.

C. If the nonconforming work is not corrected at the time of substantial completion of the structure or other appropriate time, the Special Inspector shall notify the Code Enforcement Official.

1.33 DISTRIBUTION OF REPORTS

A. The Testing/Inspecting Agency shall submit reports to the Special Inspector and the Registered Design Professional within 7 days of the inspection or test. Legible handwritten reports may be submitted if final typed copies are not available.

B. The Special Inspector shall submit reports to the Registered Design Professional within 7 days of the inspections. Legible handwritten reports may be submitted if final typed copies are not available.

C. If requested by the Code Enforcement Official, the Special Inspector shall submit interim reports which include all inspections and tests performed since the beginning of construction or since the previous interim report. Interim reports shall be addressed to the Code Enforcement Official with copies sent to the Registered Design

Professionals (Structural Engineer and Architect) and Contractor. Interim reports shall be signed by the agent performing inspections.

1.34 FINAL REPORT OF SPECIAL INSPECTIONS

A. At the completion of work, each Testing/Inspecting Agency shall submit an Agent's Final Report of Special Inspections to the Special Inspector stating that work was completed in substantial conformance with the Contract Documents and that appropriate inspections and tests were performed. The Testing/Inspecting Agency may use the Agent's Final Report of Special Inspections form provided at the end of this section or other similar form.

B. At the completion of work, the Special Inspector shall compile all inspection and test reports generated by each Agent into a Final Report of Special Inspections. The Final Report of Special Inspections shall state that required inspections have been performed and shall itemize any nonconforming work not corrected or resolved.

C. The Special Inspector may use the Final Report of Special Inspections form based on CASE Form 102-2001 or other similar form.

D. The Special Inspector shall submit The Final Report of Special Inspections to the Registered Design Professional and Code Enforcement Official prior to issuance of a Certificate of Use and Occupancy

1.35 **NYS Education Department – Statement of Inspections and Special and Tests attached to the end of this section is part of the contract.**

END OF SECTION 01 45 33

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 – General

1.1 SUMMARY

This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.

Temporary utilities include, but are not limited to, the following:

1. Sewers and drainage.
2. Water Service and distribution.
3. Stormwater control within building
4. Sanitary facilities, including toilets, wash facilities, and drinking-water facilities.
5. Ventilation.
6. Electric power service.
7. Lighting.

Security and protection facilities include, but are not limited to, the following:

1. Environmental protection.
2. Tree and plant protection.
3. Site enclosure fence.
4. Security enclosure and lockup.
5. Barricades, warning signs, and lights.
6. Temporary enclosures.
7. Site road access and traffic control
8. Temporary partitions.
9. Fire protection.

Unless work of this section is indicated to be provided under a specific contract, each Prime Contractor must provide, maintain and remove required temporary facilities necessary to perform his own construction activities.

AccessibleTemporary Egress: Comply with applicable provisionsin ICC/ANSI A117.1.

1.2 QUALITY ASSURANCE

Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:

1. Building code requirements.
2. Health and safety regulations.
3. Utility company regulations.
4. SED 155.5 Regulations
5. Police, fire department, and rescue squad rules.
6. Environmental protection regulations.

   Standards: Comply with NFPA 241 “Standard for Safeguarding Construction, Alterations, and Demolition Operations,” ANSI A10 Series standards for “Safety Requirements for Construction and Demolition,” and NECA Electrical Design Library “Temporary Electrical Facilities.”

7. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 “National Electric Code.”

Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.3 PROJECT CONDITIONS

Temporary Utilities: Each contractor will prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.

Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-preventive measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist onsite.

1.4 DIVISION OF RESPONSIBILITIES

General: These Specifications assign the

Contractor responsibilities. Each Prime Contractor

is responsible for the following:

1. Installation, operation, maintenance and removal of each temporary facility considered as its own normal construction activity, as well as the costs and use charges except as listed below.
2. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
3. Generator power for their own work.
4. Its own storage, lockable Conex boxes and fabrication sheds. (Locate/Move as directed by CM)
5. Hoisting requirements, including hoisting loads in excess of 2 tons, hoisting material or equipment into spaces below grade, and hoisting requirements outside the building enclosure. (Rigging insurance must be provided when contractor hoisting equipment)
6. Collection and disposal of its own waste material.
7. Secure lock-up of its own tools, materials and equipment.
8. Construction aids PPE and miscellaneous services and facilities necessary exclusively for its own construction activities.
9. Maintaining temporary facilities provided by Contractor.
10. Containers for non-hazardous waste and debris generated by their own removals and construction operations.

1.5 USE CHARGES

General: Cost or use charges for temporary facilities are not chargeable to Owner, Architect or Construction Manager and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:

1. The Architect and Construction Manager
2. Other Contractors.
3. Owners construction forces, including testing agencies
4. Personnel of authorities having jurisdiction.

Water Service: Each contractor needs to provide their own water connections to existing services.

Electric Power Service: Temporary electric power including set-up and maintenance is the responsibility of the **Electrical Contractor**. Use charges by owner.

PART 2 - PRODUCTS

2.1 MATERIALS

General: Provide new materials. If acceptable to the Architect / CM, the Contractor may use undamaged, previously used materials in good condition. Provide materials suitable for use intended.

Lumber and Plywood:

1. For signs and directory boards, provide exterior-type, Grade B-B high density concrete form overlay plywood of sizes and thicknesses indicated.

2. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8- inch-thick exterior plywood.

Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.

2.2 EQUIPMENT

Water Hoses: Provide 3/4-inch, heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.

PART 3 - EXECUTION

3.1 TEMPORARY UTILITY INSTALLATION

Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve Protect adequately and result in minimum interference with performance of the work. Relocate and modify facilities as required.

Contractor shall provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

1. Arrange with utility company CM and Owner to make connections for temporary services.

3.2 CONTRACTOR FIELD OFFICES

Contractors may with permission from the construction manager establish a field office for their own use. Said offices for the individual prime contractor, sub-contractors, specialty contractors and the like shall be of such size and design as approved by the CM and shall be located in the Construction Managers designated area. Each representative contractor will arrange for telephone service and electric service, if required, directly with the utility company.

Maintain onsite, all articles for First Aid treatment. The contractor shall also establish standing arrangements for the immediate removal and hospital treatment of any employees and other persons on the job site who may be injured or who may become ill during the course work.

3.3 TEMPORARY AND PERMANENT SERVICES, GENERAL

The Contractor’s use of any permanent system or service of the building or portions thereof shall be subject to the Owners approval.

The Contractor shall be responsible for any and all damage to permanent services used, and shall make good any and all damage to the satisfaction of the owner, prior to final completion and acceptance.

NOTE - In accordance with OSHA and other applicable regulations, the representative Contractors performing erection of structural “skeleton” type work are solely responsible for the netting, guard rail protection and such other safety devices as deemed necessary to protect the workers and public from harm.

3.4 TEMPORARY LIGHT AND POWER

Temporary Electric Power Service: **Electrical Contractor** shall provide and pay all costs to provide a weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics to accommodate performance of work during the construction period.

1. Responsibility: All work under this section to be provided by the **Electrical Contractor**.

2. Temporary services for temporarily or permanently installed building equipment such as sump pumps, boilers, cabinet heating and/ or cooling units and fans shall be furnished, installed, operated and maintained so that the said equipment may be operated for drainage and temporary heat when required and/ or when so ordered by the Architect/ Construction Manager.

3. Electrical Contractor shall maintain all parts of the

electrical system (temporary and permanent power) active and in-service at all times throughout the contract duration as governed by the Construction Manager. All temporary lighting to be controlled by standard switches per code (outside of power panels).

4. Electrical Contractor shall maintain power during the hours established by Construction Manager.

5. Temporary Service: Install service and grounding in compliance with the National Electric Code (NFPA 70). Include necessary meters, transformers, overload protected disconnect and main distribution switch gear. Comply with all NECA, NEMA and UL Standards

6. Provide temporary service with an automatic ground-fault interrupter feature, activated from the circuits of the system.

7. Power Distribution System: Provide circuits of adequate size and proper characteristics for each use. In general run wiring overhead. Rise vertically where wiring will be least exposed to damage from construction operations.

8. Provide metal conduit, tubing or armored cable for protection of temporary power wiring where exposed to possible damage during construction operations. Where permitted by code, wiring of circuits not exceeding 110-120 Volt 20 Amp rating and wiring of lighting circuits may be non- metallic sheathed cable in areas where located overhead and exposed. Do not wire temporary lighting with plain, exposed (insulated) electrical conductors. Provide metal enclosures or boxes for wiring devices.

9. Provide overload-protected disconnect switch as required by code.

TEMPORARY ELECTRICAL AND TELEPHONE SERVICES

1. Temporary Power Source: At each building / renovation area, use the existing electrical power distribution system for temporary power source.

2. Owner's Requirements: Do not disrupt the Owner's needs for continuous power at each building.

3. Electrical Contractor shall provide temporary power and lighting facilities for use of all trades. All temporary light and power shall be in accordance with the required Codes and Safety Standards.

4. **Electrical Contractor will include in their base bid: Construction Manager trailer hook up at the Bedford Fox Lane Campus staging area with** : a) power, b) two phone lines, and c) Internet connection within 5 days after notification by CM. Lines will be run in conduit below grade and/or install utility poles as necessary.

5. All other contractor trailer use / connection charges for power and telephone to be paid for by the respective contractor.

TEMPORARY POWER DISTRIBUTION

1. General Requirements: Electrical Contractor shall provide feeders and branch circuits of adequate size and proper characteristics as required to supply temporary receptacle and lighting loads. Size service and feeder conductors to restrict voltage drop to maximum 5 percent at 80 percent power factor. Provide properly sized overcurrent protection for each temporary electrical circuit.

RECEPTACLE REQUIREMENTS

1. General Requirements: Provide temporary receptacle outlets as required Minimum Requirements: Provide a minimum of one quad 120-volt receptacle per 250 square feet of building floor area, with maximum spacing of 50 feet on center for operation of portable tools and appliances during the construction period.

2. Branch Circuits: All temporary receptacle branch circuits to be rated 20 amps with a maximum of (3) duplex receptacles per circuit. Temporary receptacle branch circuits shall be independent of temporary lighting circuits.

LIGHTING REQUIREMENTS

1. General Requirements: Electrical Contractor shall provide both interior and exterior lighting at areas as required to provide adequate illumination for safe and proper construction operations and Project Site security.

2. Minimum Requirements: Provide illumination levels adequate for construction operations and safe traffic conditions. As a minimum provide one 200- w a t t lamp per 400 square feet of building floor area, with maximum spacing of 20 feet. Any rooms in excess of 500 sf will receive one 400-watt metal halide fixture for each 1000 sf of area. (or LED equivalents) .

3. Supplemental Lighting: If required, supplemental lighting beyond minimum requirements shall be provided via suitable portable lighting units with cord and plugs, and shall be paid for by the Contractor or Sub- Contractor requiring such additional lighting.

4. Branch Circuits: All temporary lighting branch circuits to be loaded to a maximum of 1400 watts per 20 amp circuit. Temporary lighting branch circuits shall be independent of temporary receptacle circuits.

5. Restrictions: Do not use permanent lighting systems for temporary construction lighting purposes.

MAXIMUM LOADS

1. General: Lighting and power loads connected to the temporary power distribution system shall be limited to the following maximum individual loads:
    a. Load Type Maximum
    b. 120 volt, 1-phase 1.5 KVA
    c. 208 volt, 1-phase 2.5 KVA
    d. 208 volt, 3-phase 5.0 KVA

2. General: The temporary power distribution system shall be sufficiently sized to provide temporary power as required within this section. Meter and Meter connections to be part of electrical contractors base bid.

ELECTRICAL WELDERS

1. Separate Power Sources Required: Power for electric welders and for other loads larger than the maximum allowable sizes shall be taken from portable power sources provided, paid for and operated by the Contractor or Sub- Contractor requiring the use of such equipment. Remove such power sources when no longer needed.

ELECTRICAL ENERGY COSTS

1. Paid By Owner: Charges for electrical energy usage for temporary power and lighting will be paid by the Owner, when taken from the Owner's electrical services. Contractor and Sub-Contractors shall exercise measures to conserve energy usage. Use of owner electric for items not specific to project (e.g. heating construction shanties, etc.) will not be permitted

3.2 TEMPORARY TOILET & SANITARY FACILITIES

Sanitary Facilities: Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with governing regulations including safety and health codes for the type, number, location, operation and maintenance of fixtures and facilities; provide not less than specified requirements. Install in locations which will best serve the project's needs. Existing facilities should not be used.

The **General Contractor** is responsible for sanitary facilities at all 7 building locations. These responsibilities include: maintenance, cleaning and supplies for use by all trades for the entire duration of the project. Sufficient quantity/locations to properly handle the amount of workers onsite. Provide separate toilet facilities for male and female construction personnel.

Supply and maintain toilet tissue, paper towels, paper cups and other disposable materials as appropriate for each facility,

including Owner's Representative's temporary offices for full contract duration. Provide covered waste containers for used material. Provide separate toilet facilities for male and female construction personnel.

General Contractor will also provide separate toilet facilities for Construction Manager personnel located at direction of Construction Manager.

3.7 TEMPORARY WATER

Each Contractor shall handle their own temporary water services:

1. Provide and pay for all connections
2. Protect temporary and permanent lines against any damage.
3. Provide all hose and other extensions from connections installed by the Plumbing Contractor and all labor, materials and supplies required to supply water to the work.
4. Prevent water damage to the work.

3.8 STORAGE FACILITIES

Each Contractor shall provide temporary storage and other facilities as required for their own use. Temporary structures shall be located at the Construction Manager’s designated staging area, and shall be removed upon completion of the work or when directed.

Materials delivered to the site shall be safely stored and adequately protected against loss or damage in watertight , environmentally controlled, lockable, Conex boxes. Particular care shall be taken to protect humidity/temperature sensitive materials (e.g. – wood doors, casework, ceiling tile, etc) in the proper climate controlled environment. All costs for properly storing materials is paid for by applicable contractor in their base bid.

Due to limited on site storage space, each Contractor shall coordinate delivery of his materials with the Construction Manager who will determine when large deliveries shall be made and shall be designate storage locations on site for delivered materials. **All stored materials must be stored in locked, watertight trailers, paid for by applicable contractor.**

3.9 SCAFFOLDING AND STAGING

All scaffold, staging and appurtenances thereto shall comply in total to the requirements of Safety and Health Regulations for Construction Chapter XVII of OSHA, Part 1926 and all related amendments.

3.10 RUBBISH CONTAINER

Each Contractor shall provide suitable rubbish container device(s) for his own use, properly maintained and serviced, replaced as required and protected from access by the public fencing as may be specified herein or approved by the Architect or Construction Manager.

Each Prime Contractor and Subcontractor shall sweep up and gather together daily all his own rubbish and removed materials and place same in containers.

3.11 CONSTRUCTION FENCING

Temporary construction fencing shall be of good quality and neat in appearance; 6’ high chain link fencing, 9 ga fabric. Open-Mesh Chain Link Fencing: Provide 0.120-inch-thick, galvanized steel posts, (on stanchions at paved areas) and 2.875" dia. Gate posts. Provide lockable gates. (Keys to owner, architect and CM).

Site access gates shall be provided as required, complete with all operating hardware and security devices.

Should fencing be required to be relocated or modified during the course of the project due to additional access needed by the contractor, same shall be done at the total expense of the contractor.

General Work Contractor shall provide a staging area at each of the 7 schools in the location(s) designated by the owner and the Construction Manager.

a) Staging area enclosures at each of the 7 schools. 75’ x 75’x 6’ high on stanchions with 20’ gate.

b) Bedford Hills Principals Addition enclosure area to be 6’ high chain link fencing on stanchions
+/- 150’ x 100’ with 2 ea. 12’ gates.

3.12 DAILY CLEANUP

Each Contractor shall furnish daily janitorial services for the project and perform any required maintenance of facilities as deemed necessary by the Construction Manager during the entire life of the contract. If any contractor fails to keep the site safe and broom clean within 4 hours of being notified by CM, either verbally or in writing, the construction manager will have the cleanup work performed by others and the contractors will be back charged accordingly.

1. In addition to the above, the **General Contractor** shall provide a daily sweep and a weekly damp mop of all work areas.

3.13 BURNING

Burning will not be permitted.

3.14 FIRE PREVENTION CONTROL

Each Contractor shall comply with the safety provisions of the National Fire Protection Association's "National Fire Codes" pertaining to the work and, particularly, in connection with any cutting or welding performed as part of the work.

3.15 TEMPORARY FIRE PROTECTION

Each Contractor shall take all possible precautions for the prevention of fires.

1. Where flame cutting torches, blow torches, or welding tools are required to be used, their use shall be as approved by the Construction Manager at the site.
2. When welding tools or torches of any type are in use, have available in the immediate vicinity of the work a fire extinguisher of the dry chemical 20 lbs. Type. The fire extinguisher(s) shall be provided and maintained by the Contractor doing such work.

Fuel for cutting and heating torches shall be gas only and shall be contained in Underwriters laboratory approved containers.

No volatile liquids shall be used for cleaning agents or as fuels for motorized equipment or tools within a building except with the express approval of the Owner and/or Architect and in accordance with local codes. On-site bulk storage of volatile liquids shall be outside the buildings at locations directed by the Owner, who shall determine the extent of volatile liquid allowed within the building at any given time.

Each Contractor shall comply with the following requirements relating to compressed gas:

3. Where compressed gas of any type is used for any purpose at the site, it shall be contained in cylinders complying with ICC regulations. Gases of different types shall not be stored together except when in use and when such proximity is required.
4. All persons required to handle gas cylinders or to act as temporary firemen (Fire Watchers) shall be able to read, write and understand the English language; they

   shall also be required by the Contractor to read Part 3 of Pamphlet P-1 "Safe Handling of Compressed Gases" published by the Compressed Gas Association, 500 Fifth Avenue, New York, NY 10036.

Each Contractor shall comply with the following requirements

relating to welding and cutting:

5. All cutting and/or welding (electric or gas) must be done only by skilled, certified and licensed personnel.

6. During welding or cutting operations, a contractor's man shall act as a fire watcher.

   The fire watcher shall have proper eye protection and suitable firefighting equipment including fire extinguisher (bearing current inspection Certificate), protective gloves and any other equipment deemed necessary.

7. Tanks supplying gases for welding or cutting are to be placed in an upright position securely fastened, and close as practical to the operation. Tanks, actives or spares, shall be protected from excess heat and shall not be placed in stairways, hallways or exits. When not in use, protective valve cap shall be screwed on the cylinder.

8. Adequate fire extinguishing equipment shall be maintained at all welding or cutting operations.

3.16 VENTILATION AND HUMIDITY CONTROL FOR CONSTRUCTION:

General Contractor will provide temporary ventilation as required for protecting the building from any adverse effects of high humidity during construction activities. Select dehumidification and ventilating equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements and have sufficient quantity of units to produce necessary ambient conditions.

1. Each Contractor shall be responsible for his own temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity.

2. Ventilate enclosed area to dissipate humidity, and to prevent accumulation of dust, fumes, vapors or gases.

3. Provide equipment as necessary for air and fresh exchange for the work area per OSHA standards.

4. If Contractor fails to adequately ventilate the building during the construction process, thereby causing humidity and possible mold issues, the owner will hire others to properly address and deduct costs from the Contractor accordingly.

5. General Contractor will provide negative air environment of sufficient size/qty to fully ventilate the square footage of work areas and exhaust any dust/fumes through flexible duct hose to exterior top eliminate any orders / smoke.

6. Any contractor allowing water infiltration to building is responsible for cleanup and commercial dehumidifiers of sufficient size/qty to prevent mold growth. Failure to immediately address (4 hours' notice) will result in the

owners hiring others and back-charging in order to insure a safe environment.

3.17 TEMPORARY ROADS, TRACKING PADS, PARKING AREA AND CONCRETE WASHOUT PITS: (all work by GC)

1. **Temporary roads/ Parking Area /Tracking pad areas at each field location** will consist of one-layer soil separation fabric, 8″ of 2″ crushed stone. Contractor will maintain and field dress with additional material as necessary to prevent ruts and potholes.
2. Above work includes access / delivery to work areas, and to equipment and storage areas and sheds.
3. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust. Contractor must maintain dust control on a continuous basis.
4. Road Cleaning: Maintain roads and walkways in an acceptably clean condition. This includes the removal of debris daily, if required, and/or a minimum of once a week due to all project traffic. Road cleaning equipment to be wet/vacuum type. The General Contractor will clean any construction-related dirt/debris from Town and State roadways as well as district access drives and parking lots throughout the duration of the project. Temporary parking by construction personnel shall be allowed only in areas so designated.
5. General Work Contractor is responsible for all snow and ice removal for access to their work locations. This includes, temporary roadways, CM trailer and access to staging areas. Stockpile snow in areas as designated by Construction Manager.

3.18 DE-WATERING FACILITIES AND DRAINS

Each Prime Contractor is directly responsible for de-watering of their excavations. The responsibility of de-watering of the site as to facilitate the work will be the responsibility of the Sitework Contractor, coordinate with CM.

Comply with requirements in applicable Division 31 Sections for temporary drainage and de-watering facilities and operations not directly associated with construction activities included in individual Sections. Where feasible, use same facilities. Maintain Project site, excavations, and construction free of water.

Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining property nor endanger permanent drainage piping system, provide temporary drainage where roofing or similar waterproof deck construction is completed.

3.19 ROOF PROTECTIONS

A. All Contractors shall provide temporary protection on the roof surface when it is necessary for work to take place on completed sections. (Minimum 2” polyiso insulation and plywood)

B. Upon such notification as required in subparagraph A, the Contractor shall assume responsibility for damages, if any, to the roofing system caused by the work of other trades, except that financial liability for any and all damages rests with the offending trade.

3.20 TEMPORARY SITE SAFETY AND DIRECTIONAL SIGNS

A. The **General Contractor** shall provide signs as required below. Install signs where required or indicated to inform public and persons seeking entrance to project. All signage and posts become the property of the owner at the conclusion of the project.

B. Construct signs in accordance with section 619 of the NYS DOT standard specifications (MUTCD overall sign size, letter size, metal signage). Support on breakaway metal posts or attach to fencing; do not attach signs to buildings or permanent construction.

C. Include relocating temporary site safety and directional signs as many times as required or directed.

D. For construction traffic control/flow at entrances/exits, as designated by the Owner (6 required) Large sign 4’ x4’ Orange with Black Letters (“Construction Entrance Only”)

E. To direct visitors (4 required)

F. For construction parking (2 required)

G. To direct deliveries (4 required)

H. Emergency egress only – Construction area (4 required)

I. Per OSHA standards as necessary

J. For “No Smoking” safe work site at multiple locations (12 required)

K. Construction Area – Do Not Enter (30) mount on fence

L. No Trespassing (30) mount on fence

M. A premobilization meeting to establish location and quantities of all signage will be held with contractor, Construction Manager, and owner. Prior to the start of any actual work the signage must be reviewed / approved by the Construction Manager.

3.21 STORMWATER CONTROL

The General Work Contractor shall provide earthen embankments, silt fence, haybales, and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains during sitework activities.

3.22 BARRICADES, WARNING SIGNS AND LIGHTS:

Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard.

3.23 TEMPORARY ENCLOSURES

A. **General Contractor** will provide temporary 2″ x4″ wood framing, 2″ polyiso insulation, ½″ plywood, and cover with 6 mil plastic; for any open exterior window removal, wall removal, door entrance locations, etc. created as part of their contract for weather and security protection at the end of each workday.

Any other temporary enclosures for specific openings for a contractor to perform their work are the responsibility of the contractor creating the opening and shall be installed to protect the building from exterior elements, security issues, odors / noise resulting from construction.

3.24 TEMPORARY DUST PARTITIONS and FLOOR PROTECTIONS

A. **General Contractor** shall erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate work areas from fumes.

1. Construct dustproof, floor to ceiling partitions of not less than 3-5/8″ – 20 ga. studs , 2 layers of 6 mil poly sheets inside / outside, sound batt insulation, exterior sheathing 5/8″ plywood , interior sheathing 5/8″ gypsum taped/painted where owner occupied. Caulk seal joints and perimeter to prevent dust migrations. Equip partitions with dustproof doors and security locks.
2. Cover floor with 2 layer poly and extend up the side 18″. Overlap and tape full length joints
3. **In addition to any temporary partition locations shown on drawings, General Contractor will include in his base bid 12 ea. 9′ x12′ temporary partitions meeting the above criteria for use where directed.**
4. Temporary Floor Protections – Shall be “Ram-Board” **Heavy Duty** with taped joints or equivalent. Finish Flooring (new or existing) will be fully covered by GC. Areas of isolated MEP

work will be protected with Ram- Board by the individual prime contractor

5. Any unfinished openings (e.g. – windows , doors , fire shutters, etc) which remain in place by the start of school in September will be completely enclosed with fire-rated AC plywood painted.

3.25 OPERATION, TERMINATION, AND REMOVAL

Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

Termination and Removal: Unless the Architect/ CM requests that it be maintained longer, remove each temporary facility when the need has ended or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been affected because of interference with the temporary facility.

Repair damaged work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the Contractors property.

2. At Substantial Completion, clean and renovate permanent facilities used during the construction period including.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01 51 00 – UNIFORM SAFETY STANDARDS FOR SCHOOL CONSTRUCTION AND MAINTENANCE PROJECTS; COMMISSIONER'S REGULATIONS, SECTION 155.5

PART 1 - GENERAL

1. Certificate of Occupancy Statement: The existing building will be occupied during construction. Throughout the duration of construction the contractor shall maintain the integrity of the existing structure. The occupied portion of any school building and required exits shall always comply with the minimum requirements necessary to maintain a certificate of occupancy.

2. Asbestos / Lead / Polychlorinated Biphenyls Test Letter: All existing school areas to be disturbed during renovation or demolition (existing facilities building envelope components, interior finishes and concealed utility infrastructure) have been tested for lead, asbestos and Polychlorinated Biphenyls containing materials in accordance with OSHA, EPA, DEC and DOH requirements. Material test results are provided within the Project Manual. If negative for asbestos, Item 10 below does not apply. If negative for Lead, Item 11 below does not apply. If negative for Polychlorinated Biphenyls (PCB) item 12 does not apply.

3. Safety and Security Standards for Construction Projects: Throughout the duration of this construction project, the following general safety and security standards shall be maintained by all Contractors on site:

   a. All construction materials shall be delivered during the times as stipulated by the School District. All materials shall be stored in a safe and secure manner. Locations for on-site storage shall be coordinated with the Owner's Representative.

   b. Temporary construction fencing shall be erected around construction activity areas in accordance with Specification Section 01500. When indicated in the drawings, construction fencing will be shown on the Construction Implementation Plans. All fencing around construction activity areas shall be maintained to restrict unauthorized access and prevent students from entering site. Fencing around construction supplies or debris shall be maintained.

   c. Gates securing construction activity areas shall be secured and locked at all times unless manned by contractor personnel to prevent unauthorized access. Signs stating "Caution – Construction Activity Area Construction Personnel Only, Unauthorized Access Prohibited" shall be posted at all entry points and 75' intervals along security fence.

   d. During exterior renovation work, overhead protection shall be provided for any sidewalks or areas immediately beneath the work site or such areas shall be fenced off and designated with warning signs to prevent entry.

   e. Worker Photo Identification: Workers shall be required to wear photo identification badges at all times for identification and security purposes while working at occupied sites.

4. Separation of Construction Areas from Occupied Spaces: Construction areas which are under the control of a Contractor and therefore not occupied by District staff or students shall be separated from occupied areas by means of temporary construction barriers.
Provisions shall be made to prevent the passage of dust and contaminants into occupied parts of the building in accordance with Specification Section 01500. Periodic inspection and repairs of the containment barriers must be made to prevent dust or contaminants from entering occupied areas. Gypsum board must be used in exit ways or other areas that require fire rated separation. Heavy-duty plastic sheeting may be used only for a vapor, fine dust or air infiltration barrier, and shall not be used to separate occupied spaces from construction areas.

   a. A specific stairwell and/or elevator shall be assigned for construction worker use during working hours. In general, workers may not use corridors, stairs, or elevators designated for students or staff use.

   b. Contractors shall remove large amounts of construction debris and rubbish from the building using enclosed chutes or other similar sealed system to contain dust and other particulate. No material shall be dropped or thrown outside the walls of the building. Removal of construction debris and rubbish shall be through construction areas only, there shall be no movement of debris through halls of occupied spaces of the building.

   c. Dust and debris generated by construction activities in occupied parts of the building shall be cleaned by the Contractor at the close of each workday in accordance the General Requirements of Division 1, Section 1B and Specification Section 01015. The Contractor is responsible to maintain all health, safety, public address systems and educational capabilities of occupied areas within the school building at all times that classes are in session.

5. Exiting Plan: A plan showing how exits required by NYS Building Code will be maintained. This is typically shown within CIP and/or Code Compliance Plans.

6. Ventilation During Construction: A plan showing how required ventilation will be maintained during construction. This is typically shown within CIP and/or Code Compliance Plans.

7. Construction Noise: Construction and maintenance operations shall not produce noise in excess of 60 DBA in occupied spaces, or shall be scheduled for times when the building or affected building spaces are not occupied or acoustical treatments shall be placed so as to abate the excessive noise levels. Acoustic treatments shall be prescribed by the Architect and supplied and installed by the Contractor.

8. Construction Fume Control: The Contractor shall be responsible for the control of chemical fumes, gasses and other contaminates produced by welding, gasoline or diesel engines, roofing, paving, painting, etc., to ensure they do not enter occupied portions of the building or air intakes.

9. Off-Gassing Control: The Contractor shall be responsible for ensure that activities and materials which result in "off-gassing" of volatile organic compounds such as glues, paints, furniture, carpeting, wall

covering, drapery, etc. are scheduled, cured, or ventilated in accordance with manufacturer's recommendations before a space can be occupied.

10. Asbestos Code Rule 56 Compliance: Where so indicated by positive test results, portions of the project may entail the removal of asbestos containing material as defined by 12NYCRR56. Large and small asbestos abatement projects (as defined by 8 NYCRR 155.5(k)) shall not be performed while the building is occupied. (Definition of "building", as referenced in this section, means a wing or major section of a building that can be completely isolated from the rest of the building with sealed non-combustible construction.) The isolated portions (the occupied portion and the portion under construction) of the building must contain separate code compliant exits. The ventilation systems must be physically separated and sealed at the isolation barrier(s).

    Removal of asbestos containing material shall only be performed when the building, as defined above, is unoccupied. The Contractor shall verify that the building has been vacated prior to commencing asbestos abatement work. If the building is configured such that the affected area can be completely isolated from the unaffected areas with sealed non-combustible construction barriers, then the unaffected areas can remain occupied provided required exits are maintained independently in both areas.

    Removal of asbestos containing materials on the exterior of the building such as flashing, roofing, siding or soffit and caulking may be performed on occupied buildings provided all variances have been granted and the occupants have been notified of the intention to remove asbestos containing material. Complete isolation of ventilation systems supplying the occupied spaces and windows must be maintained throughout the removal duration.

    Asbestos TEM: Where so indicated by positive test results, the asbestos abatement area shall be completely sealed off from the rest of the building and completely cleaned and tested by TEM prior to re-entry by the public.

11. Lead Abatement Projects: At interior painted surfaces which have tested Positive for Lead: Portions of walls that will be disturbed as a requirement of this contract shall be removed in accordance with the Lead Safety Plan included within the Project Manual. This section clearly references OSHA regulations to be followed, and clean-up and testing associated with lead abatement must be done in strict conformance with HUD protocol. Locations where construction activity requires the removal of lead containing materials shall be completely isolated from occupied portions of the building using a construction barrier. The Contractor shall have all surrounding areas tested for lead levels prior to commencing work and after work has been completed to ensure that surrounding areas have not been contaminated by removals.

12. PCB Projects: Any window caulking tested and found to contain PCBs must be removed in accordance with U.S. EPA regulations under the Toxic Substances Control Act (40 CFR 761.62). Soil areas adjacent to windows containing PCBs must follow the 40 CFR 761.62 criteria. A site-specific abatement plan must be developed to address potential environmental and public health concerns. Steps for abating contamination and preventing contamination of nearby areas must be done in accordance with HUD Technical Guidelines for the Evaluating and Control of Lead Based Paint Hazards in Housing.

Removal of PCB containing materials on the exterior of the building such as caulking may be performed on occupied buildings provided all variances have been granted and the occupants have been notified of the intention to remove PCB containing material. Complete isolation of ventilation systems supplying the occupied spaces and windows must be maintained throughout the removal duration.

13. Fire Prevention: Any holes in floors or walls shall be sealed with a fire-resistant material whose rating meets or exceeds that of the construction to which it is attached.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01 55 00 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provision of Contract, including General and Supplementary Conditions and Division 1 - Specification Sections, apply to work of this Section.

B. The work must comply with the requirements of the following related specifications sections when applicable:

1. Division 1 Section 01 51 00 - "*Uniform Safety Standards for School Construction and Maintenance Projects – Commissioner's Regulations*

1.02 DESCRIPTION OF WORK

A. Extent of selective demolition work is indicated on drawings and/or specified herein.

1.03 SUBMITTALS

A. Schedule: Submit schedule indicating proposed methods and sequence of operations for selective demolition work to Owner's Representative for review and approval prior to commencement of work.

B. See Section 01524 for additional submittal requirements for LEED Projects.

1.04 JOB CONDITIONS

A. Occupancy: Owner will be occupying areas of the building immediately adjacent to areas of selective demolition. Demolition work must be conducted in a manner to minimize disruption of normal Owner's operations.

B. Exits: All exits must be kept clear and maintained.

C. Protection: Provide temporary barricades and other forms of protection as required to protect Owner's personnel, staff and General Public from injury due to selective demolition work and new construction.

1. Prevent dust and dirt from rising and entering the building.

2. Protect adjacent floor areas with suitable coverings.

D. All work in an Educational Facility must comply with the

Commissioners Regulations and Uniform Safety Standards for School Construction and Maintenance Projects. Reference Section 01050 for additional information.

E. Project Waste: All project waste and rubbish to be disposed in containers provided by the Contractor for subsequent legal off site disposal in accordance with Specifications Sections 01352 and 01524. Container locations to be coordinated with the Owner. Off site disposal must be on a regular basis.

F. Damage: Promptly repair or replace areas that are to remain and are damaged by demolition or removal work.

PART 2 - PRODUCTS

(NOT APPLICABLE)

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine the areas and conditions under which work of this Section will be performed for any interferences, or conditions which will be detrimental to timely and proper completion of the work.

B. Report any interferences or unsatisfactory conditions to the Architect in writing. Do not proceed until interferences or unsatisfactory conditions have been removed or corrected.

3.02 PREPARATION

A. Erect and maintain dust-proof closures to prevent the spread of dust to adjacent areas.

3.03 DEMOLITION

A. Perform selective demolition work in a systematic manner.

3.04 DISPOSAL OF DEMOLISHED MATERIALS

A. Each day, remove debris, rubbish, and other materials resulting from demolition operations from building in accordance with Specifications Sections 01352 and 01524. Material to be disposed in containers provided by the Contractor. *(For LEED Certified Projects)*

3.05 CLEAN UP

A. Upon completion of demolition work, remove tools, equipment and all remaining demolished materials from site. Leave areas broom clean.

END OF SECTION

SECTION 017329 – CUTTING AND PATCHING

Part 1 - GENERAL

1.1 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. Related Sections include the following:

1. Division 02 through 28 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

a. Requirements in this Section also apply to mechanical and electrical installations associated with this project.

C. Division of Responsibilities for Cutting and Patching Work: **Each subcontractor shall perform cutting and patching required for its portion of the Work.**

1.2 DEFINITIONS

A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.3 SUBMITTALS

A. Cutting and Patching Plan: Where approval of procedures for cutting and patching is required before proceeding (see Article 1.4 below), submit a proposed plan describing procedures at least 14 days before the time cutting and patching will be performed requesting approval to proceed. Include the following information, as applicable, in the proposal:

1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building’s appearance and other significant visual elements.
3. Products: List products to be sued and firms or entities that will perform the Work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
6. Structural Elements: Where cutting and patching involved adding reinforcement to structural elements, submit details

and engineering calculations showing integration of reinforcement with original structure.

7. Architect’s Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.4 QUALITY ASSURANCE

A. Minimize cutting and patching of work by properly coordinating construction sequences with Architect.

B. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

1. Obtain Architect’s approval before cutting and patching any structural work that is not indicated on drawings.

C. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

1. Obtain Architect’s approval before cutting and patching any operational element that is not indicated on drawings.

D. Miscellaneous Elements: Do not cut and patch the following elements or related components, that are not indicated on drawings, in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operation life or safety.

1. Water, moisture, or vapor barriers.
2. Membranes and flashings.
3. Equipment supports.
4. Piping, ductwork, vessels, and equipment.
5. Noise and vibration-control elements and systems.

E. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect’s opinion, reduce the building’s aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 – PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections of these Specifications.

B. OSHA Approved systems ,equipment , scaffolding, PPE, lanyards, rigging, etc.

C. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION & SAFETY

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates including compatibility with existing finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Roof Watertightness – Contractor must insure that proper weather, protections, and manpower are present prior to cutting existing roof areas. Contractor is responsible for any interior damages and any direct/indirect costs which accrue if they fail to maintain watertightness.

C. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection for any portions of Project that might be damaged / soiled during cutting and patching operations.

3.3 PERFORMANCE

A. General: Each trade shall employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
2. Related Electrical and Mechanical work will be performed by licensed subcontractors

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Mechanical and Electrical Services: By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   5. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Each trade shall patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Utilize workers who are authorized / skilled in the discipline to be patched (e.g. – mason , carpenter, painter, etc.)
   1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
   2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
   3. Floors and Walls: Where portions of walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and

replace with new materials, if necessary, to achieve uniform color and appearance.

a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch, from wall-to-wall or corner-to-corner. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

3.4 CLEANING

A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION

SECTION 01 74 23 - CLEANING UP

PART 1 - GENERAL

1.1 DESCRIPTION OF THE WORK:

A. The work of this section relates to the following:

1. Maintain all premises and public properties/roadways free from accumulations of waste, debris, dirt, mud and rubbish caused by operations on a daily basis.

2. At completion of work, remove waste materials, rubbish tools, equipment, machinery and surplus materials, and clean all sight exposed surfaces; leave project clean and ready for occupancy.

3. Remove all overspray caused by construction operations from adjacent construction, surfaces and vehicles.

B. Related Requirements Specified Elsewhere

1. Summary of work: Section 011000

2. Cleaning for Specific Products or Work: the respective sections of the specifications:

1.2 SAFETY REQUIREMENTS

A. Standards: Maintain project in accord with safety and insurance standards.

B. Hazard Control/Cleaning Products

1. Store volatile waste in covered metal containers and remove from premises daily.

2. Provide adequate ventilation during use of volatile or noxious substances.

C. Conduct cleaning and disposal operations to comply with local ordinances and anti- pollution laws.

1. Do not burn or bury rubbish and waste materials on project site.

2. Do not dispose of volatile waste such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

3. Do not dispose of waste into streams or waterways.

PART 2 - PRODUCTS

2.1 Materials: Use only cleaning materials recommended by manufacturer of surface to be cleaned.

PART 3 - EXECUTION

3.1 REQUIREMENTS DURING CONSTRUCTION:

A. Execute daily cleaning to ensure that building, grounds, and public properties and roadways are maintained free from accumulations of waste materials, rubbish, dirt, mud and dust.

B. Wet down dry materials and rubbish to lay dust and prevent blowing dust.

C. Each day, all contractors shall adhere to the following:

1. Areas of intense activity, such as cutting and sawing must be swept clean and reorganized at the end of each day. Utilize dust control methods such as plastic containment, containment hut and/or wetting of surfaces.

2. Areas of moderate activity such as installation of plumbing, ductwork, electrical work must be returned to good order at the end of each day.

3. Debris below scaffolds (and shoring/re-shoring) must at all time, be kept sufficiently consolidated to keep walkways free of tripping hazards. These work areas must also be swept clean immediately upon removal of scaffolds.

4. All swept up debris, waste materials, and packing must be removed and placed in the dumpster by the end of the workday.

5. All stored material must be protected and kept in good order.

6. As portions of the work are completed, all used and excess materials must be removed promptly.

7. Daily Clean-up and good housekeeping is the responsibility of each contractor individually and will be monitored by the Construction Manager. If any contractor fails to perform cleaning when directed or does not properly clean within 4 hours of being notified by Construction Manager, the owner will hire others and charge contractor(s) accordingly.

8. Contractors shall promptly comply with requests to organize scattered materials.

D. Each Contractor is responsible for furnishing all dumpsters or other such containers as required for collection, storage and legal disposal of all debris and rubbish resultant from their construction operations. The Construction Manager shall locate and request to move such containers as necessary and legally dispose of waste as containers are filled. Separate and recycle as required authorities and regulations.

E. Vacuum clean areas when ready to receive finish painting, and continue vacuum cleaning on an as needed basis until building is ready for Substantial Completion or occupancy.

F. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.

G. Schedule cleaning operations so that dust and other containment resulting from cleaning process will not fall on wet, newly painted surfaces.

3.2 FINAL CLEANING

A. Each Contractor Shall:

1. Employ professional cleaners for final cleaning.

2. In preparation for substantial completion or occupancy, conduct final inspection of sight exposed interior and exterior surfaces, and of concealed spaces.

3. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials form sight-exposed interior and exterior finished surfaces; polish surface so designated to shine finish.

4. Maintain cleaning until project, or portion thereof, is occupied by owner.

5. Repair, patch and touch up marred surfaces to specified finish, to match adjacent surfaces.

6. If the contractor fails to perform final cleaning when directed or does not properly clean within 4 hours of being notified by Construction Manager, the owner will hire others and charge contractor accordingly.

B. General Contractor: shall complete the following restoration operations before requesting inspection for certification of Substantial Completion for entire Project or portion of Project:

1. Restoration of any lawn and walk/curb areas disturbed by construction operations. This includes repairs of any ruts / damage created by Heavy equipment, Lulls, cranes, etc.

2. Hire professional cleaning company (not construction tradesmen) to thoroughly clean all surfaces, including glass, floors, carpeting, ceramic tile, doors, windows, casework, etc.

3. Clean and wax Resilient floors using the exact same products / coats as the owner’s custodial staff for compatibility purposes. Vacuum all carpet areas

4. Power sweep all asphalt areas using a commercial street sweeper (water method)

5. Remove any stickers, protective coverings, etc.

6. Clean all materials & equipment etc. inside and out.

C. Mechanical Contractor: shall complete the following cleaning operations before requesting final inspection for certification of Substantial Completion for entire project or portion of project.

1. Clean all Mechanical units, including removal of any stickers, protective covering. Wipe down of all surfaces

2. Vacuum out all ductwork, grills / louvers to insure there is no construction debris or dust

3. Replace all air filters at no additional cost immediately prior to owner occupancy

D. Electrical Contractor: shall complete the following cleaning operations before requesting final inspection for certification of Substantial Completion for entire project or portion of project.

1. Clean surfaces of all electrical equipment from any dust. Remove any labels or protective films

2. Replace any burned out or non-functioning bulbs.

3.3 RUBBISH REMOVAL

A. Contractors shall comply with all Local, State and Federal Laws, Codes and Requirements regarding recycling and trash or rubbish removal.

END OF SECTION

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:
   1. Substantial Completion & Inspection procedures.
   2. Project record documents.
   3. Operation and maintenance manual submittal.
   4. Start-Up and adjustments
   5. Spare Parts.
   6. Demonstration & Training.

B. Closeout requirements for specific construction activities are included in the appropriate Sections.

C. Multiple Prime Contracts: Provisions of this Section apply to the construction activities of all prime contractors.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
   1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.
      a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
      b. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
   2. Advise the Owner of pending insurance changeover requirements.
   3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
   4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
   5. Submit record drawings, maintenance manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.

6. Deliver tools, spare parts, extra stock, and similar items.
7. Make final changeover of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems and instruction of the Owner's operation and maintenance personnel. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements. Start-up of existing removed/replaced rooftop HVAC units will include written confirmation from contractor’s mechanical subcontractor that all systems are adjusted and functioning properly.
9. Complete final cleanup requirements, including touchup painting.
10. Touch up and otherwise repair and restore marred, exposed finishes.

B. Initial Inspection: Conducted between Construction Manager and Contractor, once all incomplete items identified are completed, a request for review by the Architect shall be made.

C. Inspection Procedures: On receipt of a request for inspection, the Architect will either proceed with inspection or advise the Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
1. The Architect will repeat inspection when requested and assured that the Work is substantially complete. Note that multiple inspections due to contractor not being complete will result in a charge to the Owner in which the amount shall be deducted from said contractor via change order.
2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, endorsed and dated by the Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Architect.

4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion or when the Owner took possession of and assumed responsibility for corresponding elements of the Work.
5. Submit consent of surety to final payment.
6. Submit a final liquidated damages settlement statement.
7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
8. All items in the Construction Checklist must be received and approved prior to any retainage reduction.

B. Re-inspection Procedure: The Architect will re-inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Architect.

1. Upon completion of re-inspection, the Architect will prepare a certificate of final acceptance. If the Work is incomplete, the Architect will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance. Note that multiple inspections due to contractor not being complete will result in a charge to the Owner in which the amount shall be deducted from said contractor via change order.
2. If necessary, re-inspection will be repeated, but may be chargeable to the Owner and back-chargeable to the Contractor in conditions within his control.

1.5 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Construction Manager and Architect's reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.

3. Note related change-order numbers where applicable.
4. Organize record drawing sheets into manageable sets. Bind sets with durable- paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.

C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.
1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
3. Note related record drawing information and Product Data.
4. Upon completion of the Work, submit record Specifications to the Architect for the Owner's records.

D. Record Product Data: Maintain one copy of each Product Data submittal. Note related Change Orders and markup of record drawings and Specifications.
1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.
2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
3. Upon completion of markup, submit complete set of record Product Data to the Architect for the Owner's records.

E. Record Sample Submitted: Immediately prior to Substantial Completion, the Contractor shall meet with the Architect and the Owner's personnel at the Project Site to determine which Samples are to be transmitted to the Owner for record purposes. Comply with the Owner's instructions regarding delivery to the Owner's Sample storage area.

F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to the Architect for the Owner's records.

G. Maintenance Manuals: Organize operation and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual, heavy-duty, 2-3 inch, 3- ring, vinyl-

covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:

1. Emergency instructions.
2. Spare parts list.
3. Copies of warranties.
4. Wiring diagrams.
5. Recommended "turn-around" cycles.
6. Inspection procedures.
7. Shop Drawings and Product Data.
8. Fixture lamping schedule.

H. Waivers, guarantees, certification letters, AIA documents, etc.: See checklist attachment at the end of this section.

1.6 OPERATION AND MAINTENANCE DATA

A. CLOSEOUT SUBMITTALS

1. Manual Content: Submit manual content formatted and organized as required by this Section.
2. Format: Submit operations and maintenance manuals in the following format:
   a. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves.
3. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.
   a. Correct or revise each manual to comply with Architect's comments. Submit 3 copies of each corrected manual prior to commencing demonstration and training.
   b. Submit 3 copies of final manuals in electronic USB stick DVD format, as well.

B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information as described below.

a. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

b. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
   1. Standard maintenance instructions and bulletins.
   2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
   3. Identification and nomenclature of parts and components.
   4. List of items recommended to be stocked as spare parts.

c. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
   1. Test and inspection instructions.
   2. Troubleshooting guide.
   3. Precautions against improper maintenance.
   4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   5. Aligning, adjusting, and checking instructions.
   6. Service and lubrication requirements.
   7. Demonstration and training video recording, if available.

d. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

e. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

f. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

A. Include procedures to follow and required notifications for warranty claims.

1.7 STARTING AND ADJUSTING

A. Work of this Section also includes any contract document

stipulated man-hours that shall be provided by the prime contractors for startup participation of equipment and systems.

B. STARTING SYSTEMS
   1. The Contractor shall coordinate, schedule, and sequence the start-up of various equipment and systems.
   2. Where the start-up of a system or piece of equipment is dependent upon the start-up of other system(s) or equipment, then the Contractor shall schedule and sequence the start-ups to coincide.
   3. Notify the Architect at least 14 calendar days prior to the start-up of each item or system so that he can schedule the startup with the Owner and utilities.

C. Where applicable, verify that each piece of equipment or system has been checked for proper:
   1. lubrication
   2. drive rotation
   3. belt tension
   4. motor starter heater size
   5. fuse size
   6. water pressures
   7. terminal connections
   8. control sequence
   9. for conditions which may cause damage or delay the start-up procedure

D. Verify that the equipment has been installed in accordance with the manufacturer’s requirements.

E. Complete all pre-startup checklists that may be required by the system vendor.
   1. In the event that start-up activities are delayed as a result of the Contractor’s failure to properly check the completed installation and a manufacturer’s representative is on the job site waiting for corrections to be made, then the Architect may, at his/her sole discretion, postpone start-up until such time as the corrections have been made without any extra costs.
   2. The Owner may deduct from money due the Contractor the excess cost of engineering associated with having the Architect present during the start-up.
   3. The deduction shall be equal to the Architect’s effective billing rate times the total number of hours delayed during the start-up activities.

F. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment

or system manufacturer.

G. Verify that wiring and support components for equipment are complete and tested.

H. Execute start-up under supervision of applicable Contractor's personnel in accordance with manufacturer's instructions.

I. The Contractor shall have the job site superintendent present during all start-up activities.

J. Provide manufacturer's authorized technician at the site when specified and in accordance with the requirements contained in Section 014500 – Quality Control.

1.8 SPARE PARTS

A. QUALITY ASSURANCE

1. Spare parts shall be delivered as complete assemblies direct from the manufacturer such that the part is fully functional and ready to be installed.

B. DELIVERY, STORAGE AND HANDLING OF SPARE PARTS

1. Comply with the requirements of Section 016500 for packing, delivery, storage and handling requirements for all parts delivered to the site of the work.
2. All spare parts required to be furnished under a Section of the Specifications shall be packaged in one separate box, crate, or container with the words "SPARE PARTS" lettered on all sides of the container.
3. The equipment name or system name for which the spare parts are being pro- vided shall also be lettered on the container.
4. A separate packing list for the spare parts shall be included in the container.
5. The Contractor shall store all spare parts indoors immediately upon delivery of the spare parts to the site. Spare parts will not be accepted by the Owner/Architect if the spare parts have been stored outdoors for more than 8 hours upon delivery to the site.
6. The storage location shall be secure.

C. TURN OVER OF SPARE PARTS

1. Spare parts shall be turned over to the Owner/Engineer approximately two (2) weeks prior to the Architect's preparation of the Final Punch List.
    1. Spare parts will not be accepted until this time.
    2. The Certificate of Substantial Completion will not be issued until all spare parts are delivered.
2. The following procedure shall be followed:

1. The Contractor shall provide a formal letter of transmittal listing the name or description of the part, part number, model number, manufacturer (or supplier), and system component name and the Section where it was specified to be provided.

1.9 CLOSEOUT PROCEDURES

A. Operation and Maintenance Instructions: Arrange for each Installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. Provide instruction by manufacturer's representatives if installers are not experienced in operation and maintenance procedures. Include a detailed review of the following items:
   1. Maintenance manuals.
   2. Record documents.
   3. Spare parts and materials.
   4. Tools.
   5. Lubricants.
   6. Fuels.
   7. Identification systems.
   8. Control sequences.
   9. Hazards.
   10. Cleaning.
   11. Warranties and bonds.
   12. Maintenance agreements and similar continuing commitments.

B. As part of instruction for operating equipment, demonstrate the following procedures:
   1. Startup.
   2. Shutdown.
   3. Emergency operations.
   4. Noise and vibration adjustments.
   5. Safety procedures.
   6. Economy and efficiency adjustments.
   7. Effective energy utilization.

C. Record "As-Built" Drawings
   1. Upon completion of the work, and review of the record drawings by the Architect, prepare a final set of record drawings using reproducible mylar or vellum. Submit final set of transparencies to Construction Manager and Architect. Contractor will also provide 3 ea. electronic copies of all as-builts on disk.
   2. The cost of furnishing above prints and preparing these record drawings shall be included in the contract price.

1.10 CLOSEOUT SUBMITTALS

A. See attached checklist for required wage & supplements, lien

releases, guarantee/warranties, etc.

1.11 DEMONSTRATION AND TRAINING

A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system. Include a detailed review of the following:

1. Include instruction for basis of system design and operational requirements, review of documentation, emergency procedures, operations, adjustments, troubleshooting, maintenance, and repairs.
2. The entire training session will be video – recorded by the contractor and the owner provided with 3 copies of the training USB.

1.12 CLOSEOUT CHECKLIST

A. See attached checklist for required wage & supplements, lien release, guarantee / warranties, etc. No retainage reductions will be considered by the owner until receipt and approval of all closeout paperwork.

END OF SECTION

1 77 01 – CHECKLIST FOR PROJECT CLOSEOUT AND PROCESSING OF FINAL PAYMENT

PART 1 – GENERAL

1.1 Final payment will not be processed until all items indicated are received in accordance with Section 017701 – Checklist for Project Closeout.

1.2 Close-out Submittals:

[ ] Three (3) bound, hard cover, 3-ring binder brochures of Operation and Maintenance Manuals for all equipment installed on the project (1 additional electronic copy):

[ ] Typed or printed instructions covering the care and operations of equipment and systems furnished and installed.

[ ] Manufacturers instruction books, diagrams, spare parts lists covering all equipment.

[ ] Instruction of Owner's Representative in care and maintenance of new equipment.

[ ] All approved shop drawings.

[ ] Certificates of compliance and inspection. (Where applicable – electric, elevator, etc.)

[ ] Spare parts and Maintenance Materials.(Receipt signed by ACCI & Owner)

[ ] Evidence of compliance with requirements of governing authorities (Certificates of Inspection, Waste Manifests).

[ ] Certificates of insurance for products and completed operations.

[ ] Notarized statement that only non-asbestos materials were installed on this project.

[ ] Fully executed certificate of substantial completion: AIA G704.

[ ] Contractor's written one-year warranty and extended warranties (if any required). [ ] Project Record Documents.

[ ] As-Built Drawings (1 full-size hard copy and 1 electronic copy).

1.3 Evidence of Payments and Release of Liens:

[ ] Contractor's Affidavit of Payment of Debts and Claims: AIA G706. [ ] Contractor's Affidavit of Release of Liens: AIA G706A with:

[ ] Separate AIA G706A for subcontractors, suppliers, and others with lien rights against the property of owner, together with a list of those parties.

[ ] Consent of Surety to Final Payment: AIA G707.

Retainage reduction will not be considered until all items indicated on the above checklist are received in accordance with Section 017700 – Closeout Procedures.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01 77 02 – CONFORMED CONSTRUCTION DOCUMENTS (AS-BUILTS)

PART 1 - GENERAL

1.01 GENERAL:

A. Submit Conformed Construction Documents as required by Section 01700 herein specified and obtain written receipt from Architect.

B. Each prime contractor shall, upon completion of the construction work, furnish the Owner with three (3) paper sets and two (2) electronic copies (PDF acceptable) of Conformed Construction Documents.

1. The Contractor shall either use and reproduce the documents they are entitled to via the contract or they shall request and pay for additional sets from the Architect.

a. Electronic drawing files, AutoCAD format, may be available, at the discretion of the Architect, for a cost of $25.00 per drawing. Contractors requesting this service will be required to sign a disclaimer. Request for electronic files must be made in writing to the Architects office. This request must include a specific list of drawings required in this format. In response, the architect will verify the drawings requested and will forward the disclaimer for signature. Electronic files will be released upon receipt of payment and a fully executed disclaimer.

2. Incorporate all changes due to addenda modifications, change orders, field conditions and record actual locations of all items clearly and neatly. Submit prints when requested by the Architect for interim approval. Review may be made periodically during the job.

C. The Architect will review Conformed Construction Documents prior to transmittal to Owner. If in the Architect’s opinion, the submitted Conformed Construction Documents are lacking or inadequate, the Contractor shall revise and resubmit accordingly.

1.02 BUILDING CONSTRUCTION AND RECONSTRUCTION:

A. General Construction:

1. Incorporate plan changes, structural changes, and general building layout changes. For buried construction, include tie dimensions.

B. Mechanical Construction:

1. Incorporate ductwork and revisions/re-routing, registers and

diffusers, piping runs, valve locations and identification, pump locations and identification, and equipment location. For buried construction, include tie dimensions.

C. Electrical Construction:

1. Incorporate large conduit runs, switchgear and panel locations, equipment locations, and controls locations. For buried construction, include tie dimensions.

D. Plumbing Construction:

1. Incorporate above ground and underground piping runs, clean-outs, and valve locations and identification. For buried construction, include tie dimensions.

1.03 SITE WORK:

A. Parking Lot, Pavement, Fields and General Site Construction:

1. Provide a survey, signed and sealed by NYS licensed Land Surveyor. Mark-ups of the Construction Documents will not be accepted unless agreed to in advance by the Architect for small-scope projects only.

a. If a land survey of existing conditions is provided in the Construction Documents, the contractor shall update that land survey as the basis of the as-built, utilizing the surveyor that performed said original survey.

2. Incorporate layout changes, drainage structure locations, piping locations, invert elevations, fences, and topography.

a. If site work is relevant to a new building or building addition, provide actual finish floor elevations at all doorways, and actual building perimeter locations and dimensions.

B. Utility Service Construction:

1. Provide a survey, signed and sealed by NYS licensed Land Surveyor. Mark-ups of the Construction Documents will not be accepted unless agreed to in advance by the Architect for small-scope projects only.

a. If a land survey of existing conditions is provided in the Construction Documents, the contractor shall update that land survey as the basis of the as-built, utilizing the surveyor that performed said original survey.

2. Incorporate layout changes, electrical primaries and secondaries, transformers, water services, gas services, sewer lines, and sanitary systems with leaching structure locations, piping locations, and invert elevations.

a. Include tie dimensions to visible above ground elements for buried construction.

END OF SECTION

SECTION 01 78 36 – WARRANTIES

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.
   1. Refer to the General Conditions for terms of the Contractor's period for correction of the Work.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 1 Section "Submittals" specifies procedures for submitting warranties.
   2. Division 1 Section "Closeout Procedures" specifies contract closeout procedures.
   3. Divisions 3 through 33 Sections for specific requirements for warranties on products and installations specified to be warranted.
   4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.

C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

D. Separate Prime Contracts: Each prime contractor is responsible for warranties related to its own contract.

1.2 DEFINITIONS

A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.3 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement.

   The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

D. Owner's Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.

   1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

E. Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, the Owner reserves the right to refuse to accept the Work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

1.4 SUBMITTALS

A. Submit written warranties to the Architect and Construction Manager prior to the date certified for Substantial Completion. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the architect.

1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect and Construction Manager within 15 days of completion of that designated portion of the Work.

B. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner, through the Architect and Construction Manager, for approval prior to final execution.
   1. Refer to Divisions 3 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Form of Submittal: At Final Completion compile 2 copies of each required warranty properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. **Warranties must be job-specific from the manufacturer and reference this project.** Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

D. Bind warranties in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose- leaf binders, thickness as necessary to accommodate contents, and sized to receive 8- 1/2-by-11-inch (115-by-280-mm) paper.
   1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the Installer.
   2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project title or name, and name of the Contractor. Three hardcopy binders required, and 2 electronic copies in owner preferred format.
   3. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

DIVISION 1A - GENERAL REQUIREMENTS

SECTION 01 61 50 – PROJECT DECONTAMINATION

PART 1 – GENERAL

1.01 DESCRIPTION

A. Following completion of the asbestos-control work, polyethylene sheeting on walls, then the floor cover, shall be carefully removed, folded to minimize dispersal of asbestos-containing residue and debris, and packed properly in caution-marked double ply plastic bags 3 mil minimum thickness each ply. Bags shall be sealed and placed in fiber or metal drums, covered and sealed for transport. The outside of all drums shall be cleaned before leaving the work area.

1. Vertical sheeting which forms the sole barrier between the work area and occupied area shall remain in place.

2. Double barriers at entrances to the work area shall remain in place.

3. Sheeting over lighting fixtures and clocks, ventilation openings, and occupied area shall remain in place.

B. Clean all surfaces of the work area including remaining sheeting, tools, scaffolding and/or staging by use of a High Efficiency Particulate Absolute (HEPA) filter vacuum (Note: A HEPA Vacuum will fail if used with wet material). Dry dusting or dry sweeping shall not be permitted. Once vacuuming is complete, all surfaces shall be washed. Cleaning cloths and mopheads shall be rinsed periodically to avoid spreading of asbestos fibers.

C. Following the first cleaning and prior to the first sheeting removal, apply a thin coat of encapsulating agent on non-removed surfaces only. Then carefully remove sheeting over lighting fixtures and clocks and dispose of as indicated above.

D. After the area has been allowed to settle for a minimum of twelve (12) hours, perform a second cleaning. Following completion of the second damp-cleaning operation, perform a complete visual inspection of the work area (all surfaces, including beams, ledges, and folds of polyethylene sheeting) to insure that the area is dust free. If any residue is visible after the second cleaning, affected surfaces shall be damp-cleaned again.

E. Then perform a third cleaning after an additional twelve (12) hour period has elapsed.

F. Air samples shall be taken in each work area (see Section 02082) for air monitoring and testing.

G. If the work area is found to be still contaminated, i.e. if these test results exceed any reading for outside air taken pursuant to Section 02082, repeat the damp-cleaning, air monitoring, and testing.

H. After the work area is found to be decontaminated, and upon approval of the Project Monitor, remaining polyethylene sheeting shall be carefully removed, folded, and disposed of as indicated above.

1.02 DECONTAMINATION

A. The Contractor shall provide an adequate decontamination unit consisting of a serial arrangement of rooms or spaces adjoining the Work Area as indicated on plans or a decontamination trailer meeting the criteria outlined below. Each space shall be clearly identified and separated from the others by plastic sheet doors, acceptable air locks minimum 3' wide designed to minimize fiber and air transfer as people pass between areas. Air locks shall have at least three layers of 6-mil plastic sheetings.

B. The decontamination areas are described below:

1. Clean Room: In this room, persons remove and leave all street clothes and put on clean, disposable coveralls. Approved respiratory protection equipment is also picked up in this area. Sheeting for this area to be 6-mil opague for walls and double layer floor. NO ASBESTOS CONTAMINATED ITEMS ARE PERMITTED IN THIS ROOM.

2. Shower Room: This is a separate room used for transit by cleanly dressed people entering the job site from the Clean Room and for showering by them after they have undressed in the Equipment Room. Hot and cold water adjustable at the tap is required. THIS IS A CONTAMINATED AREA.

3. Equipment Room: Work equipment, footwear and all other contaminated work clothing shall be stored here. This is also a change and transit room for people. All areas between the Shower Room and Work Area shall be considered part of the Equipment Room. Double layer plastic floor and wall covering is required. A walk off water pan for cleaning footwear is required. THIS IS A CONTAMINATED AREA.

1.03 SAFETY

Workers and visitors shall observe the following Work Area entry and exit procedures:

A. WORKER ENTERS CLEAN ROOM AND REMOVES STREET CLOTHING, PUTS ON CLEAN OVERALLS AND RESPIRATOR, AND PASSES THROUGH SHOWER ROOM INTO THE EQUIPMENT ROOM.

B. ANY ADDITIONAL REQURIED CLOTHING AND EQUIPMENT PREVIOUSLY DEPOSITED IN THE EQUIPMENT ROOM IS PUT ON (WHEN WORK AREA IS TOO COLD FOR COVERALLS ONLY, THE WORKER WILL USUALLY PROVIDE HIMSELF/HERSELF WITH ADDITIONAL WARM GARMENTS TO BE WORN UNDER THE DISPOSABLE CLOTHING. THESE MUST BE TREATED AS CONTAMINATED CLOTHING AND LEFT IN THE DECONTAMINATION UNIT). UNDER NO CIRCUMSTANCES SHALL A WORKER ENTER THE WORK AREA WITHOUT HAVING PROTECTIVE CLOTHING ON.

C. WORKERS PROCEED TO WORK AREA AND PERFORM WHATEVER WORK IS TO BE DONE.

D. BEFORE LEAVING THE WORK AREA, THE WORKER SHALL REMOVE ALL GROSS CONTAMINATION AND DEBRIS FROM THE COVERALLS USING A VACUUM WITH A HIGH EFFICIENCY PARTICULATE ABSOLUTE (HEPA) FILTER. IN PRACTICE, THIS IS USUALLY CARRIED OUT BY ONE WORKER ASSISTING ANOTHER.

E. THE WORKER PROCEEDS TO EQUIPMENT ROOM AND REMOVES ALL CLOTHING EXCEPT APPROVED RESPIRATORS. EXTRA WORK CLOTHING MAY BE STORED IN CONTAMINATED END OF THE UNIT. DISPOSABLE COVERALLS ARE PLACED IN A BAG FOR DISPOSAL WITH OTHER MATERIAL.

F. THE WORKER THEN PROCEEDS DIRECTLY INTO THE SHOWER ROOM. RESPIRATORS SHALL BE TAKEN OFF LAST TO PREVENT INHALATION OF FIBERS DURING REMOVAL OF CONTAMINATED CLOTHING AND SHALL NOT BE REMOVED UNTIL THEY HAVE BEEN WASHED FREE OF DUST.

G. AFTER SHOWERING, THE WORKER MOVES TO THE CLEAN ROOM AND DRESSES IN STREET CLOTHING PRIOR TO EXITING.

H. RESPIRATORS ARE PICKED UP, WASHED THOROUGHLY AND DISINFECTED AS REQUIRED BY OSHA REGULATIONS 29 CFR 1910.134, AND 1926, AND WRAPPED AND STORED IN THE CLEAN ROOM.

I. All filters in the air handling system(s) shall be carefully removed, treating as contaminated material, bagged, and disposed of as indicated above.

J. Filters in dual cartridge type respirators used during the preparation phase of the job shall be removed, wetted and discarded as contaminated waste. A new filter shall be in place in the respirator prior to re-use. For powered air purifying respirators or supplied air respirators, the manufacturer shall be consulted about the proper decontamination sequence.

K. There shall be no smoking, eating or drinking in any contaminated areas (shower room, equipment room and work area). Respirators shall be worn in all contaminated areas. Failure to observe these requirements will result in the ejection of the offender from the premises. Failure of the offender to leave will result in a written stop work order.

L. Work footwear, i.e., non-disposable, shall remain inside the contaminated area until completion of the job and shall be thoroughly cleaned at that time.

M. It shall be the contractor’s responsibility to ensure all employees follow the appropriate procedures, including the decontamination procedures listed. Employees who repeatedly violate proper procedures shall be subject to disciplinary measures by the contractor, including dismissal if necessary.

N. Three final cleanings will be performed prior to clearance air monitoring and lock down. Each cleaning shall be at a minimum of twelve hours apart to allow for drying time.

O. Post abatement visual inspections shall be conducted by the Project Monitor prior to all cleanings and lockdown. All surfaces in the work area shall be encapsulated, not just abated surfaces. However, any cosmetic surfaces such as painted or finished surfaces shall have three layers of polyethylene applied and a fourth cleaning shall be done on the cosmetic surface to eliminate defacing of the surface due to lock down.

P. After completion of the cleaning operation the contractor shall:

1. Notify the Asbestos Safety Monitor that a POST removal clean-up inspection can be performed to ensure all visible asbestos has been removed and the area is dust free. The owner's testing firms will conduct an aggressive visual inspection of all work areas. In addition to a visual inspection conducted at the floor level, the owner's testing firm shall inspect all exposed surfaces in the work areas, including those at the ceiling level (using ladder as necessary), to ensure that no visible asbestos-containing materials have been left above ceilings, structural members or on light fixtures or other surfaces. The contractor must provide the ladders or scaffolding necessary to inspect these areas and sufficient electrical sources, location and number to conduct air sampling.

2. Request air monitoring of the work area by the Owner's testing firm within 48 hours. This testing shall be done using NIOSH Method 7400 by a credentialed laboratory. The Owner's testing firm will then conduct overall area monitoring under simulated conditions of normal building occupancy. Fans with a radius of one foot and capable of creating a minimum air velocity of 500 ft per minute shall be used in each room to be monitored to stir up any residual invisible fibers such as would be entrained in air by the pedestrian traffic under conditions of normal occupancy. Asbestos fiber concentrations shall not exceed 0.01 f/cc. Final air monitoring clearance testing will not be taken if any of the surfaces in the work area are wet.

END OF SECTION

DIVISION 1A - GENERAL REQUIREMENTS

SECTION 01 61 60 – CLEAN-UP PROCEDURES

PART 1 – GENERAL

1.01 CLEAN-UP

The following clean-up procedures shall be required for all large and small abatement projects:

A. Frequency for containerizing: Cleanup of accumulations of loose asbestos material shall be performed whenever enough loose asbestos material has been removed to fill a single leak tight container of the type commensurate with the material properties. In no case shall cleanup be performed less than once prior to the close of each working day. Asbestos material shall be kept wet until cleaned up.

B. Frequency of dust: Accumulations of dust shall be cleaned off all surfaces on a daily basis using HEPA VACUUM and/or wet cleaning methods.

C. Frequency for enclosures: Decontamination enclosures shall be HEPA vacuumed and/or wet cleaned at the end of each shift.

D. Clean-up tools and equipment: Accumulations of asbestos waste material shall be containerized utilizing HEPA vacuums or rubber or plastic dustpans, squeegees or shovels. Metal shovels shall not be used to pick up or move waste.

1.02 POST ABATEMENT REQUIREMENTS

A. The following clean-up procedure shall be required after completion of all abatement activities:

1. Clean-up tools and equipment: All accumulations of asbestos waste material shall be containerized utilizing HEPA vacuums or rubber or plastic dust pans, squeegees or shovels. Metal shovels shall not be used to pick up or move waste. HEPA vacuums shall be used to clean all surfaces after gross cleanup.

2. First Cleaning: All surfaces in the work area shall be first wet cleaned using rags, mops and sponges. To pick up excess liquid and wet debris, a wet purpose shop vacuum may be used and shall be decontaminated prior to removal from the work area.

3. First Sheeting Removal: The cleaned, exposed barrier layer of plastic sheeting shall be removed from walls and floors. Windows, doors, HVAC system vents and all other openings shall remain sealed. Decontamination enclosure systems shall remain in place and be utilized.

4. Second Cleaning and Sheeting Removal: After the first cleaning, at least twelve hours shall be allowed for asbestos to settle. Thereafter all objects and surfaces in the work area shall be HEPA vacuumed and/or wet cleaned. The remaining plastic on walls and floors only shall then be removed. All windows, doors, HVAC system vents and all other openings shall remain sealed.

5. Third Cleaning: After the second cleaning, at least twelve hours shall elapse before HEPA vacuuming and/or cleaning all surfaces in the work area. The negative pressure ventilation units shall remain in continuous operation during the settling periods and third cleaning.

6. Removal of Waste: All containerized waste shall be removed form the work area and the holding area.

7. Removal of Tools and Equipment: All tools and equipment shall be removed from the work area and decontaminated.

8. Clearance Air Monitoring: Clearance air monitoring is to be conducted by Owner's Laboratory.

9. Removal of Isolation Barriers: The isolation barriers shall be removed only after satisfactory clearance air monitoring results have been achieved.

1.03 FINAL CLEAN-UP

A. All critical barriers shall be unsealed.

B. Plastic sheeting, tape and any other debris shall be disposed of in sealed plastic bags labeled as asbestos contaminated waste.

C. The inside of windows shall be washed.

D. Any walls, floors, trim, doors, furniture or other items damaged during the work shall be repaired and refinished to match existing material.

E. Woodwork, trim, floor, furniture, plumbing and electric light fixtures shall be cleaned.

F. Cloths or sponges used in the cleaning operation shall be disposed of as contaminated waste.

G. There shall be no residue left on floors, ceilings, electric light fixtures or other surfaces.

END OF SECTION

DIVISION 1A - GENERAL REQUIREMENTS

SECTION 01 61 70 – MONITORING & SUPERVISION

PART 1 – GENERAL

1.01 DESCRIPTION

The specifications of this section are provided ***as information only*** to the Asbestos Removal Contractor.

A. All work herein described shall be performed as one single contract responsible to the Owner and shall include the services of both an Asbestos Safety Control Monitor and Asbestos Safety Technician. This work shall be in addition to, and independent of the OSHA mandated air monitoring conducted on behalf of the contractor's employees. Testing Laboratory shall be from the approved list of firms published by the New York State Health Department.

1.02 GENERAL DUTIES

A. The Asbestos Safety Technician shall perform all air sampling specified herein, and shall be thoroughly familiar with the Asbestos Removal Specifications. Acting on behalf of the Owner, he shall have access to all areas of the Asbestos Removal project at all times and shall randomly inspect and monitor the performance of the Contractor to verify that said performance meets all Federal and State Regulations and is in compliance with the Asbestos Removal Specifications. The Asbestos Safety Technician may be on site throughout the entire abatement operation.

1.03. AUTHORITY AND COMPLIANCE RESPONSIBILITIES

A. The Asbestos Safety Technician shall have the authority to direct the actions of the Contractor verbally, and in writing to assure compliance. In the event of continual non-compliance or serious violation, the Asbestos Safety Technician shall notify the Owner, the Architect/Engineer and, as necessary, appropriate governmental agencies. The Asbestos Safety Technician shall issue a written "Stop Work" order to the contractor if so directed by the Owner, the Owner's Architect/Engineer or an appropriate governmental agency. All directions to the contractor shall be legible, dated, and shall bear the signature of the Asbestos Safety Technician. Copies shall be forwarded to the Owner and Architect/Engineer.

1.04 REPORTING OF AIR SAMPLING AND ANALYSIS DATA

A. The Testing Laboratory shall conduct all required analysis within the time frame specified and in conformance with specified analytical procedures and shall report the results of such tests to the Asbestos Safety Technician. The Asbestos Safety Technician, upon receipt of testing results indicating that concentrations above 0.01 fiber/cc have occurred outside the containment barriers or within the clean room of the decontamination chamber during the abatement action shall report these results within one working day verbally or by telephone communication if necessary to the Contractor, the Owner and the A/E, so that prompt corrective action may be taken.

This telephonic or verbal communication shall be followed by a written report. A copy of which shall be sent to the administrative authority having jurisdiction.

B. The Asbestos Safety Technician shall keep a daily log of on-site observations concerning Contractor's compliance with activities required under the job specifications, listing all deficiencies encountered and the names of all persons entering the work area. This log shall be made available upon request at all times to the Owner, the Architect/Engineer and to appropriate Local, State and Federal Agencies. The Asbestos Safety Technician shall report results in a comprehensive final report, including daily logs, required inspection reports, observations and air monitoring results. The Asbestos Control Monitor shall maintain the report as a permanent record and present a copy to the Owner within twenty (20) working days.

1.05 PRE-TESTING

A. Prior to the initial preparation for asbestos removal (i.e., before construction of barriers, masking and sealing, test(s) shall be conducted under normal building occupancy conditions in order to establish base line air quality data for future reference. If pre-test(s) have not already been performed, the Asbestos Safety Technician shall conduct the pre-test(s).

1. Conditions during sampling: Whenever possible, sampling shall be conducted during conditions of normal use occupancy. If an observer cannot be present to ensure the integrity of each sample while building is occupied, then the Air Testing Technician shall return when the building is not occupied to perform monitoring under conditions of simulated normal use occupancy. The aspect of normal use activity that is important to recreate during simulation is the re-entrainment in air fibers which, may have settled out onto horizontal surfaces. To this end, when the building is not occupied, the Asbestos Safety Inspector shall supply and place propeller type fans in the space. The fan shall have blades with a radius of at least one foot and shall be capable of creating a minimum air velocity of 500 ft per minute. These may be of the oscillating type. The sampling pump and sampling media shall be placed 20-40 ft at a right angle from the line(s) of airflow created in front of the fan.

2. Sampling Procedure: Filter cassettes and sampling train shall be assembled as specified in NIOSH Method #7400. The flow rate shall be between 2.0 and 10 liters per minute. The total volume shall be of sufficient quantity to guaranty 0.005 fibers/cc level of reliable quantitation. Pumps shall be calibrated before and after sampling and a record kept of each calibration. At least five samples per homogenous sampling area shall be collected with on additional for every 5,000 sq.ft. greater than 25,000 sq.ft.

3. Analysis: NIOSH Method #7400.

4. Maximum turn-around time: 2 working days.

5. Evaluation Criterion: 0.01 f/cc.

6. The Asbestos Safety Technician shall perform all air sampling specified in this sub-chapter, and shall be thoroughly familiar with applicable regulations. He shall have access to all areas of the asbestos removal project at all times and shall inspect and monitor the performance of the Contractor to verify that said performance complies with these specifications.

7. The Asbestos Safety Technician shall have the authority to direct the actions of the contractor verbally and in writing to assure compliance. In the event of continual non-compliance or serious violation the Asbestos Safety Technician shall notify the Inspector from the Administrative Laboratory having jurisdiction who shall issue a written Stop Work Order to the Contractor and have the work site secured until all violations are resolved.

8. The Asbestos Safety Technician upon receipt of testing results indicating that concentrations above 0.01 fibers/cc have occurred outside the containment barriers or above .0.2 f/cc within the clean room of the decontamination chamber during the abatement action shall report these results within one working day verbally or by telephone communication if necessary to the Contractor, the owner and the architect/engineer so that prompt corrective action may be taken. This telephone or verbal communication shall be followed by a written report.

1.06 REMOVAL

A. Monitoring outside the work area shall be provided throughout removal to ensure that no outside contamination is occurring.

B. Filter cassettes and sampling train shall be assembled as specified in NIOSH #7400. The flow rate shall be between 2.0 and 10 liters per minute. The total volume shall be sufficient to achieve a detection limit of 0.01 f/cc. Pumps shall be calibrated before and after sampling and a record kept of this calibration.

C. Three samples per day shall be provided. One stationary sample at decontamination unit entrance/exit and two samples adjacent to work area, but remote from the decontamination unit entrance. In the selection of adjacent areas to be monitored, preference shall be given to rooms which may remain occupied by unprotected personnel.

D. If the Contractor’s barriers or other control methods are observed to malfunction and if the Contractor does not correct the problems immediately upon notifications, then the work stoppage procedures shall be followed. In such a situation, additional sampling up to three samples per day, shall be performed by the Asbestos Safety Technician.

E. Analysis: NIOSH Method #7400.

F. Maximum turn-around time: two working days.

G. The evaluation criteria: 0.01 f/cc.

H. Series of smoke tests shall be performed at the decontamination unit entrance/exit, by the Asbestos Safety Technician to ensure continuous negative air pressure. This test shall be performed before each work shift and every four hours thereafter until work stops.

1.07 POST REMOVAL TEST

A. The Asbestos Safety Technician shall provide monitoring of work area (s) within 48 hours of final cleaning and before removal of critical barriers. This test is required to establish safe conditions for removal of critical barriers and to permit reconstruction activity to begin. Sufficient time following clean-up activities shall be allowed so that all surfaces are dry during monitoring.

1. Conditions During Sampling: Normal occupancy use conditions shall be simulated using fans. The Asbestos Safety Technician shall supply and place propeller-type fans in each room to be sampled so as to cause settled fibers to rise and enter the air. The fans shall have blades with a radius of at least 20" and shall be capable of creating a minimum air velocity of 500 ft. per minute. The sampling pump and sampling media shall be placed 20-40 ft. at a right angle from the line(s) of air flow created in front of the fan. Negative air equipment must operate so as not to exceed 2 air changes per minute.

2. Sampling Procedure: Filter cassettes and sampling train shall be assembled as specified in NIOSH #7400. The flow rate shall be between 2.0 and 10 liters per minute. The total volume shall be of sufficient quantity to guaranty 0.005 fibers/cc level of reliable quantitation. Pumps shall be calibrated before and after sampling and a record kept of this calibration.

3. Sampling Frequency and Location: Take a minimum of five samples per homogenous abatement area plus one for each 5,000 sq. ft. greater than 25,000 sq.ft.

4. Analysis: NIOSH Method #7400.

5. Time for Laboratory Analysis: Maximum turn-around time upon completion of sample is thirty six (36) hours.

6. Evaluation Criteria: If any test results exceed 0.01 fiber/cc the Asbestos Safety Technician shall so inform the Contractor, the Owner and the Architect/Engineer.

7. Final Clearance: Air Testing shall be in accordance with A.H.E.R.A. interim methodology as prescribed in EPA Regulation 40 CFR Part 763 (Transmission electron Microscopy).

B. The Contractor shall be required to re-clean all surfaces using wet cleaning methods and provide negative HEPA filtered exhaust air during the re-cleaning process. This process of re-cleaning, allowing surfaces to dry, and re-testing shall be repeated until compliance is achieved.

END OF SECTION

DIVISION 1A - GENERAL REQUIREMENTS

SECTION 01 61 80 - REMOVAL OF ASBESTOS CONTAMINATED SUBSTRATE MATERIAL – MANUAL SCRAPE METHOD

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z9.2	(1979; R 1991) Fundamentals Governing the Design and Operation of Local Exhaust Systems
ANSI Z87.1	(1989; Errata; Z87.1a) Occupational and Educational Eye and Face Protection
ANSI Z88.2	(1992) Respiratory Protection

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 732	(1982; R 1987) Aging Effects of Artificial Weathering on Latex Sealants
ASTM D 522	(1993a) Mandrel Bend Test of Attached Organic Coatings
ASTM D 1331	(1989) Surface and Inter facial Tension of Solutions of Surface-Active Agents
ASTM D 2794	(1993) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D 4397	(1991) Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
ASTM E 84	(1991a) Surface Burning Characteristics of Building Materials
ASTM E 96	(1993) Water Vapor Transmission of Materials
ASTM E 119	(1988) Fire Tests of Building Construction and Materials
ASTM E 736	(1992) Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
ASTM E 1368	(1990) Visual Inspection of Asbestos Abatement Projects

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR 761	Polychlorinated Biphenyls (PCBs)
40 CFR 763	Asbestos Hazard Emergency Response Act (AHERA)

COMPRESSED GAS ASSOCIATION (CGA)

CGA G-7	(1990) Compressed Air for Human Respiration
CGA G-7.1	(1989) Commodity Specification for Air

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 340/1-90-018	(1990) Asbestos/NESHAP Regulated Asbestos-Containing Materials Guidance
EPA 340/1-90-019	(1990) Asbestos/NESHAP Adequately Wet Guidance
EPA 560/5-85-024	(1985) Guidance for Controlling Asbestos-Containing Materials in Buildings

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(1990) Portable Fire Extinguishers
NFPA 70	(1993) National Electrical Code
NFPA 90A	(1993) Installation of Air Conditioning and Ventilating Systems
NFPA 101	(1994) Safety to Life from Fire in Buildings and Structures
NFPA 701	(1989) Methods of Fire Test for Flame-Resistant Textiles and Films

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH Pub No. 84-100	(1984; Supple 1985, 1987, 1988 & 1990) NIOSH Manual of Analytical Methods

UNDERWRITERS LABORATORIES (UL)

UL 586 (1990) High Efficiency, Particulate, Air Filter Units

NEW YORK STATE

12 NYCRR Part 56	New York State Department of Labor (revised January 11, 2006)
6 NYCRR Part 364	New York State Department of Environmental Conservation, Waste Collector Registration
6 NYCRR Parts 370	New York State Department of Environmental Conservation through 374-3 and 376

1.2 DEFINITIONS

1.2.1 "Adequately Wet"

A term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-019 that means to sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material (ACM), then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wetted.

1.2.2 "Amended Water"

Water containing a wetting agent or surfactant with a surface tension of at least 29 dynes per square centimeter when tested in accordance with ASTM D 1331.

1.2.3 "Friable ACM"

A term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 that means any material containing more than 1 percent asbestos as determined using the method specified in 40 CFR 763, Appendix A, Subpart F, Section 1, Polarized Light Microscopy, that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. If the asbestos content is less than 10 percent as determined by a method other than point counting by polarized light microscopy (PLM), verify the asbestos content by point counting using PLM.

1.2.4 "Non friable ACM"

A term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 that means any material containing more than 1 percent asbestos as determined using the method specified in 40 CFR 763, Appendix A, Subpart F, Section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.

1.2.5 "Category I Non friable ACM"

A term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 that means asbestos-containing packings, gaskets, resilient floor

covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in 40 CFR 763, Appendix A, Subpart F, Section 1, Polarized Light Microscopy.

1.2.6 "Category II Non friable ACM"

A term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 that means any material, excluding Category I non friable ACM, containing more than 1 percent asbestos as determined using the methods specified in Appendix A, Subpart F, 40 CFR 763, Section 1, Polarized Light Microscopy, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

1.2.7 "Asbestos Regulated Work Area"

An asbestos regulated work area is an area contained and controlled either by an enclosed containment (full containment area, single or double bulkhead containment area, mini-containment area), modified containment glove bag or outdoor techniques, where asbestos containing materials (ACM) operations are performed and isolated by physical boundaries to prevent the spread of ACM and control access to authorized persons. A full containment, single or double bulkhead containment area, mini-containment area, modified containment, and glove bag work area is isolated within a containment enclosure in which ACM operations are performed. An outdoor regulated work area is not isolated within a containment enclosure, but is otherwise secured by means of physical barriers, boundary warning tape, and signs, etc., to control access by unauthorized persons.

1.2.8 "Time-Weighted Average (TWA)"

The TWA is an 8-hour time weighted average of airborne concentration of fibers (longer than 5 micrometers) per cubic centimeter of air which represents the employee's 8-hour workday as determined by Appendix A of 29 CFR 1926, Section 1926.1101.

1.3 DESCRIPTION OF WORK

1.3.1 WORK INCLUDED

A. The work covered by this section includes the handling of Category I Non friable asbestos-containing materials, and Category II non-friable asbestos-containing materials (ACM) that are encountered at this project. This section describes procedures and equipment required to protect workers and occupants of the work area from contact with airborne asbestos fibers and ACM dust and debris. The work also includes the disposal of the generated ACM wastes.

B. This abatement work is governed by 29 CFR 1926.1101 (Asbestos), 40 CFR 763

C. (AHERA), 40 CFR 61 Subpart M (NESHAPS), and 12 NYCRR Part 56 (New York State Department of Labor Industrial Code Rule 56), and other regulations as listed in Section 1.1 of this Specification.

D. The Contractor shall furnish all labor, materials, training, services, fees, equipment, and insurance necessary to carry out the removal and disposal of asbestos containing materials (ACM), and hazardous materials described below.

E. Contractor shall coordinate all work with the Owner, Construction Manager, Asbestos Project Monitor, General Contractor, Flooring Contractor, Electrical Contractor, Mechanical Contractor, Plumbing Contractor, Window/Door Contractor, Roofing Contractor, and any other entity as necessary.

F. The work is to be phased by zones. Zones are to be isolated from other building areas by hard wall barriers. Place zone partitions to allow at least two exits from each zone.

G. Protect all furnishings and equipment to remain.

H. All ACM locations are descriptive and/or diagrammatic. All measurements and quantities are approximate. Exact locations and quantities should be field verified by the Contractor.

I. The project involves removal in multiple work areas. Personnel and waste decontamination units, sized for a large project, are required. The decontamination units shall be contiguous with the work areas. Remote decontamination units may be used where allowed.

J. Non-ACM building materials may be decontaminated and disposed as construction debris.

K. The Contractor shall file applications for all necessary permits as required by all administrative authorities and enforcing agencies. The Contractor is required to fulfill any format necessary as well as to pay all required fees.

L. The Contractor is responsible to secure required variances.

M. Critical barriers, wet methods, HEPA vacuum equipment, HEPA negative air filtration, decontamination units, and personal protective equipment are required for this project; regardless of any variances that the contractor may obtain.

N. The Contractor shall be responsible for verifying the bid document drawing(s) provided and identifying any additional ACM that may exist. The proposals based upon these specifications shall be held as made with full knowledge of existing conditions and requirements.

O. The Contractor shall, in order to obtain a clear and complete knowledge of the scope of work, visit the premises and examine carefully the work involved and existing conditions before submitting his/her bid.

P. The Contractor shall field verify, prior to bid submission, all quantities of asbestos containing material to be removed, and all field conditions affecting the work. Any discrepancies between the Contract Documents and the field conditions shall be reported to the Construction Manager in writing prior to the submission of bids.

1.3.2 SPECIFIC MATERIALS TO BE REMOVED

All Interior Areas

MATERIAL
VINYL ASBESTOS FLOOR TILE AND MASTIC

A complete drawing package has been issued. All drawings should be reviewed. Some of the work is specified on the following:

Reference Ceiling Demolition Drawings
Reference Architectural Drawings
Reference Mechanical Drawings
Reference Schedule Drawings
Reference Work Location Plans
Reference Project Phasing Plans

A. Remove and dispose asbestos-containing floor tiles, mastic and leveling compound from the building as indicated. Floor tile and mastic must be bagged for disposal. All floor tile mastic is to be removed from the indicated areas. All leveling compound is to be removed. Floor tile mastics and leveling compounds are to be completely removed from the concrete substrate. Only wet methods with manual scraping shall be used. Floors shall be ready to accept new leveling compound and skim coat, and be re-tiled. Reference specification section and manufacturer's instructions for new floor installation. Abated floors must be approved and accepted by the floor installation contractor.

B. All movable objects will be removed from the work areas by others prior to the start of each phase of the project.

C. Contractor to construct isolation barriers that seal off all openings, including but not limited to windows, corridors, doorways, skylights, ducts, grilles, diffusers, and any other penetrations of the work areas. Where applicable, hallway lockers are also to be covered prior to ceiling demolition and floor tile removal.

Barriers are to be constructed using two layers of six mil fire-retardant plastic sheeting sealed with duct tape. Also, all seams in system components that pass through the work area shall be sealed. Doorways and corridors that shall not be used for passage during work shall also be sealed.

D. Critical barriers and HEPA filtered negative air filtration must be in-place before ceilings/walls can be demolished.

E. Floors that are to remain may include terrazzo, non-ACM floor tile, and linoleum (refer to the Contract Documents). These floors are to be protected from damage prior to beginning ceiling demolition.

M. Asbestos Containing Materials (ACM) shall be maintained in an adequately wet condition prior to, during, and after removal. No ACM is to be worked dry.

N. Contractor to double bag, label, and properly dispose of asbestos containing waste, and to provide completed waste manifest within 35 days of removal from the site. Waste Generator Labels are to be affixed to each bag of asbestos waste.

1.4 MEDICAL REQUIREMENTS

A. Medical requirements shall conform to 29 CFR 1926, Section 1926.1101.

1.4.1 Medical Examinations

1. Before being exposed to airborne asbestos fibers, workers shall be provided with a comprehensive medical examination as required by 29 CFR 1926, Section 926.1101 and other pertinent state or local requirements. This requirement must have been satisfied within the past year. The same medical examination shall be given on an annual basis to employees engage in an occupation involving asbestos and within 30 calendar days before or after the termination of employment in such occupation, X-ray films of asbestos workers shall be identified to the consulting radiologist and medical record jackets shall be marked with the word "asbestos."

1.4.2 Medical and Exposure Records

1. Complete and accurate records shall be maintained of each employee's Medical examinations, medical records and exposure data as required by 29 CFR 1910, Section 1910.20 and 29 CFR 1926, Section 1926.1101 for a period of 30 years after termination of employment.

2. Records of the required medical examinations and exposure data

shall be made available for inspection and copying to:

The Assistant Secretary of Labor for Occupational Safety and Health (OSHA) or authorized representatives of the employee and an employee's physician upon request of the employee or former employee. Maintain on file at the work site for review as requested by the Industrial Hygienist, a copy of the required medical certification for each employee.

1.5 TRAINING

A. Within 1 year prior to assignment and commencement of work on this asbestos abatement project, each worker directly involved in handling ACM, ACM generated wastes to include packaging and transporting such wastes for disposal, shall take and successfully complete a course of asbestos training as specified by United States Environmental Protection Agency (EPA) requirements at 40 CFR 763, Subpart E, Appendix C and the State of New York Industrial Code Rule 56. Workers shall take and successfully complete the "Worker" course. On-site supervisors and technical support personnel shall take and successfully complete the "Contractor/ Supervisor" course. Worker and Contractor/Supervisor courses taken more than 1 year prior to commencement of work are acceptable provided that the individual has successfully completed the annual refresher training as required by the regulatory agency.

B. Prior to the commencement of work, each worker shall be instructed by the Contractor's on-site "competent person" supervisor in the following project specific training: the hazards and health effects of the specific types of ACM to be abated, the content and requirements of the Contractor's Accident Prevention Plan, Hazard Communication Program, Site Safety and Health Plan, work practices, the use requirements and limitations of the personal protective clothing and equipment to be used, hands-on-training for each asbestos abatement technique to be employed, heat and/or cold stress monitoring specific to this project, personal hygiene and housekeeping requirements, air monitoring program and procedures, medical surveillance to include medical and exposure record keeping procedures, the association of cigarette smoke and asbestos-related disease, security procedures, emergency response requirements and all additional requirements of 29 CFR 1926, Section 1926.1101.

C. Training shall also include, for each employee, a respirator fit test administered by an Industrial Hygienist as required by 29 CFR 1926, Section 1926.1101.

1.6 RESPIRATORY PROTECTION PROGRAM

A. The Contractor shall establish in writing, and implement a respiratory protection program in accordance with 29 CFR 1926, Section 1926.1101, 29 CFR 1910, Section 1910.134, ANSI Z88.2, CGA G-

7 and CGA G-7.1.

The Contractor shall establish minimum respiratory protection requirements based on measured or anticipated levels of airborne asbestos fiber concentrations encountered during the performance of the asbestos abatement work. The Contractor's respiratory protection program shall include, but not be limited to, the following elements:

1. The company policy, used for the assignment of individual responsibility, accountability, and implementation of the respiratory protection program.

2. The standard operating procedures covering the selection and use of respirators. Respiratory selection shall be determined by the hazard to which the worker is exposed.

3. Medical evaluation of each user to verify that the worker may be assigned to an activity where respiratory protection is required.

4. Training in the proper use and limitations of respirators.

5. Respirator fit-testing, i.e., quantitative, qualitative and individual functional fit checks.

6. Regular cleaning and disinfection of respirators.

7. Routine inspection of respirators during cleaning and after each use when designated for emergency use.

8. Storage of respirators in convenient, clean, and sanitary locations.

9. Surveillance of work area conditions and degree of employee exposure (e.g., through air monitoring).

10. Regular evaluation of the continued effectiveness of the respiratory protection program.

11. Recognition and procedures for the resolution of special problems as they affect respirator use (e.g., no facial hair that comes between the respirator face piece and face or interferes with valve function; prescription eye wear usage; prohibition of wearing contact lenses; etc.).

12. Proper training in donning and doffing procedures.

1.7 HAZARD COMMUNICATION PROGRAM

A. A hazard communication program shall be established and implemented in accordance with 29 CFR 1926, Section 1926.59.

1.8 SAFETY AND HEALTH COMPLIANCE

A. In addition to detailed requirements of this specification, the work shall comply with applicable laws, ordinances, criteria, rules, and regulations of Federal, state, regional, and local authorities regarding handling, storing, transporting, and disposing of asbestos waste materials and with the applicable requirements of 29 CFR 1910, 29 CFR 1926, 40 CFR 61, Subpart A, and 40 CFR 61, Subpart M, NFPA 10, NFPA 70, NFPA 90A, and NFPA 101. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, rules, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirement as defined by the District shall apply.

B. The following state and local laws, rules and regulations regarding removal, encapsulation, encasement, enclosure, demolition, renovation, handling, storing, transporting and disposing of asbestos material apply:

1.	12 NYCRR Part 56	Asbestos - New York State Department of Labor
2.	6 NYCRR 364	New York State Department of Environmental Conservation, Bureau of Hazardous Waste Operations, Title 6, Part 364.

1.9 INDUSTRIAL HYGIENIST (IH)

A. Area air sampling and training shall be conducted under the direction of an IH experienced in asbestos abatement and who is currently certified by the State of New York Department of Labor as an Air Sampling Technician, retained by the District. For this project, the IH will also serve as the Project Designer's On-site Representative.

1.10 PERMITS, LICENSES, AND NOTIFICATIONS

A. Necessary permits and licenses shall be obtained in conjunction with the project asbestos abatement, transportation, and disposal actions and timely notification furnished of such actions required by federal, state, regional, and local authorities and as otherwise specified herein. The Contractor shall hold a valid NYS Asbestos Handling License. All Workers and Supervisors shall hold valid NYS asbestos certifications. Waste transporters must have valid NYS Waste Transporter Permits.

B. The Contractor shall notify the United States Environmental Protection Agency, the NYS Department of Labor Asbestos Control Bureau, Building Occupants, and the Project Designer in writing at

least 10 working days prior to the commencement of work in accordance with 40 CFR 61, Subpart M, and NYS Department of Labor requirements

to include the mandatory "Notification of Demolition and Renovation Record" form and other required notification documents and fees.

1.11 SUBMITTALS

A. The following submittals shall be submitted to the District prior to beginning work:

1. Location of decontamination units, negative air filtration units, negative air exhaust outlets, waste storage, and project phasing requirements shall be specified by the Contractor and submitted for the Owner's approval.

2. Corporate

NYS Asbestos Handling License
NYS Supervisor Certificate (for Supervisor of record on NYS License)
Insurance Certificates

3. Personnel

NYS Asbestos Supervisor Certificates
NYS Asbestos Handler Certificates
Proof of Medical Examinations
Proof of Respirator Fit Tests
Confined Space Training Certificates (if required)

4. Materials and Equipment

Manufacturer's catalog data for all materials and equipment to be used in the work, including brand name, model, capacity, performance characteristics and any other pertinent information. Test results and certificates from the manufacturer of encapsulants substantiating compliance with performance requirements of these specifications.

a. Material Safety Data Sheets for all chemicals to be used/stored on-site.

b. High efficiency filtered local exhaust equipment

c. Vacuum equipment

d. Pressure differential monitor

e. Air monitoring equipment

f. Respirators

g. Personal protective clothing and equipment

1) Coveralls
2) Underclothing
3) Other work clothing
4) Foot coverings
5) Hard hats
6) Eye protection
7) Other items required and approved by Contractor's IH

h. Glovebags

i. Duct Tape

j. Disposal Containers

1) Disposal bags
2) Fiberboard drums
3) Paperboard boxes

k. Sheet Plastic

1) Polyethylene Sheet - General
2) Polyethylene Sheet - Flame Resistant
3) Polyethylene Sheet - Reinforced

l. Wetting Agent

1) Amended Water
2) Removal encapsulant

m. Strippable Coating

n. Prefabricated Decontamination Unit(s)

o. Other items

p. Chemical encapsulant

q. Chemical encasement materials

r. Material Safety Data Sheets (for all chemicals proposed)

5. The following submittals shall be submitted to the District and the Project Monitor as they are available during the project:

a. Contractor OSHA personal air monitoring reports

b. Pressure differential recordings for local exhaust systems

c. Asbestos Regulated Work Area Entry Logs

d. Contractor Daily Logs

e. Asbestos Waste Shipment Record(s), (Waste Manifests)

6. Pressure Differential Recordings:

Pressure differential recordings shall be provided as required by Industrial Code Rule 56. Readings shall be reviewed by the Contractor's competent person supervisor prior to submittal. The Project Designer's on-site representative shall be notified immediately of any variance in the pressure differential which could cause adjacent unsealed areas to have asbestos fiber concentrations in excess of 0.005 fiber per cubic centimeter (f/cc) or background, whichever is higher.

7. Notifications:

The United States Environmental Protection Agency, the New York State Department of Labor Asbestos Control Bureau, and the School District shall be notified in writing 10 days prior to the start of asbestos work.

A Notification to Building Occupants must be posted 10 days prior to the start of asbestos work as required by 12 NYCRR Part 56 Subpart 56-1.8. This notification must remain in place until project completion and must include:

a. The room, location(s) or area designation of the asbestos project.

b. The amounts and types of asbestos or asbestos material, in square feet and/or linear feet that is being handled, removed, enclosed, encapsulated, or disturbed.

c. The commencement and completion dates of the asbestos project.

d. The name, address, and asbestos license number of the contractor performing the asbestos project.

e. The name and address of the air monitor and laboratory for the project.

A copy of the written notification shall be provided to any rental company concerning the intended use of rental equipment and the possibility of asbestos contamination, the decontamination procedures that will be used prior to the return of the equipment. A copy of the rental company's written acknowledgment and agreement shall be included in the

submittal.

8. Vacuum, Filtration and Ventilation Equipment

Manufacturer's certifications showing compliance with ANSI Z9.2 for:

a. Vacuums.

b. Water filtration equipment.

c. Ventilation equipment.

d. Other equipment required to contain airborne asbestos fibers.

9. Respirator Program:

Records of the respirator program as required by ANSI Z88.2, CFR 1910, Section 1910.134, 29 CFR 1926, Section 1926.1101.

10. Asbestos Waste Shipment Record(s) (Manifest):

Final completed copies of the Waste Shipment Record for all shipments of waste material as specified in 40 CFR 61, Subpart M and other required state waste manifest shipment records as specified herein. Detailed information of all asbestos waste disposals on the "MANDATORY WASTE SHIPMENT RECORD" form in accordance with revised 40 CFR 61 Subpart M. Such completed forms signed and dated by the agent of the landfill shall be submitted within 3 days after date of delivery of ACM to the landfill, but not later than 35 days from the date that the waste left the site.

1.12 PERSONAL PROTECTIVE EQUIPMENT

A. Three complete sets of personal protective equipment shall be made available to the Project Designer's on-site representative and authorized visitors for entry to the asbestos regulated work area at all times for inspection of the asbestos regulated work area. Authorized visitors shall be provided with training equivalent to that provided to Contractor employees in the selection, fitting, and use of the required personal protective equipment and the site safety and health requirements. Contractor workers shall be provided with personal protective clothing and equipment as specified herein and the Contractor shall ensure that it is worn properly. The Contractor's designated competent person supervisor shall select and approve all the required personal protective clothing and equipment to be used.

1.12.1 Respirators:

A. Respirators shall be selected and used in accordance with manufacturers recommendations, and shall be approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health (MSHA/NIOSH) for use in environments containing airborne asbestos fibers.

B. Personnel who handle ACM, enter asbestos regulated work areas that require the wearing of a respirator, or who are otherwise carrying out abatement activities that require the wearing of a respirator, shall be provided with approved respirators that are fully protective of the worker at the measured or anticipated airborne asbestos concentration level to be encountered.

C. For air-purifying respirators, the particulate filter portion of the cartridges or canister approved for use in airborne asbestos environments shall be Type H, high-efficiency particulate air (HEPA). As a minimum a half-mask respirator shall be worn during the startup of abatement activities, unless otherwise approved in writing by the Project Designer. The upgrading or downgrading of respirator type, from the minimum requirements specified for start-up, shall be made by the Project Designer based on the measured or anticipated airborne asbestos fiber concentrations to be encountered. All recommendations made by the Contractor to downgrade respirator type shall be submitted in writing to the Project Designer for acceptance. Contractor's actions to upgrade respirator type shall be verbally conveyed to the Project Designer.

D. Respiratory protection shall comply with the 29 CFR 1926, and 29 CFR 1910. A qualitative or quantitative fit test conforming to 29 CFR 1926, Appendix C shall be conducted by the Contractor for each Contractor worker required to wear a respirator, and for the authorized visitors who enter an asbestos regulated work area where respirators are required to be worn. A respirator fit test shall be performed for each worker prior to initially wearing a respirator on this project and every 6 months thereafter. If physical changes in a worker develop that will affect the fit, a new fit test shall be performed. Functional fit checks shall be performed by employees each time a respirator is put on and in accordance with the manufacturer's recommendations.

1.12.2 Whole Body Protection:

A. Personnel exposed to asbestos shall be provided with whole body protection as specified herein and such protection shall be worn properly. The Contractor's competent person supervisor shall select and approve the whole body protection to be used. Disposable whole body protection shall be disposed of as asbestos contaminated waste upon exiting from the asbestos regulated work area. Reusable whole body protection worn shall be either disposed of as asbestos contaminated waste upon exiting from the asbestos regulated work area or be properly laundered in accordance with 29 CFR 1926 and as

specified. Asbestos abatement whole body protection shall not be removed from the work site by a worker to be cleaned.

1.12.2.1 Coveralls:

Disposable - breathable coveralls with a zipper front shall be provided. Sleeves shall be secured at the wrists, and foot coverings secured at the ankles.

1.12.2.2 Gloves:

Disposable plastic or rubber gloves shall be provided to protect hands. Cloth gloves may be worn inside the plastic or rubber gloves for comfort, but shall not be used alone. Where there is the potential for hand injuries (i.e., scrapes, punctures, cuts, etc.) a suitable outer glove shall be provided and used.

1.12.2.3 Under Clothing:

Disposable underwear shall be provided and worn next to the skin or cloth under clothing.

1.12.2.4 Work Clothing:

An additional coverall similar to that required in paragraph "Coveralls" (1.12.2.1) shall be provided when the abatement and control method employed does not provide for the exit from the asbestos regulated work area directly into an attached decontamination unit. Cloth work clothes shall be provided for wear under the protective coverall and foot coverings when work is being conducted in low temperature conditions. Cloth work clothes shall be either disposed of as asbestos contaminated material or properly laundered in accordance with 29 CFR 1926.

1.12.2.5 Foot Coverings:

Cloth socks shall be provided and worn next to the skin. If rubber boots are not used foot wear and disposable foot coverings shall be provided. Rubber boots shall be used in moist or wet areas. Only rubber boots shall be removed from the asbestos regulated work area after being thoroughly decontaminated. All other protective foot covering shall be disposed of as ACM.

1.12.2.6 Head Covering:

Hood type disposable head covering shall be provided. In addition, protective head gear (hard hats) shall be provided as required. Hard hats shall only be removed from the asbestos regulated work area after being thoroughly decontaminated.

1.12.2.7 Protective Eye Wear:

Contact lenses shall not be worn in asbestos regulated work areas. When vision correction is necessary to perform the work task, prescription safety eye wear shall be used.

Fog-proof goggles shall be worn by personnel engaged in asbestos abatement activities in the asbestos regulated work area when the use of a full face-piece respirator is not required. Eye protection provided shall be in accordance with ANSI Z87.1.

1.12.2.8 Other Items:

All other items of whole body protection shall be provided as required and approved by the Contractor's competent person.

1.13 DECONTAMINATION UNIT, LOAD OUT UNIT AND ACCESS TUNNEL

A. A temporary negative pressure decontamination unit shall be provided. Utilization of prefabricated units shall have prior approval of the Project Designer. Decontamination and load-out unit shall be attached in a leak-tight manner to each asbestos regulated work area, unless otherwise stated specifically in the approved site specific variance. The unit shall be lockable. A key shall be given to the Owner so that the work area can be accessed while the Contractor is off-site. The decontamination unit shall have a separate equipment locker room and a clean locker room with a shower that complies with 29 CFR 1910, Section 1910.141 in between. Two separate lockers shall be provided for each asbestos worker, one in each locker room. Street clothing and street shoes shall be kept in the clean locker.

B. Upon exiting from the asbestos regulated work area to the equipment room, respirators shall be worn while asbestos contaminated protective clothing is HEPA-vacuumed, removed, and placed in approved labeled containers for disposal. Workers shall shower before changing into street clothes.

C. The Contractor shall provide a minimum of 2 showers. There shall also be at least one shower provided per six workers. Flow and temperature controls shall be located within the shower and be adjustable by the user. Should sufficient hot water be unavailable, the Contractor shall provide a minimum 150 liters (40 gallon) electric hot water heater with minimum recovery rate of 75 liters (20 gallons) per hour and a temperature controller for each shower head. Instantaneous type in-line water heater may be incorporated at each shower head in lieu of hot water heater upon approval by the Project Designer.

D. Used shower water shall be collected and filtered to remove asbestos

contamination. Filters and residue shall be disposed of as asbestos contaminated material. Filtered water shall be discharged to the sanitary system.

E. The waste water pump shall be sized for 1.25 times the shower head flow rate at a pressure head sufficient to satisfy the filter head loss and discharge line losses.

The pump shall supply a minimum 1.6 liters per second (25 gallons per minute) flow with 11 m. (35 ft.) of pressure head. Waste water filters shall be installed in series with the first stage pore size of 20 micrometer (microns) and the second stage pore size of 5 micrometer. (microns.) Waste water must be filtered prior to discharge to the sanitary system. Water that is not filtered must be drummed and disposed of as asbestos containing waste.

F. The floor of the decontamination unit's clean room shall be kept dry and clean at all times. Water from the shower shall not be allowed to wet the floor in the clean room. Surfaces of the clean room and shower shall be wet-wiped 2 times after each shift change with a disinfectant solution. Proper housekeeping and hygiene requirements shall be maintained.

G. Soap and towels shall be provided for showering, washing and drying. Any cloth towels provided shall be disposed of as ACM waste or be laundered in accordance with 29 CFR 1926.

H. Surfaces of the equipment room shall be wet-wiped 2 times after each shift change. Surfaces of the Load-Out-Unit and personnel decontamination unit shall be adequately wet-wiped 2 times after each shift change. Materials used for wet wiping shall be disposed of as asbestos contaminated waste.

1.14 WARNING SIGNS AND TAPE

A. Contractor shall ensure that all personnel understand the warning signs. Warning signs and tape printed in English and Spanish shall be provided at the regulated boundaries and entrances to asbestos regulated work areas. Signs shall be located at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Warning signs as shown and described herein shall be in vertical format conforming to 29 CFR 1910, and 29 CFR 1926, minimum 500 by 360 mm (20 by 14 inches) and displaying the following legend in the lower panel. Spacing between lines shall be at least equal to the height of the upper of any two lines:

Legend	Lettering
Danger	3 inch Sans Serif Gothic or Block
Asbestos	1 inch Sans Serif Gothic or Block

Cancer and Lung Disease Hazard	1 inch Sans Serif Gothic or Block
Authorized Personnel Only	1 inch Sans Serif Gothic or Block
Authorized Personnel Only	1 inch Gothic
Respirators and Protective Clothing are Required in this Area	1 inch Gothic

B. Decontamination unit signs shall be as herein.

C. Warning tape shall be provided.

1.15 WARNING LABELS

A. Warning labels shall be affixed to all asbestos disposal containers used to contain asbestos materials, scrap, waste debris, and other products contaminated with asbestos. Containers with preprinted warning labels conforming to requirements specified herein are acceptable. Warning labels shall conform to 29 CFR 1926 and shall be of sufficient size to be clearly legible displaying the following legend:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE
HAZARD

B. In addition to the required warning labels, all waste bags/containers shall be labeled with Waste Generator Labels per 40 CFR 61.150 (a)(v). Labels shall read as follows:

Waste Generator Labels for this Contract are to read as shown below:

Name of School District
Name of Project
Town, State

1.16 LOCAL NEGATIVE PRESSURE EXHAUST SYSTEM

A. A local negative pressure exhaust system shall be provided in the asbestos regulated work area in accordance with ANSI Z9.2 and 29 CFR 1926. The system will provide at least 4 air changes per hour inside of the containment or as required by the site specific variance. The local exhaust system shall be operated 24 hours per day, until the asbestos regulated containment area is removed. The exhaust system shall be equipped with HEPA filters and must be leak proof to the filters. The local exhaust system shall terminate out of doors.

B. Local exhaust equipment shall be sufficient to maintain a minimum pressure differential of minus 0.51 mm (0.02 inch) of water column relative to adjacent, unsealed areas. Pressure differential shall be monitored continuously, 24 hours per day, with an automatic recording instrument.

C. In no case shall the building ventilation system be used as the local exhaust system for the asbestos regulated work area. Filters on local exhaust system equipment shall conform to ANSI Z9.2 and UL 586.

Filter shall be UL labeled. All filters used shall be new at the beginning of the project and shall be periodically changed as necessary and disposed of as ACM waste.

1.17 TOOLS

A. Vacuums shall be leak proof to the filter, equipped with HEPA filters, be of sufficient capacity and provide the necessary capture velocity at the nozzle or nozzle attachment to efficiently collect, transport and retain the ACM waste material.

B. Power tools shall not be used to remove ACM unless the tool is equipped with effective, integral HEPA filtered exhaust ventilation capture and collection system or has otherwise been approved for use by the Project Designer.

C. All residual asbestos shall be removed from reusable tools prior to storage and reuse. Reusable tools shall be thoroughly decontaminated prior to being removed from asbestos regulated work areas.

1.18 RENTAL EQUIPMENT

A. If rental equipment is to be used, written notification shall be provided to the rental agency, concerning the intended use of the equipment, the possibility of asbestos contamination of the equipment and the steps that will be taken to decontaminate such equipment. A written acceptance of the terms of the Contractor's notification shall be obtained from the rental agency.

1.19 AIR MONITORING EQUIPMENT

A. The air sampling technician, supplied by the School District under a separate Professional Services contract, shall select the air monitoring equipment to be provided and used for evaluation of airborne asbestos fiber concentrations. The equipment shall include, but not be limited to:

1. High-volume sampling pumps that can be calibrated and operated at a constant airflow up to approximately 10 liters per minute when equipped with a sampling train of tubing and filter cassette.

2. Standard 25 millimeter diameter, 0.45 and 0.80 micrometer (micron) pore size, mixed cellulose ester membrane filters and cassettes with non-conductive barrels and shrink bands, to be used with high flow pumps when conducting environmental area sampling using NIOSH Pub No. 84-100 Methods 7400 and 7402 and the transmission electric microscopy method specified at 40 CFR 763.

3. Appropriate plastic tubing to connect the air sampling pump to the selected filter cassette.

4. A flow calibrator capable of calibration to within plus or minus 2 percent of reading over a temperature range of minus 20 degrees C (minus 4 degrees F) (minus 4 degrees Fahrenheit) to plus 60 degrees C (140 degrees F) (140 degrees Fahrenheit) and traceable to a National Institute for Standards and Technology (NIST) primary standard.

1.20 EXPENDABLE SUPPLIES

1.20.1 Glove Bags:

Glove bags shall be provided as described in 29 CFR 1926. The glove bag assembly shall be prefabricated with preprinted OSHA warning label and shall typically be constructed of 0.152 mm (6 mil) thick transparent polyethylene or polyvinyl chloride sheeting and at least two inward projecting long sleeves and an internal pouch. The glove bag shall be constructed and installed in such a manner that it surrounds the object or material to be removed and contains all asbestos fibers released during the process. The glove bag shall have sufficient capacity to hold removed materials and permit leak-tight sealing.

1.20.2 Duct Tape:

Industrial grade duct tape shall be provided in 50 mm (2 inch) and 76 mm (3 inch) widths and shall be suitable for bonding sheet plastic and disposal containers specified herein.

1.20.3 Disposal Containers:

Leak-tight disposal containers shall be provided for ACM generated wastes as specified herein. Leak-tight means that solids, liquids or dust cannot escape or spill out. All disposal containers shall be either pre-labeled or affixed with OSHA warning label as specified in 29 CFR 1926.

1.20.4 Disposal Bags:

One hundred fifty two thousandths millimeter (6 mil) thick leak-tight pre-labeled (OSHA warning label) bags shall be provided for placement of asbestos generated waste.

1.20.5 Leak-tight Wrapping:

Two layers of 0.152 mm (6 mil) minimum thick polyethylene sheet stock shall be used for the containment of removed asbestos-containing components or materials such as reactor vessels, large tanks, boilers, insulated pipe segments and other materials too large to be placed in disposal bags. Upon placement of the ACM component or material, each layer shall be individually leak-tight sealed with duct tape.

1.20.6 Fiberboard Drums:

Fiberboard drums are not required by state or local requirements.

1.20.7 Cardboard Boxes:

Heavy-duty corrugated cardboard boxes are not required.

1.20.8 Sheet Plastic:

Sheet plastic shall be provided as specified herein and in the largest sheet size necessary to minimize seams, as indicated on the project drawings.

1.20.8.1 Polyethylene Sheet – General:

One hundred fifty two thousandths millimeter (6 mil) minimum thick polyethylene film shall be clear and conform to ASTM D 4397.

1.20.8.2 Polyethylene Sheet - Flame Resistant:

Where a potential for fire exists, 0.152 mm (6 mil) minimum thick flame-resistant polyethylene sheet shall be provided. Flame-resistant polyethylene film shall be frosted and shall conform to the requirements of NFPA 701.

1.20.8.3 Polyethylene Sheet-Reinforced:

One hundred fifty two thousandths millimeters (6 mil)thick reinforced polyethylene sheet shall be provided where high skin strength is required such as where it constitutes the only barrier between the asbestos regulated work area and the outdoor environment. The sheet stock shall consist of translucent, nylon-reinforced or woven-polyethylene thread laminated between two layers of polyethylene film. Film shall meet flame resistant standards of NFPA 701.

1.20.8.4 Viewing Inspection Window:

Where feasible, a minimum of one clear 3.2 mm (1/8 inch) thick acrylic sheet, 450 mm by 600 mm, (18 inches by 24 inches) shall be installed as a viewing inspection window at eye level on a wall in each containment enclosure. All such windows shall be sealed leak-tight with industrial grade duct tape.

1.20.9 Wetting Agents:

1.20.9.1 Amended Water

Amended water shall meet the requirements of ASTM D 1331.

1.20.9.2 Removal Encapsulant:

Removal encapsulant (a penetrating encapsulant) shall be provided when conducting removal abatement activities that require a longer removal time or are subject to rapid evaporation of amended water.

The removal encapsulant shall be capable of wetting the ACM and retarding fiber release during disturbance of the ACM equal to or greater than provided by amended water. Performance requirements for penetrating encapsulants are specified in paragraph ENCAPSULANTS.

1.20.10 Strippable Coating:

Strippable coating in aerosol cans shall be used to adhere to surfaces and to be removed cleanly by stripping at the completion of work. Since these coatings have a hydrocarbon carrying agent, their use shall be confined to well ventilated areas.

1.21 MATERIAL SAFETY DATA SHEETS

Material safety data sheets (MSDS) shall be provided for all hazardous materials brought onto the work-site. One copy shall be provided to the Project Designer's on-site Representative and one copy shall be included in the Contractor's Hazard Communication Program.

1.22 OTHER ITEMS

A sufficient quantity of other items shall be provided that may include, but not be limited to: scrapers, brushes, brooms, staple guns, tarpaulins, shovels, rubber squeegees, dust pans, other tools, scaffolding, staging, enclosed chutes, wooden ladders, lumber necessary for the construction of asbestos regulated containment work areas, UL approved temporary electrical equipment, material and chords, ground fault circuit interrupters, water hoses of sufficient length, fire extinguishers, first aid kits, portable toilets, logbooks, log forms, markers with indelible ink, spray paint in bright color to mark areas, project boundary fencing, etc.

1.23 PRECONSTRUCTION CONFERENCE

The Contractor, the Contractor's designated supervisor and the Project Designer's Representative shall meet with the School District prior to beginning work at a safety preconstruction conference to discuss the details of the Contractor's work procedures and safety precautions. Once accepted by the Project

Designer's Representative, these procedures and precautions will be enforced as if an addition to the specification. Any changes required in the specification as a result shall be identified specifically in the plan to allow for free discussion and acceptance by the Project Designer's Representative prior to the start of work.

PART 2 - PRODUCTS

2.1 ENCAPSULANTS

A. Encapsulants shall conform to US EPA requirements, shall contain no toxic or hazardous substances and no solvent and shall meet the following requirements:

ALL ENCAPSULANTS

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E 84
Combustion Toxicity Zero Mortality	University of Pittsburgh Protocol
Life Expectancy - 20 years	ASTM C 732 Accelerated Aging Test
Permeance - Minimum 2.288 by 10E 8 grams per Pascal per second per square meter (0.4 perms)	ASTM E 96

Additional Requirements for Bridging Encapsulant

Requirement	Test Standard
Cohesion/Adhesion Test - 2394 Pa (50 psf)	ASTM E 736
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test Classified by UL for use over fibrous and cementitious sprayed	ASTM E 119

fireproofing)

Impact Resistance - Minimum 0.495 kg meters (43 inch pounds)	ASTM D 2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D 522 Mandrel Bend Test

Additional Requirement for Penetrating Encapsulant

Requirement	Test Standard
Cohesion/Adhesion Test - 2394 Pa (150 psf) 50 pounds of force/square foot	ASTM E 736
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E 119
Impact Resistance - Minimum 0.495 kg meters (43 inch pounds)	ASTM D 2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D 522 Mandrel Bend Test

Additional Requirement for Lock-Down Encapsulant

Requirement	Test Standard
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Tested with fireproofing over encapsulant applied directly to steel member)	ASTM E 119
Bond Strength; 4788 kPa (100 psf) (Tests compatibility with cementitious and fibrous fireproofing)	ASTM E 736

PART 3 - EXECUTION

3.1 GENERAL

A. All asbestos abatement work tasks as shown on the detailed plan, illustrated in the drawings, as summarized in Section 1.3

(DESCRIPTION OF WORK), shall be performed as specified herein.

B. Personnel shall wear and utilize protective clothing and equipment as specified herein when working with both friable and non-friable asbestos materials during all phases of abatement work, including precleaning, work area preparation, abatement, and post cleanings work.

C. Eating, smoking, drinking, or applying cosmetics shall not be permitted in the asbestos regulated work area.

D. All hot work (burning, cutting, welding, etc.) shall be conducted under strictly controlled conditions in conformance with 29 CFR 1926. The Project Designer and District Representative must be notified prior to beginning hot work.

E. Personnel of other trades not engaged in asbestos abatement activities shall not be exposed at any time to airborne concentrations of asbestos unless all the administrative and personal protective provisions as required herein are complied with.

F. Electrical service shall be disconnected and locked-out. The Contractor shall provide temporary electrical service and lighting where needed using ground fault interrupt protected circuits (GFCI). The Contractor is responsible to ensure that unprotected electric power running into or through the work areas has been locked-out prior to allowing personnel to begin work.

G. The building heating, ventilating, and air conditioning system shall be shut down, openings to the system capped, and temporary ventilation provided prior to the commencement of abatement work.

H. The Contractor shall install critical barriers that seal all openings, including but not limited to windows, corridors, doorways, skylights, ducts, grilles, diffusers, and any other penetration of the work area.

I. If an asbestos spill occurs outside of the asbestos regulated work area, work shall be stopped and the Project Monitor shall be notified. The condition shall be corrected to the satisfaction of the Project Monitor including air sampling, prior to resumption of work.

J. The Contractor shall stop abatement work in the asbestos regulated work area immediately when the measured airborne total fiber concentrations, as sampled and analyzed as required herein, (1) equals or exceeds 0.01 f/cc or the pre-abatement concentration, whichever is greater - outside the asbestos regulated work area, or (2) equals or exceeds 1.0 f/cc inside the asbestos regulated work area. The Contractor shall correct the condition to the satisfaction of the Project Designer, including visual inspection

and air samplings. Work resumption will only be allowed upon notification by the Project Designer. Corrective actions shall be documented.

3.2 PROTECTION OF ADJACENT WORK OR AREAS TO REMAIN

A. Asbestos abatement work shall be performed without damage or contamination of adjacent work or area. Where such work or area is damaged or contaminated as verified by the Project Designer using visual inspection and/or sample analysis, it shall be restored to its original condition or decontaminated by the Contractor at no expense to the District as deemed appropriate by the Project Designer.

This includes inadvertent spill of dirt, dust or debris in which it is reasonable to conclude that asbestos may exist. When these spills occur, work shall stop in all affected areas immediately and the spill shall be cleaned. When satisfactory visual inspection and/or sampling analysis results are obtained and have been evaluated by the Project Designer and the District, work may proceed.

3.3 FURNISHINGS

3.3.1 Removal of Furnishings:

Movable furniture and equipment will be removed from the areas of work by the School District before asbestos abatement work begins.

3.3.2 Furnishings to Remain in Place: None.

3.4 BUILDING VENTILATION SYSTEM AND CRITICAL BARRIERS

A. Any building ventilating system supplying air into or returning air out of an asbestos regulated work area shall be shut down and isolated by lockable switch or other positive means in accordance with 29 CFR 1910, Section 1910.147, to prevent accidental start-up and isolated by airtight seals to prevent contaminant spread through the system.

B. Air-tight critical barriers shall be installed on all building ventilating openings that supply, or return air from the building ventilation system or serves to exhaust air from the building, that are located inside the asbestos regulated work area. The critical barriers shall consist of 2 layers of 0.152 mm (6 mil) fire-retardent polyethylene. Edges to wall, ceiling and floor surfaces shall be sealed with industrial grade duct tape.

3.5 PRECLEANING

A. After installation of the personnel and waste decontamination unit(s), installation of critical barriers, and establishment of

negative air pressure differential all surfaces shall be cleaned by HEPA vacuum and adequately wet wiped prior to constructing tent enclosures, hanging glovebags, or establishment of full containment.

3.6 ASBESTOS CONTROL AREA REQUIREMENTS

A. Work under this contract is indoors, and as such, shall be in indoor regulated work areas, isolated within containment enclosures, and otherwise secured by means of physical barriers, boundary warning tape, and signs, etc., to control access by unauthorized persons.

B. Regulated containment areas shall be established and maintained for each abatement work task.

Viewing inspection windows shall be installed on the wall of the containment enclosure, as specified in paragraph Viewing Inspection. The following procedures shall be performed sequentially and each activity shall be completed before proceeding to the next.

1. Furnishings in the asbestos regulated work area shall be removed as specified at paragraph FURNISHINGS.

2. Tools, scaffolding, staging, etc., necessary for the work shall be placed in the area to be isolated prior to erection of work area enclosed containment.

3. Building ventilating systems serving the work area shall be shutdown or isolated.

4. Power to the asbestos regulated work area shall be locked-out by switching off all breakers serving power or lighting to this area in accordance with 29 CFR 1910, and 12 NYCRR Part 56.

5. Power running through the asbestos regulated work area to other areas of the building shall be locked-out by switching off all breakers serving power through the area in accordance with 29 CFR 1910, and 12 NYCRR Part 56.

6. The Contractor's electrician will hook up the Contractor's GFI electrical panel to the building electrical system.

7. The Contractor shall provide temporary lighting.

8. Personnel Decontamination Unit shall be installed as specified. Load-Out unit shall be installed as specified herein.

9. Critical barriers shall be installed as required for building ventilation system.

10. Surfaces shall be precleaned as required by paragraph PRECLEANING.

11. Local exhaust ventilation system shall be installed as specified.

12. Containment areas shall be installed as required for each abatement task as specified.

3.7 CLEAN-UP

A. The Contractor shall maintain a clean work area by performing the following housekeeping functions on a daily basis as required, and at the end of each shift:

1. Asbestos containing waste shall not be allowed to accumulate, but shall be bagged upon removal.

2. Loose ACM shall be prepared for disposal by packaging the waste and removing it from the work area to the load-out area.

3. Meticulous attention shall be given to restricting the spread of dust and debris.

4. Work area shall be HEPA vacuumed.
5. Negative air filtration equipment shall be inspected and maintained in good working order. Pre-filters and HEPA filters shall be checked and changed as needed. Exhaust ducts shall be checked and repaired/changed as needed.

6. Polyethylene in work and high traffic areas shall be inspected and repaired.

7. Containment area shall be HEPA vacuumed and wet wiped if air sample results exceed prescribed level.

3.8 GLOVE BAG

A. Glove bag Operations shall be conducted in accordance with 12 NYCRR Part 56 Subpart 56-16 or Applicable Variance AV-108. Asbestos regulated work areas may be established as required for glove bag abatement. Designated boundary limits for the asbestos work shall be established with warning tape or other continuous barriers and all other requirements for asbestos control areas shall be maintained including area signs and boundary warning tape as specified.

B. Area monitoring of airborne asbestos fibers shall be conducted during each work shift at the designated boundary limits, and personal air monitoring shall be performed for each worker engaged in asbestos handling (removal, disposal, transport, and other associated work) at such frequency as specified in 29 CFR 1926.1101

and the air monitoring plan.

C. If the concentration of asbestos fibers monitored at the breathing zone of the workers or at designated boundary limits at any times exceeds 0.01 f/cc or the pre-abatement level, whichever is greater, work shall be stopped and the Project Designer shall be notified. The Contractor shall correct the condition to the satisfaction of the Project Designer to include visual inspection and air sampling. Work resumption will only be allowed upon notification by the Project Designer. If adjacent areas outside the regulated work area are contaminated, the Contractor at his expense, shall clean the contaminated area. The Project Monitor shall visually inspect the cleaned area, and conduct air monitoring at the Contractor's expense.

Tent Method:

This method shall be used as a full containment around the asbestos materials to be abated. Width of tent shall be a minimum of 6 feet. Tent Procedures shall be conducted as follows:

A. Tent procedures shall be accomplished in a constructed or commercially available plastic tent, plasticizing and sealing all surfaces not being abated within the tent periphery forming an enclosure. The tent shall be of double layered 6-mil PVC at a minimum, with seams heat-sealed, or double-folded, stapled and taped airtight and then taped flush with the adjacent tent wall. Tent construction shall have vertical studs at 2 foot spacing maximum.

B. Asbestos handlers involved in the tent procedure shall wear two disposable suits, including gloves, hood and footwear, and appropriate respiratory equipment. A decontamination unit (with shower and clean room) is contiguous to the work area, only one layer of disposable personal protective equipment shall be required; in this case, prior to exiting the tent the worker shall HEPA vacuum and wet clean the disposable suit.

C. The tent shall be attached to the surface to produce an airtight seal except for an appropriate section to allow for make-up air into the tent.

D. A Negative Air Machine shall be used to continuously exhaust the enclosed area. A minimum of 5 volume changes per hour is required.

E. Removal of ACM shall be by wet methods.

F. ACM removed shall be placed in a leak-tight container.

G. Upon completion of abatement, and prior to tent collapse, the enclosed surfaces shall:

1. be wet cleaned using rags, mops or sponges; and

2. be permitted sufficient time to dry, prior to HEPA vacuuming all substrates; and

H. Upon barrier disturbance, loss of engineering controls, or termination of tent usage, the tent and the enclosed surfaces shall be treated according to subdivision (G) above.

I. The bagged waste shall be wet cleaned or HEPA vacuumed and then transferred outside the tent, double bagged, and appropriately handled prior to disposal.

J. All abated surface shall receive a light coat of Encapsulant after clearance air test results are achieved.

K. Tent shall not be dismantled until acceptable clearance air results have been achieved.

Glovebag Method

This method shall be used to abate any piping not directly inside a tent or full containment.

Glovebag Procedures - Glovebag procedures on pipe lagging shall be done using commercially reliable glovebags of PVC or polyethylene, appropriately sized for the project. Glovebags may not be shifted down a pipe or duct and shall not be removed from the initial pipe to another pipe, or reinstalled on the initial pipe once removed.

A. Abatement of ACM's shall be by wet methods. Dry removal activities of ACM's is prohibited.

B. Stationary glovebag procedures on pipe lagging shall be done using commercially available glovebag of a minimum of 6-mil clear plastic, appropriately sized for the project. These glovebags shall not be shifted, moved, installed or reused once used for ACM removal.

C. The glovebag procedures shall be performed in accordance with the following:

1. All necessary tools and materials shall be brought into the work area before the glovebag procedure begins.

2. Air monitoring shall be conducted.

3. Glovebag procedures shall be conducted by workers specifically trained in glovebag procedures and equipped with appropriate personal protective equipment.

4. The pipe insulation diameter worked shall not exceed one half the bag working length above the attached gloves.

5. The ACM within the secured glovebag shall be wetted with amended water prior to stripping.

6. The bag shall be attached over duct tape which has been placed securely around the insulation, forming a smooth seal. The bag shall be securely attached to the insulation in a manner to prevent air transfer.

7. The integrity of the glovebag seal shall be smoke tested. The contents of the smoke tube shall be aspirated through the water port access sleeve of the bag. After twist sealing the access sleeve, the bag shall be squeezed gently to check for leakage points which are then taped airtight.

8. If the pipe insulation adjacent to the section which will be worked on is damaged, or if the pipe insulation terminates or is jointed or contains an elbow adjacent to the work section, the adjacent insulation shall be wrapped in 6-mil polyethylene sheeting and sealed airtight with duct tape.

9. After the insulation has been removed, the pipe shall be sprayed with amended water and brush-scrubbed to remove all visible ACM. The pipe, the interior of the bag, the insulation and the tools shall then be sprayed with amended water. The enclosed volume shall be misted and time allowed for the mist to settle out before breaking the seal or removal of the glovebag.

10. Any pipe insulation ends created by this procedure shall be thoroughly wetted before bag removal and sealed with wettable cloth end caps and bridging encapsulant or any combination of these materials immediately following bag removal.

11. The tool pouch shall be separated from the bag prior to disposal by twisting it and the wall to which it is attached several times, and taping the twist to hold it in place, thus sealing the bag and the pouch which are severed at the midpoint of the twist. Alternatively, the tools can be pulled through with one or both glove inserts, thus turning the gloves inside out. The glove(s) is/are then twist sealed forming a new pouch taped and severed mid-seal forming two separate bags.

12. A HEPA vacuum shall be used for evacuation of the glovebag in preparation for removal of the bag from the pipe or duct, for clean-up in the event of a spill, and for post project cleanup.

13. With the glovebag collapsed and the ACM in the bottom of the bag, the bag shall be twisted several times and taped to seal that section during bag removal.

14. A 6-mil plastic bag shall be slipped around the glovebag while it is still attached to the pipe. The bag shall be detached from the pipe by removing the tape or cutting the top with a blunt scissors.

15. The asbestos-containing waste, the clean-up materials, and protective clothing shall be wetted sufficiently, double-bagged minimizing air content, sealed separately, and disposed of.

NOTE: Glovebag procedures which are large asbestos projects or part of a large asbestos project shall be conducted in accordance with all large asbestos project procedures.

3.9 ASBESTOS HANDLING PROCEDURES

A. The Contractor shall employ proper handling procedures in accordance with 29 CFR 1926 and 40 CFR 61, Subpart M, 12 NYCRR Part 56, and the specification requirements herein. The specific abatement techniques shall include but not limited to details of construction materials, equipment, and handling procedures. Following task descriptions detail the required abatement handling technique:

3.9.1 Following Mechanical components shall be removed:

Floor Tile and Mastic
Floor Tile Mastic / Leveling Compounds
Other Materials Not Listed May Be Present And May Contain Asbestos.

After completion of all asbestos removal work, surfaces from which asbestos containing materials have been removed shall be wet wiped and sponged clean, or cleaned by some equivalent method to remove all visible residue. Run-off water shall be collected and filtered through the dual filtration system. A first filter shall be provided to remove fibers 20 micrometers and larger and a final filter provided that removes all fibers 5 micrometers and larger. Waste water must be filtered prior to discharge to the sanitary system. Water that is not filtered must be drummed and disposed of as asbestos containing waste.

After the gross amounts of asbestos have been removed from every surface, all remaining visible accumulations of asbestos on floors shall be collected using plastic shovels, rubber squeegees, rubber dustpans and HEPA vacuum cleaners as appropriate to maintain the

integrity of the containment barrier. When all insulation has been removed, handlers shall use HEPA vacuum cleaners to vacuum every surface. Particular attention shall be paid to those surfaces or locations which could harbor accumulations or residual asbestos dust. All work areas must ultimately be cleaned in accordance with ASTM E 1368 Visual Inspection of Asbestos Abatement Projects.

3.9.2 Sealing Contaminated Items Designated for Disposal:

Contaminated architectural, mechanical, and electrical appurtenances such as Venetian blinds, full height partitions, carpeting, duct work, pipes and fittings, radiators, light fixtures, conduit panels, and other contaminated items designated for removal shall be coated with an asbestos lock down encapsulant at the demolition site before being removed from the asbestos control area. These items need not be vacuumed prior to application of the lock-down encapsulant.

The asbestos lock down encapsulant shall be tinted a contrasting color. It shall be spray applied by airless method. Thoroughness of sealing operation shall be visually gauged by the extent of colored coating on exposed surfaces.

3.10 FINAL CLEANING AND VISUAL INSPECTION

A. The abated asbestos regulated work area shall be cleaned by collecting, packing, and storing all gross contamination. A final cleaning shall use HEPA vacuum and wet cleaning of all exposed surfaces and equipment in the asbestos regulated work area.

B. Upon completion of the cleaning, the Contractor shall conduct a visual pre-inspection of the cleaned area in preparation for a final inspection before final air clearance monitoring and reclean, as necessary.

C. Upon completion of the final cleaning, the Contractor and the Project Monitor shall conduct a final visual inspection of the cleaned work area in accordance with ASTM E 1368 and document the results on the Final Cleaning and Visual Inspection as specified. If the Industrial Hygienist rejects the abatement area as not meeting final cleaning requirements, the Contractor shall reclean as necessary and have a follow-on inspection conducted with the Industrial Hygienist.

D. Recleaning and follow-up reinspections, including air sampling, shall be at the Contractor's expense.

3.11 OSHA PERSONAL AIR SAMPLING

A. Sampling and analysis of airborne concentration of asbestos fibers inside the work area shall be performed by the Contractor in

accordance with 29 CFR 1926 Section 1926.1101, as specified herein. Personal air monitoring samples shall be taken for at least 25 percent of the workers in each shift, or a minimum of two, whichever is greater. Results of the personal samples shall be posted at the job site no later than 24 hours after from the end of the work shift, and made available to the Project Designer as specified herein.

B. The Contractor shall maintain a fiber concentration inside enclosed containment regulated work area equal to or less than 0.1 f/cc expressed as an 8 hour, time-weighted average (TWA) during the conduct of the asbestos abatement. If fiber concentration rises above 0.1 f/cc, work procedures shall be investigated with the Project Designer to determine the cause.

C. The Contractor's workers shall not be exposed to an airborne fiber concentration in excess of 1.0 f/cc, as average over a sampling period of 30 minutes.

Should either an environmental concentration of 0.1 f/cc expressed as an 8-hour TWA or a personal excursion concentration of 1.0 f/cc expressed as a 30-minute sample occur inside the contained (enclosure) regulated work area, the Contractor shall stop work immediately, notify the Project Designer, and implement additional engineering controls and work practice controls to reduce airborne fiber levels below prescribed limits in the work area. Work shall not restart until authorized by the Project Designer.

D. Monitoring shall be performed to provide air monitoring results at the 95 percent confidence level.

E. For personal sampling required by 29 CFR 1926 Section 1926.1101, the NIOSH Pub No. 84-100 Method 7400 shall be used for sampling and Phase Contrast Microscopy (PCM) analysis. The Contractor shall obtain the services of an independent testing laboratory with qualified analysts and appropriate equipment to conduct sample analyses of air samples using the methods prescribed in 29 CFR 1926 Section 1926.1101 to include NIOSH Pub No. 84-100 Method 7400.

3.12 AREA AIR MONITORING

A. Work Area sampling performed in accordance with 29 CFR 1926 Section 1926.1101, and 12 NYCRR Part 56 Subpart 56-17 shall be performed by the air sampling technician. Sampling performed after final clean-up, i.e. final clearance air sampling, shall be performed by the air sampling technician. For environmental quality control and final air clearance NIOSH Pub No. 84-100 Method 7400 (PCM) shall be used. For environmental and final clearance samples, sampling will be conducted at a sufficient velocity and time to collect a sample volume necessary to establish the limit of detection of the method used at 0.005 f/cc. Asbestos fiber concentration confirmation of the

total fiber concentration results of environmental, quality assurance and final air clearance samples, collected and analyzed by NIOSH Pub No. 84-100 Method 7400, will be conducted.

3.12.1 Sampling Prior to Asbestos Work:

The baseline air sampling shall be established one day prior to the masking and sealing operations for each abatement area site. The background shall be established by performing area sampling in similar but uncontaminated sites in the building. Pre-abatement NIOSH Pub No. 84-100 Method 7400, PCM air samples shall be collected at a minimum of five locations. These locations are: outside the building, inside the building, but outside the abatement area perimeter and inside each abatement area. One sample shall be collected for every 185 square meters (2000 square feet) of floor space. At least two sample locations shall be collected outside the building. The PCM samples shall be analyzed immediately.

3.12.2 Sampling During Asbestos Abatement Work:

During abatement NIOSH Pub No. 84-100 Method 7400, PCM air samples shall be collected at a minimum of five locations outside the work area per 12 NYCRR Part 56 on a daily basis. Sampling inside work areas during abatement may be required to monitor work done utilizing Applicable Variances, or site specific variances obtained by the Contractor.

If the sampling outside the containment area shows airborne fiber levels have exceeded background or 0.01 f/cc, whichever is greater, all work shall be stopped immediately, and the Project Designer notified. The condition causing the increase shall be corrected. Work shall not restart until authorized by the Project Designer. Where glove bag methods are used, personal and area air sampling shall be performed at locations and frequencies that will accurately characterize any evolving airborne fiber levels.

The Contractor shall provide OSHA personal sampling as indicated in 29 CFR 1926 Section 1926.1101 and discussed in paragraph 3.11 of this specification.

3.12.3 Sampling After Final Clean-Up (Clearance Sampling):

Prior to conducting final air clearance monitoring, the Contractor and the industrial hygienist shall conduct a final visual inspection of the Contractor's final clean-up of the abated asbestos regulated work area as specified. Final clearance air monitoring shall not begin until acceptance of the final cleaning by the industrial hygienist. The air sampling technician will provide area sampling of airborne fibers using aggressive air sampling techniques as defined in the EPA 560/5-85-024 or as otherwise required by Federal or State requirements. The

sampling and analytical method used will be NIOSH Pub. No. 84-100 Method 7400 for PCM and AHERA Regulation 763 Part E, for Transmission Electron Microscopy. The final clearance air samples shall be collected at least 12 hours after wet cleaning has been completed with no visible water in the work area.

3.12.3.1 NIOSH Method:

For Phase Contrast Microscopy (PCM) sampling and analysis using NIOSH Pub No. 84-100 Method 7400, the fiber concentration inside the abated asbestos regulated work area, for each airborne sample shall be less than 0.01 f/cc. Decontamination of the abated asbestos regulated work area is considered complete when every PCM final clearance sample is below the clearance limit. If any sample result is greater than 0.01 f/cc then abatement is incomplete and recleaning is required. Upon completion of any recleaning, Re sampling with results to meet the above clearance criteria is required.

3.12.3.2 EPA Method:

An additional set of Final Clearance inside work area samples will be collected and analyzed per EPA 40 CFR 763 Subpart E Method Transmission Electron Microscopy(TEM).

3.12.3.3 Air Clearance Failure:

Should clearance sampling results fail to meet the final clean-up requirements, the contractor shall pay all costs associated with the recleaning, Re sampling and analysis, including costs of the building owner, until final clean-up requirements are met.

3.13 SITE INSPECTION

While performing asbestos abatement work, the Contractor shall be subject to on-site inspection by the Project Designer's Representative, who may be assisted or represented by quality assurance, safety, and industrial hygiene personnel. If the work is found to be in violation of this specification, the project designer or his representative will issue a stop work order to be in effect immediately until the violation is resolved. Costs associated with the standby time required to resolve the violation shall be at the Contractor's expense.

3.14 CLEAN-UP AND DISPOSAL

3.14.1 Housekeeping:

Surfaces of the regulated work area shall be kept free of accumulation of asbestos-containing debris. Meticulous attention shall be given to restricting the spread of dust and debris. HEPA filtered vacuum

cleaners shall be used. The space shall not be blown down with compressed air. When asbestos removal is complete, all asbestos waste is removed from the work site, and final clean-up is completed, the Project Designer will certify the areas as safe before before the warning signs and boundary warning tape can be removed. The Project Designer's representative will visually inspect all surfaces within the containment for residual material or accumulated debris. The contractor shall reclean all areas where dust or residual materials are identified until they are certified clean by the representative. The project designer shall certify in writing that the area may be reoccupied before entry by uncertified personnel is permitted.

3.14.2 Title to Materials:

Material resulting from abatement work, except asbestos waste, shall become the property of the Contractor and shall be disposed of as specified in applicable federal, state and local regulations. The contractor is responsible to properly handle, label, manifest, transport and dispose of asbestos waste.

3.14.3 Collection and Disposal of Asbestos:

Asbestos waste, asbestos contaminated water, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing, shall be collected and placed in sealed, leak tight containers (e.g. double 0.152 mm (6 mil) plastic bags) or sealed in 0.152 mm (6 mil) double wrapped polyethylene sheets. Waste within the containers must be wetted in case the container is breached. An OSHA warning label, Waste generator label, and Department of Transportation (DOT) label shall be affixed or preprinted on each bag. Waste asbestos material shall be disposed of at an EPA, state and local approved asbestos landfill. For temporary storage, sealed impermeable containers shall be stored in the asbestos holding area or in a storage/transportation conveyance (i.e. dumpster, roll off waste box, etc.), in a manner as accepted by and in an area assigned by the District. The procedure for hauling and disposal shall comply with 40 CFR 61, Subpart M, state, regional, and local standards.

3.14.4 Asbestos Waste Shipment Record:

The contractor shall complete and provide final completed copies of the Waste Shipment Record (Waste Manifest) for all shipments of waste material as specified in 40 CFR 61, Subpart M and other required state waste manifest shipment records within three days of delivery to the landfill. The Waste Shipment Record must be signed by the Contractor (generator), the transporter, and the landfill representative. The completed waste shipment record must be delivered to the District no later than 35 days after the waste leaves the site.

END OF SECTION

DIVISION 2-SITE WORK

SECTION 02000 – SITE WORK GENERAL PROVISIONS

1.01 GENERAL:

A. Applicable provisions of the "Conditions of the Contract" shall govern the work of this section and under Division 2.

1.02 SCOPE/SUMMARY:

A. The Drawings and Specifications are intended to provide for a complete and ready for operation installation. However, both the Drawings and Specifications are for the Contractor's guidance and are not intended to give every detail of the existing conditions or new installations nor do they describe every fitting required for the installation of the work. The Contractor shall furnish, install, and place in workmanlike manner all equipment, accessories, supports, fittings, and all other material needed for the complete installation.

B. Before submitting his proposal, the Contractor shall be fully informed to the extent, character and intent of the work to be done by him. No consideration will be granted for any misunderstanding of the material to be furnished or work to be performed.

C. The site work scope shall include providing all plant facilities, labor, materials, tools, equipment, appliances and supervision necessary or incidental to complete site work, including, but not limited to, the following:

1. Surveying and layout work
2. Preliminary work
3. Demolition
4. Clearing and grubbing
5. Striping and stockpiling existing topsoil
6. Protection
7. Removal and disposal
8. Rough grading, excavating, filling, backfilling and dewatering
9. Excavating, trenching, and backfilling for utility systems including gas, water, electric, telephone, storm and sanitary lines.
10. Sediment and erosion control procedures as may be required.
11. Storm water drainage systems, catch basins and manholes
12. Site improvements, including but not limited to, fencing, curbing, striping, signage, guardrails, paving, lighting, retaining walls and miscellaneous related work.
13. Landscape work
14. Finish grading and paving
15. Site work water mains, electric and gas services
16. Sanitary sewer systems, including manholes and exterior grease traps
17. Concrete work in connection with site preparation and development

D. Perform all work in accordance with all applicable local, state, and federal codes, laws, and ordinances.

E. Sediment and erosion control procedures shall be performed as required and in conformance with specification section 02220; and for LEED Certified projects, in accordance with the requirements of LEED SS Prerequisite 1

F. If the project is of a size and scope that requires a Storm Water Pollution Prevention Plan (SWPPP) refer to additional documentation provided elsewhere herein and conform to its requirements in conjunction with and as related to this section.

1.03 GENERAL PROVISIONS:

A. Verifying Existing Conditions:

1. The Contractor, before submitting his bid, shall examine the site to which this work is in any way dependent upon according to the intent of these Specifications and accompanying Drawings. He shall report to the Architect, in writing, prior to his bid any conditions which prevent him from performing his work. No "Waiver of Responsibility" for inadequate, incomplete, or defective work will be considered by the Architect unless written notice has been filed by the Contractor.

B. Cooperation:

1. When a project involves construction on an existing occupied site, the work called for in this Specification and indicated on the accompanying Drawings shall be carried on in conjunction with the continued operation of the existing building and shall be so arranged that its installation and operation will conform with and facilitate the early installation of work.

2. The Contractor shall bear the expense required to revise his work due to any failure to coordinate the installation of his work with that of the building's operation.

3. The Contractor shall be responsible for the distribution and information concerning his work as required for the prompt installation and coordination with other trades.

C. Accessibility and Clearances:

1. The Contractor shall inform himself fully regarding peculiarities and limitations of space for the installation of the materials and equipment under Division 2. He shall verify all dimensions and conditions in the field. No extra compensation will be allowed because of differences between actual dimensions and the sizes shown on the Drawings.

2. The Contractor shall see that equipment and apparatus necessary to be reached from time to time for operation and maintenance are made easily accessible.

3. Although the location of items may be shown on the Drawings in a specific place, the construction may disclose the fact that the location for this work does not make its position easily and quickly accessible. In such case, the Contractor shall call the Architect's attention to same before installing the work and shall be guided by the Architect's instruction.

1.04 PRELIMINARY WORK:

A. Before starting the work, make a thorough inspection of the work area to determine the physical condition of natural features and adjacent improvements to remain.

B. Provide complete mark out/tone out of existing utilities for coordination of proposed work. Repair any damage that occurs to existing utilities to remain at no additional cost to the owner.

C. Notify all authorities owning utility lines running to or on the property. Protect and maintain all utility lines that are to remain on the property and cap those that are not required in accordance with the instructions of the utility companies or local authorities having jurisdiction over them.

PART 2 - PRODUCTS

This part not used.

PART 3 – Execution

3.01 PROTECTION:

A. The Contractor shall effectively protect, at his expense, all materials and equipment, including his employees, during the period of construction, and he shall be held responsible for all damage done to his work, until the same is fully accepted by the Architect.

B. Provide protection necessary to prevent damage to existing building(s), concrete, pavement, utilities or vegetation indicated on the Contract Documents to remain. Box or otherwise protect from damage all trees, shrubs, lawns, etc. which are to be preserved. Trees shall be kept free from guy lines. Remove all protection when work is completed and when authorized to do so by the Architect.

C. Protect improvements on adjoining properties and on Owner's property.

D. Restore damaged improvements to original condition as acceptable to Architect and/or Owner.

E. Protect the property, adjoining properties, wetlands, etc. from damage by soil erosion by installing silt fences and hay bales or as indicated in the projects Storm Water Pollution Prevention Plan, if one is applicable.

F. Conduct site operations to ensure minimum interference with parking lots, roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct parking lots, streets, walks, or other occupied or used facilities without permission from the Owner and/or authorities having jurisdiction.

G. Provide traffic control as required, in accordance with the New York State Department of Transportation "Manual of Uniform Traffic Control Devices" and the local jurisdiction traffic safety requirements.

H. Streets, roadways, parking lots, etc. shall be thoroughly cleaned and/or swept on a daily basis.

3.02 CLEARING and GRUBBING:

A. Clear and grub in the areas of the proposed building, paved areas and/or site improvements in preparation for rough grading and new construction.

B. Completely remove all trees, shrubs, stumps, roots, vegetation, growth, paving, boulders, rocks, rubbish, and all other material interfering with the installation of new construction or not suitable for rough or finished grading, except trees or shrubs directed or indicated to remain.

C. Remove all roots 1" in diameter or larger. Remove all boulders and rocks larger than 3" in largest dimension.

D. Remove all topsoil, peat, and soils containing a high degree of organic matter. (Coordinate with Item 3.03 below)

E. Remove all soft clay soils and rubbish fills.

F. Excavation resulting from the removal of trees, roots, and the like shall be filled with suitable on-site material or imported fill as approved by the Architect/Engineer. Place fill material in horizontal layers not exceeding 8" loose depth, and thoroughly compacted per fill requirements.

3.03 STRIPPING and STOCKPILING EXISTING TOPSOIL:

A. Existing topsoil and sod on the site within area designated on the drawings shall be stripped to whatever depths encountered to prevent intermingling with underlying subsoil or other objectionable material. Cut heavy growths of grass from areas before stripping.

B. Free the topsoil of stones, roots, brush, rubbish, clay or other unsuitable materials/objects over 2″ in diameter, and remove the latter from the premises before stockpiling the topsoil.

C. Care shall be taken not to contaminate the topsoil with clay or other unsuitable materials and remove the latter from the premises before stockpiling the topsoil.

D. Stockpile topsoil in storage piles where indicated or permissible within site staging perimeter (coordinate with Architect and/or Construction Manager). Construct storage piles to freely drain surface water. Cover storage piles as required to prevent windblown dust. Excess topsoil shall be removed from the site by the Contractor unless specifically noted otherwise on the drawings.

E. Refer to soil erosion and sediment control drawing, if included, for additional details.

3.04 DEMOLITION:

A. Existing structures (where indicated), concrete and paving on the site (where indicated), including all existing/discovered inactive cesspools, cisterns, wells, foundation materials shall be completely demolished and all debris removed from the site. Excavation resulting from the removal sub-surface structures, foundations/footings shall be filled with suitable on-site material or imported fill as approved by the Architect/Engineer. Place fill material in horizontal layers not exceeding 8" loose depth, and thoroughly compacted per fill requirements.

B. Remove existing above grade and below grade improvements and abandoned underground piping or conduit as shown on the drawings or necessary to permit construction and other work.

C. All work shall be executed in such a manner as not to endanger the safety of the workmen or the public. All barriers and precautionary measures shall be erected as required.

3.05 REMOVAL and DISPOSAL:

A. Dispose of all debris resulting from the work of this section. Haul off site and dispose of legally.

B. Do not burn rubbish, organic matter, etc. on the site.

C. Do not bury concrete, rock, stumps/roots, etc. on the site.

END OF SECTION

DIVISION 2 - SITE WORK

SECTION 02200 - EARTH WORK

PART 1 - GENERAL

1.01 GENERAL

A. Applicable provisions of the "Conditions of the Contract" shall govern all work under this section.

B. Contractor must observe and adhere to New York Code, 6 NYCRR, Chapter IV and all applicable Subchapters and Parts for the receipt of, or removal, transport, tracking and disposal of all soils and construction waste and debris, as enforced by the New York State Department of Environmental Conservation. All fees associated with testing of materials and debris either at the point of origin (site) or point of termination, are to be borne by the Contractor.

C. Related Documents:

1. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and sections in Division 1 of these Specifications.

2. Specification Section 02000 - Site Work General Provisions.

3. Specification Section 02270 Sediment and Erosion control Procedures and Requirements

4. Specification Section 02400 Site Drainage Structures and Castings

5. Specification Section 02600 Hot Mix Asphalt Pavement

6. Specification Section 02601 Asphalt Overlay

7. Specification Section 02602 Asphalt Repair

8. Specification Section 03300 Cast In Place Concrete

9. Other Division 2 Site Work Sections related to the work of the Contract as applicable.

1.02 SCOPE/SUMMARY

A. Provide all labor, materials, equipment, and services and perform all operations required to complete the installation of all work of this section and related work as indicated on the drawings and specified herein, including, but not limited to, the following:

1. Erect and maintain barriers in accordance with all local municipal and state requirements.

2. Remove all obstructions in the way of new construction work which may be required in addition to clearing and removal work specified under Section 02000 – Site Work General Provisions.

3. Excavation and preparation of sub grade for building slabs, floor slabs, depressions and pits, foundations, interior and exterior column footings, walks, stairs, ramps, and pavements. All other excavation which may be required to complete the work and is not specified under other sections.

4. Shoring, sheathing, and pumping.

5. Backfilling all work within building lines to the required grades.

6. Granular fill course for support building slabs is included as part of this work.

7. Excavating and backfilling of trenches within building lines.

8. Excavating and backfilling for underground mechanical and electrical utilities and buried mechanical and electrical appurtenances, transformer pads, and conduits for same, underfloor utility lines, etc. inside or outside of the building footprint.

9. Filling and grading.

10. Finish grading of sub grade.

11. Finished grades.

B. Final grading, together with placement and preparation of topsoil for lawns and planting, is specified elsewhere in Division 2, Site Work Section.

1.03 DEFINITIONS

A. Excavation consists of removal of material encountered to subgrade elevations indicated or required by the work and subsequent disposal of materials removed. Materials to be excavated shall be non-classified and shall include all rock, earth, or other materials encountered in excavating and grading operations for building or site work. The contract price covers the removal of all such materials to the depth and extent indicated on the drawings specified herein or as required to perform the work.

B. Unauthorized excavation consists of removal of materials beyond required sub grade elevations or dimensions without specific direction of the Soils Engineer. Unauthorized excavation, as well as remedial work directed by the Soils Engineer, shall be at the Contractor's expense.

1. Under footings, foundation bases, or retaining walls, fill unauthorized excavation with compacted controlled structural fill material or by extending the indicated bottom elevation of the footing or base to the excavation bottom, without altering the required top elevation.

2. In locations other that those above, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Construction Manager (when applicable), Architect or the Soils Engineer.

C. Additional Excavation: When excavation has reached required subgrade elevations, notify the Architect/Engineer, who will make an inspection of conditions. If Architect/Engineer (based upon Soils Engineer's reports) determines that bearing materials at required subgrade elevations are unsuitable, continue excavation until suitable bearing materials are encountered and replace excavated material as directed by the Soils Engineer.

1. Removal of unidentified unsuitable materials and its replacement beyond the limits required for the construction work as directed will be paid on basis of Conditions of the Contract relative to changes in the work.

D. Sub grade: The undisturbed earth or the compacted soil layer immediately below granular subbase, drainage fill, or topsoil materials.

E. Fill is that material removed from excavations or imported from off site borrow areas, predominantly granular, non-expansive soils free from roots and other deleterious matter. Fill material is subject to approval.

F. Structure: Buildings, foundations, slabs, tanks, curbs, or other man-made stationary features occurring above or below ground surface.

1.04 SUBMITTALS

A. Test Reports: The Contractor shall submit the following reports directly to the Construction Manager (if applicable), the Owner, and the Architect:

1. Test reports on borrow material.

2. Verification of suitability of each footing subgrade material, in accordance with specified requirements including substantiation of and structural capacity of existing rock on which new footings are to bear.

3. Field reports; in-place soil density tests.

4. One optimum moisture-maximum density curve for each type of soil encountered.

5. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.

1.05 QUALITY ASSURANCE

A. Codes and Standards: Perform excavation work in compliance with applicable requirements of authorities having jurisdiction.

B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

C. Use equipment adequate in size, capacity, and numbers to accomplish the work of this section in a timely manner.

D. Engineering, Testing, and Inspection Services: The Contractor shall make arrangements for and the Owner shall pay for a qualified independent geotechnical testing laboratory and associated soil engineer (acceptable to the Owner) to perform soil survey and soil testing service for sampling and testing of materials proposed to be used as well as substantiation and verification of existing subsurface conditions when desired depths of excavation are reached. The Contractor will be responsible for all costs associated with failed tests resulting from their work.

E. Testing Laboratory Qualifications: To qualify for acceptance, the geotechnical testing laboratory and associated soils engineer must demonstrate to the Owner's satisfaction, based on evaluation of laboratory-submitted criteria conforming to ASTM E 699, that it has the experience and capability to conduct required field and laboratory geotechnical testing without delaying the progress of the work.

1.06 SOILS ENGINEER (SERVICES AS EMPLOYED AND PAID BY THE OWNER)

A. For site conditions without complex soil problems, a registered soils engineer shall be engaged to perform the following minimum services:

1. Examine on-site materials to determine suitability for use.

2. Recommend locations for placing on-site materials.

3. Recommendations for compacting on-site materials.

4. Determine suitability of soil under footings, foundations.

5. Perform compaction tests and supervise filling operations.

B. Soils engineer's services for problem site conditions shall include the above and the following additional work at minimum:

1. Determine extent of unsuitable material removal.

2. Testing of materials proposed for use from off-site and on-site sources.

3. Dewatering recommendations.

4. Supervising the placing and compacting of approved materials and under footings, foundations, slabs, utility lines, and paved areas.

5. Supervising environmental protection procedures as required by Federal, State, and Municipal Agencies.

NOTE: Copies of soils reports prepared by soils engineer are to be sent to the Owner, the Architect, and Construction Manager (if applicable).

1.07 PROJECT CONDITIONS

A. Site Information: Data in subsurface investigation reports were used for the basis of the design and are available to the Contractor for information only. Conditions are not intended as

representations or warranties of accuracy or continuity between soil borings. The Construction Manager, The Architect, and the Owner will not be responsible for interpretations or conclusions drawn from these data by the Contractor.

1. Additional test borings and other exploratory operations may be performed by the Contractor, at the Contractor's option; however, no change in the Contract Sum will be authorized for such additional exploration.

B. Examine the areas and conditions under which the work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

C. Set all lines, elevations, and grades for utility and drainage system work and control system for duration of work, including careful maintenance of bench marks, property corners, monuments, or other reference points.

D. Existing Utilities: Locate existing underground utilities in areas of excavation work. This work to be substantiated and paid by this Contractor. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations. If damaged, repair or replace at no additional cost to the Owner.

1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with the Owner, the Construction Manager (if applicable) and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

2. Do not interrupt existing utilities service facilities occupied by the School or others, during occupied hours, except when permitted in writing by Architect/Engineer and then only after acceptable temporary utility services have been provided.

3. Provide minimum 48-hour notice to the Construction Manager (when applicable), Architect, and Owner, and receive written notice to proceed before interrupting any utility.

4. If service is interrupted as a result of work under this section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.

5. If existing utilities are found to interfere with the permanent facilities being constructed under this section, immediately notify the Architect and secure his instructions.

6. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shutoff of services if lines are active.

E. Use of Explosives: Use of explosives is permitted for certain types of rock removal only but that use must be substantiated with the Owner, Architect/Engineer, State, and Local Agencies prior to bidding and again prior to commencement of work.

1. The use of explosives is only permitted when the Owner has been notified of same by written notice of the Contractor through Architect/Engineer, thereby permitting the Owner and its surrounding neighbors the required legal notices to vacate and/or protect their properties, buildings, homes, or premises as needed.

F. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.

1. Operate warning lights as recommended by authorities having jurisdiction.

2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

3. Provide all protective measures necessary for the safety of workmen. The above shall be carried out in accordance with and in compliance with regulations of local, county, federal, and OSHA authorities having jurisdiction over same. Protection is entirely the responsibility of the Contractor.

4. The work shall be executed so that no damage or injury will occur to the Owner's property or building, to public and adjoining or adjacent structures, streets, paving, sewers, gas, water, electric, or any other pipes. Should any damage or injury caused by the Contractor or anyone in his employ, or by the work under this Contract occur, the Contractor shall, at his expense, make good such damage and assume all responsibility for such injury.

5. The above shall also include the protection of all existing sewers and drainage systems to remain in use within the area affected by the work of this project.

6. Monuments, benchmarks, and other reference features on streets bounding this project shall be protected. Should these be disturbed in any manner, the Contractor shall have them replaced.

7. Use every means necessary to prevent dust from becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

8. Maintain access to adjacent areas at all times.

G. The Contractor is to acquaint himself with the existence and location of all surface and subsurface structures and utilities within the project area. He is not to damage any of those that are to remain, and he is to leave them accessible and make the necessary provisions by sheeting, hanging, supporting, or other means necessary to obtain this result, subject to the approval of Architect/Engineer, the local municipality, the utility company involved, and any other agencies having jurisdiction over this project.

H. Prior to entering his bid, the Contractor shall visit the site and familiarize himself with all existing conditions. All nearby

existing buildings and utilities shall be inspected by the Contractor prior to entering his bid.

I. Borings were prepared by others, and provided by the Owner. The Geotechnical Report contained herein shall be reviewed prior to bid. The documents are for information only. Contractor shall interpret for themselves the soil condition underlying the surface of the ground.

J. Perform excavation by hand within dripline of large trees to remain. Protect root systems from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with moistened burlap.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

A. Satisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups GW, GP, GM, SM, SW, and SP.

B. Unsatisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups CG, SC, ML, MH, CL, CH, OL, OH, and PT.

C. Granular Fill: Naturally or artificially graded mixture or natural or crushed gravel, crushed stone, crushed slag, and natural or crushed sand meeting requirements for New York State Department of Transportation Standard Specification 304.2.02, Type 4 unless otherwise indicated.

D. Subbase Material: Graded mixture of crushed rock, with 100 percent passing a 2-inch sieve and meeting requirements for New York State Department of Transportation Standard Specification 3.04-2.02, Type 2, unless otherwise indicated.

E. Backfill and Fill Materials: Satisfactory non-expansive soil materials free of organic material, roots, other deleterious substances, clay, rock or gravel larger than 2 inches in any dimension, debris, waste and frozen materials.

2.02 CONTROLLED STRUCTURAL FILL OR MATERIAL

A. Imported controlled structural fill shall consist of inert material that is hard, durable stone and coarse sand, practically free from silts, clay, frozen sections, and foreign substances. It may consist of either natural or washed soil and must be free of organics. The material shall be a well graded mixture, shall have no material larger than 4", and must have the following gradations by weight:

Maximum retained on 3/4-inch sieve:	30%.
Maximum retained on No. 4 sieve:	50%.
Maximum passing 100 sieve:	25%.
Maximum passing 200 sieve:	5%.

This grading shall be determined in accordance with ASTM Standard Specification C117 and C136.

2.03 SUB BASE FILL OR MATERIAL

A. Sub base fill shall consist of inert material that is clean, hard, durable stone, sand, and non-plastic silt completely free from clays, frozen sections, and foreign substances. It may consist of either natural or washed soil and must be free of organics. The sub base fill shall be a well graded mixture, shall have material not larger than 2 inches, and must comply with the following grain size gradation by weight:

Maximum passing No. 100 sieve: 35%.
Maximum passing No. 200 sieve: 25%.

This grading shall be determined in accordance with ASTM Standard Specification C117 and C136.

2.04 WEED KILLER

A. Provide a dry, free-flowing, dust-free chemical compound, soluble in water, capable of inhibiting growth of vegetation, and approved for use on this work by governmental agencies having jurisdiction.

2.05 TOPSOIL

A. Where and if shown on the drawings or otherwise required, provide topsoil consisting of friable, fertile soil of loamy character, containing an amount of organic matter normal to the region, capable of sustaining healthy plant life, and reasonably free from subsoil, roots, heavy or stiff clay, stones, noxious weeds, sticks, brush, litter, and other deleterious matter.

B. Obtain topsoil from sources within the project limits, or provide imported topsoil obtained from sources outside the project limits, or from both sources.

2.06 OTHER MATERIALS

A. Provide other materials, not specifically described, but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.01 EXCAVATION

A. Excavation Classifications: The following classifications of excavation will be made when rock is encountered:

1. Earth Excavation includes excavation of pavements and other obstructions visible on surface; underground structures, utilities, and other items indicated to be demolished and removed; together with earth and other materials encountered that are not classified as rock or unauthorized excavation.

2. Rock excavation for trenches and pits includes removal and disposal of materials and obstructions encountered that cannot be excavated with a track-mounted power excavator, equivalent to Caterpillar Model No. 215C LC, and rated at not less than 115 HP flywheel power and 32,000-pound drawbar pull and equipped with a short stick and a 42-inch wide, short tip radius rock bucket rated at 0.81 cubic yard (heaped)

capacity.

3. Trenches in excess of 10 feet in width and pits in excess of 30 feet in either length or width are classified as open excavation.

4. Rock excavation in open excavations includes removal and disposal of materials and obstructions encountered that cannot be dislodged and excavated with modern, track-mounted, heavy-duty excavating equipment without drilling, blasting, or ripping. Rock excavation equipment is defined as Caterpillar Model No. 973 or equivalent track-mounted loader, rated at not less than 210 HP flywheel power and developing minimum of 45,000 pound breakout force (measured in accordance with SAE J732).

   a. Typical materials classified as rock are boulders 1/2 cu. yd. or more in volume, solid rock, rock in ledges, and rock-hard cementitious aggregate deposits.

   b. Intermittent drilling, blasting, or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation.

5. Rock Excavation:

   a. In the event that rock is encountered and is of a type that cannot be broken up and excavated by machine or moved into deep fill areas, blast as necessary, and remove and dispose of same off site.

   b. Rock that can be broken up, excavated by machine, and/or moved into deep fill areas shall be reduced to a size not exceeding 6" prior to depositing in deep fill areas.

   c. Definition: Whenever the word "removal" is used in connection with rock, it is to be construed to mean "blasting, excavating, and the removal of rock that cannot be broken up by machine and removed", as defined previously.

      1. As this facility is in session daily Monday through Friday and its surrounding neighbors are contiguous, the preferred methodology of excavation and removal of rock is to be construed as "passive" in nature--meaning "drilling or any other passive means". The excavation contractor shall coordinate his/her work with the Owner’s representative so as to perform that work with the least disruption to the Owner and the Owner's neighbors and with maximum intent to the safety of same. The preferred time of rock removal work shall take place when the Owner's facilities are vacated, thereby meaning after the close of school each day or on weekends, as long as these times are permitted by all State and Local Ordinances and are acceptable and coordinated with the School and its neighbors.

d. Blasting shall conform strictly to all local and state laws, rules, and regulations applying thereto, and shall avoid excess noise and vibration. Steel mats shall be provided where necessary to prevent damage from flying fragments. Drill holes shall not be carried any further than necessary to remove the rock desired. The care, handling, and storing of explosives shall conform strictly to all local and state laws, rules, and regulations applying thereto. After concrete is set in place, no blasting shall be done except with the written permission of the Owner, and Architect.

e. The Contractor may consider the utilization of "Super Bristar 2000", a non-explosive demolition agent as a means of rock removal for this project.

f. General:

1. Blasting shall be done as necessary for breaking rock for removal to depths, limits, and extent required for the construction of the building, site grading, and utility lines.

2. Blasting shall be performed only by experienced, competent, licensed personnel under the direct supervision of an experienced, competent, licensed foreman.

g. Precautions:

1. Blasting shall be permitted only when proper and adequate precautions have been taken for the protection of personnel, work, and property.

2. Caps, fuses, and other exploders shall in no case be stored in the same place in which explosives are stored.

3. All operations involving delivery, handling, storage, and the use of explosives shall be conducted in accordance with applicable laws, statutes, and regulations of the State, Municipal, or other governing bodies having jurisdiction. Likewise, the blasting contractor shall secure and pay for all necessary permits on behalf of the excavation contractor/contractor and shall provide same to the Owner, and Architect prior to scheduling the work. Open rock and rock in trenches shall be removed to a depth of 8" below required grades.

h. Do not perform rock excavation work until material to be excavated has been cross sectioned and classified by the Contractor's qualified independent geotechnical testing laboratory and associated soils engineer (employed and paid by the Contractor), and as approved by Architect/Engineer.

i. Rock payment lines are limited to the following:

1. Three feet outside of concrete work for which forms are required, except footings.

2. Two feet outside perimeter of footings.

3. In pipe trenches, 6 inches below invert elevation of pipe and 2 feet wider than inside diameter of pipe, but not less than 3 feet minimum trench width.

4. Outside dimensions of concrete work where no forms are required.

5. To bottom of all footings which, as designed, are minimum 1'-8" below finished floor and are to bear on undisturbed rock of 8 T.S.F. bearing capacity minimum. This capacity to be verified by Contractor's geotechnical testing laboratory and associated soils engineer.

6. Under slabs on grade, 6 inches below bottom of concrete slab.

7. Work indicated herein under these rock payment lines is part of this Contractor's base bid.

3.02 STABILITY OF EXCAVATIONS

A. General: Comply with local codes, ordinances, and requirements of agencies having jurisdiction.

B. The Contractor shall safely support and maintain adjacent and abutting property and structures and shall maintain the work safe to life, limb, and property.

C. Barriers, sheet piling, bracing, and the like shall be installed where required to maintain the excavation and the banks in a safe and stable condition.

D. Provide sheeting and bracing, when necessary, in trenches and other excavations where protection of workmen is required. Sheeting may be removed after sufficient backfilling to protect against damaging or injurious caving.

E. Slope sides of excavations to 1:1 or flatter or to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

F. Shoring and bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross braces, in good serviceable condition. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Extend shoring and bracing as excavation progresses.

G. All temporary sheet piling, bracing, shoring, and other protective work shall be removed after the necessity for same ceases to exist, in the opinion of the Architect, and before backfilling.

H. All work removed or damaged through the installation or removal of the temporary protective work or through improper protection work shall be replaced or repaired in an approved manner at no cost to the Owner.

I. Maintain excavations free from detrimental quantities of leaves, sticks, trash, and other debris until completion of the work.

3.03 DEWATERING

A. Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding area.

1. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.

2. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.

B. Surrounding soil shall not be disturbed or removed during pumping operations.

C. Water shall be disposed of by pumping to a point directed by the Architect without damage to adjacent property.

D. The Contractor shall provide, operate, and maintain adequate equipment to keep the excavations free from water so that the excavating, concrete work, membrane waterproofing, and all other work in the excavations will be performed in the dry.

E. Excavate and backfill in a manner and sequence that will provide proper drainage at all times.

3.04 STORAGE OF EXCAVATED MATERIALS

A. Stockpile excavated materials acceptable for backfill and fill where directed. Place, grade, and shape stockpiles for proper drainage.

1. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.

2. Dispose of excess excavated soil material and materials not acceptable for use as backfill or fill.

3.05 EXCAVATION FOR STRUCTURES

A. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 foot, and extending a sufficient distance from

footings and foundations to permit placing and removal of concrete formwork, installation of services, and other construction and for inspection.

B. Contractor shall prepare building and sidewalk areas to underside of floor slab plus or minus 1/2". Under no circumstances shall any material other than approved on-site material, or specified imported controlled structural fill be used for filling within a depth of 10" inches below building and sidewalk slabs on grade or within a depth of 12" beneath all column or wall support footings. Imported controlled structural fill shall also be utilized in all areas supporting earthen or other load carrying structures where organic soil materials are encountered subsequent to the removal of said organic soil materials.

C. Excavations for footings and foundations: Take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work. Piers, concrete slabs, and footings shall be benched a minimum of 2" into rock at sloping rock conditions as indicated on the drawings where no excavation is required.

D. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Structures: Conform to elevations and dimensions indicated within a tolerance of plus or minus 0.10 foot; plus a sufficient distance to permit placing and removal of concrete formwork, installation of services, and other construction, and for inspection. Do not disturb bottom of excavations intended for bearing surface.

E. Unsuitable Material: All unsuitable material below the grading plane shall be excavated and removed and the space filled with granular material as specified herein.

1. Unsuitable materials are those soils that exhibit characteristics that make them unsuitable for the direct support of the pavement structure, such as organic silt, elastic clays and silts, topsoil, frost susceptible soils, etc. Unsuitable materials shall be removed to the depth directed by the Soils Engineer and the Construction Manager when applicable.

2. The excavation and disposal of unidentified unsuitable material below the grading plane shall be paid on the basis of the Conditions of the Contract relative to Changes in the Work.

3. The granular fill material will be used in the fill sections within the paving area. No additional payment will be made for placing this material in the fill areas.

F. Unsuitable material will be legally disposed of off site.

3.06 EXCAVATION FOR PAVEMENTS, SLOPES, DITCHES, ETC.

A. The work under this item shall consist of the following in accordance with the plans, specifications, addenda, bid proposal, and requirements herein: excavating for pavement, slopes, ditches, and all other work incidental to the excavation for the pavement, including disposing of unsuitable and surplus material, preparing

the subgrade, compaction, grading, slopes and shoulders, and all other work needed to complete the item.

B. Cut surface under pavements to comply with cross sections, elevations, and grades as indicated.

D. Drainage and Site Maintenance: During construction, the site shall be maintained in such condition that it will be adequately drained at all times.

E. Unsuitable Material: All unsuitable material below the grading plane shall be excavated and removed and the space filled with granular material as specified herein.

1. Unsuitable materials are those soils that exhibit characteristics that make them unsuitable for the direct support of the pavement structure, such as organic silt, elastic clays and silts, topsoil, frost susceptible soils, etc. Unsuitable materials shall be removed to the depth directed by the Soils Engineer and the Construction Manager when applicable.

2. The excavation and disposal of unidentified unsuitable material below the grading plane shall be paid on the basis of the Conditions of the Contract relative to Changes in the Work.

3. The granular fill material will be used in the fill sections within the paving area. No additional payment will be made for placing this material in the fill areas.

F. Unsuitable material will be legally disposed of off site.

G. The Contractor shall store topsoil, embankment soils, and other materials, and/or to excavate beyond the limits of the contract and slope easements. The cost of stockpiling and rehandling shall be included in his base bid price.

H. All soils that are classed as suitable for the direct support of the pavement (non-organic and non-frost susceptible soils) shall be scarified to a loose depth of ten (10) inches and recompacted to 95% of the maximum density at the optimum moisture content of the soils determined by ASTM D-1557. The moisture content at the time of compaction shall not be greater than one (1) percent nor less than two (2) percent by weight of dry soil of the optimum moisture content. Dry soils shall be moistened and thoroughly mixed to the required moisture content. Wet soils shall be dried by aerating the required moisture content.

1. The cost of adding moisture, drying, and compaction shall be included in the Contractor's base bid price.

I. Subgrade in excavated areas for new pavement shall be compacted to the density specified below. Soils not conforming to this density shall be scarified or loosened to a depth of ten (10) inches, water added in the amount necessary, and the material recompacted to provide the required density.

1. Compaction control will be provided as follows: The subgrade in excavated areas shall be compacted to at least ninety-

five (95) percent of the maximum density as determined by the "Test for Moisture Density Relations of Soils using a 10 lb. Rammer and 18 inch Drop", ASTM D-1557 as currently revised. Samples of subgrade materials for testing purposed shall be taken at frequent intervals daily. From these tests, corrections and changes in moisture content will be made and compaction continued until required densities are achieved.

J. The Contractor shall check the work under this Item with templates, slope boards, or other devices satisfactory to the Soils Engineer. The completed work shall conform to the plans within the following tolerances.

K. For pavement subgrade, the surface shall vary no more than three-quarter (¾) inch from a ten (10) foot straight edge applied to the surface, and the actual grade of the subgrade shall not vary more than one (1) inch from plan elevation.

3.07 TRENCH EXCAVATION FOR PIPES AND CONDUIT

A. Excavate trenches to uniform width, sufficient wide to provide ample working room and a minimum of 6 to 9 inches of clearance on both side of pipe or conduit.

B. Accurately cut trenches for pipe or conduit that is to be installed to designed elevations and grades to line and grade from 4" below bottom of pipe and to width as specified. Place 4" of bedding material, compact in bottom of trench, and accurately shape to conform to lower portion of pipe barrel. After pipe installation, place select backfill and compact in maximum 6" layers measured loose to the top of the trench.

C. Excavate trenches and conduit to a depth indicated or required to establish indicated slope and invert elevations and to support bottom of pipe or conduit on undisturbed soil. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost lines.

1. Where rock is encountered, carry excavation 6" below required elevation and backfill with a 6" layer of crushed stone or gravel prior to installation of pipe.

2. For pipes or conduit less than 6" in nominal size, and for flat-bottomed, multiple-duct conduit units, do not excavate beyond indicated depths. Hand-excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.

3. For pipes and equipment 6 inches or larger in nominal size, shape bottom of trench to fit bottom of pipe for 90° (bottom 1/4 of the circumference). Fill depressions with tamped sand backfill. At each pipe joint, dig bell holes to relieve pipe bell of loads ensuring continuous bearing of pipe barrel on bearing surface.

4. Where it becomes necessary to excavate beyond the limits of normal excavation lines in order to remove boulders or other interfering objects, backfill the voids remaining after removal of the objects.

5. When the void is below the sub-grade for the utility bedding, use suitable earth materials and compact to the relative

density of 95 percent (in accordance with ASTM D698).

6. When the void is in the side of the utility trench or open cut, use suitable earth or sand compacted or consolidated to a relative density of 92 percent (in accordance with ASTM D1557).

7. Remove boulders and other interfering objects, and backfill voids left by such removals, at no additional cost to the Owner.

D. The local utility companies shall be contacted before excavation shall begin. Dig trench at proper width and depth for laying pipe, conduit, or cable. Cut trench banks as nearly vertical as practical and remove stones as necessary to avoid point-bearing. Over excavate wet or unstable soil, if encountered, from trench bottom as necessary to provide suitable base for continuous uniform bedding.

E. All trench excavation side walls greater than 5 feet in depth shall be sloped, shored, sheeted, braced, or otherwise supported by means of the sufficient strength to protect the workmen within them in accordance with the applicable rules and regulations established for construction by the Department of Labor, Occupational Safety and Health Administration (OSHA), and by local ordinances. Lateral travel distance to an exit ladder or steps shall not be greater than 25 feet in trenches 4 feet or deeper.

F. Accurately grade trench bottom to provide uniform bearing and support for each section of pipe on bedding material at every point along entire length, except where necessary to excavate for bell holes, proper sealing of pipe joints, or other required connections. Dig bell holes and depressions for joints after trench bottom has been graded. Dig no deeper, longer, or wider than needed to make joint connection properly.

G. Trench width requirements below the top of the pipe shall not be less than 12" nor more than 18" wider than outside surface of any pipe or conduit that is to be installed to designated elevations and grades. All other trench width requirements for pipe, conduit, or cable shall be at least practical width that will allow for proper compaction of trench backfill.

H. Trench depth requirements measured from finished grade or paved surface shall meet the following requirements or applicable codes and ordinances:

1. Water mains: 50" to top of pipe barrel.

2. Sanitary Sewer: Elevations and grades as indicated on drawings (48" minimum cover).

3. Storm Sewer: Depths, elevations, and grades as shown on drawings.

4. Electrical Conduits: 30" minimum to top of conduit or as required by NEC 300-5, NEC 710-36 codes, or the local utility company requirements, whichever is deeper.

5. TV Conduits: 18" minimum to top of conduit or as required by the local utility company, whichever is deeper.

6. Telephone Conduits: 30" minimum to top of conduit, or as required by the local utility company, whichever is deeper.

7. Gas Mains and Service: 30" minimum to top of pipe, or as required by the local utility company, whichever is deeper.

8. Where utilities are under a concrete structure slab or pavement, the minimum depth need only be sufficient to completely encase the conduit or pipe sleeve, and electrical long-radius rigid metal conduit riser, provided it will not interfere with the structural integrity of the slab or pavement.

9. Where the minimum cover is not provided, encase the pipes in concrete as indicated. Provide concrete with a minimum 28-day compressive strength of 2,500 psi.

I. Excavating for Appurtenances:

1. Excavate for manholes and similar structures to a distance sufficient to leave at least 12" clear between outer surfaces and the embankment or shoring that may be used to hold and protect the banks.

2. Over-depth excavation beyond such appurtenances that has not been directed will be considered unauthorized. Fill with sand, gravel, or lean concrete at no additional cost to the Owner.

3. Dig bell holes and depressions for joints after the trench has been graded. Provide uniform bearing for the pipe on prepared bottom of the trench.

3.08 COLD WEATHER PROTECTION

A. Protect excavation bottoms against freezing when atmospheric temperature is less than 35°F.

3.09 BACKFILL AND FILL

A. All excavations shall be backfilled as promptly as the work permits but not before concrete has attained its full design strength and not until completion of the following:

1. Acceptance of construction below finish grade, including, where applicable, damp-proofing and water-proofing.

2. Inspecting, testing, approving, and recording locations of underground utilities.

3. Removing concrete formwork.

4. Removing shoring and bracing, and backfilling of voids with satisfactory materials.

5. Removing trash and debris within excavated areas.

6. Placement of horizontal bracing on horizontally supported walls.

B. No frozen material shall be used. Backfill shall be placed in uniform horizontal layers of approximately 8" in depth. Each layer shall be moistened during compaction. Compaction shall be done in a manner approved by the Architect and shall be continued until fill is solid and no settlement will occur.

C. When sheeting, shoring, and bracing is removed, all voids shall be filled with sound materials and thoroughly tamped.

D. Backfill operations shall be made to the new surface grades as shown on the drawings.

E. No backfill shall be placed covering other work until after such work has been inspected and approved. Any backfilling placed on earth that has caved in and covered other work before same has been inspected and approved shall be removed when so directed.

F. Excess material, if any, and all rubbish shall be removed from the site or otherwise disposed of as may be directed by the Architect.

G. General: Place soil material in layers to required subgrade elevations, for each area classification listed below, using materials specified herein.

1. Under grassed areas, use satisfactory excavated or borrow material.

2. Under walk sand pavements, use subbase material.

3. Under steps, use subbase material.

4. Under foundations, use controlled structural fill material.

5. Under building slabs, use granular material or on site sub grade material if determined acceptable by the Architect or Soils Engineer.

6. Under piping, conduit, and equipment, use subbase materials where required over rock bearing surface unless otherwise indicated. Shape excavation bottom to fit bottom 90° of cylinder.

3.10 CONTROLLED STRUCTURAL FILL OR MATERIAL

A. Location: Imported controlled structural fill shall be used when necessary to provide proper soil bearing capacity:

1. Under all proposed buildings and sidewalks and at least 5 feet beyond the limits of the proposed buildings to a depth as required by foundation design where sidewalks are not part of the scope of building work.

2. Under all footings (continuous or spread) to a depth of at least 12 inches, or as required by foundation design.

3. For all load carrying structures which are situated in areas of soft organic soil deposits subsequent to the removal of said soft organic soil deposits.

4. Sand shall be used as bedding for all drainage and sewerage utilities, unless groundwater problems are encountered or anticipated that may require the use of crushed stone.

3.11 SUB BASE FILL OR MATERIAL

A. Location: The subbase fill may be used in all fill areas where controlled structural fills specified for buildings are not required due to soil conditions, as long as the requirements listed in Section 2.03A are met. Under no circumstances shall subbase material be in directed contact with structural support component, or in support of any of the proposed utilities.

B. Backfill trenches with concrete where trench excavations pass with 18" of column or wall footings and that are carried below bottom of such footings or that pass under wall footings. Place concrete to level of bottom of adjacent footing.

1. Concrete is specified in Division 3.

2. Do not backfill trenches until test and inspections have been made and backfilling is authorized by Contracting Officer. Use care in backfilling to avoid damage or displacement of pipe systems.

C. Provide 4" thick concrete base slab support for piping or conduit less than 2'-6" below surface of roadways. After installation and testing of piping or conduit, provide minimum 4" thick encasement (sides and top) of concrete prior to backfilling or placement of roadway subbase.

D. Backfill excavations as promptly as work permits, but not until completion of the following:

1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.

2. Inspection testing, approval, and recording locations of underground utilities have been performed and recorded.

3. Removal of concrete formwork.

4. Removal of shoring and bracing and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities or leave in place if required.

5. Removal of trash and debris from excavation.

6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.

3.12 PLACEMENT AND COMPACTION

A. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.

1. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.

B. Place backfill and fill materials in layers not more than 8" in loose depth for material compacted by heavy compaction equipment, and not more than 4" in loose depth for material compacted by hand operated tampers.

C. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

D. Place backfill and fill materials evenly adjacent to structure, piping or conduit to required elevations. Prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping, or conduit to approximately same elevation in each lift.

E. Where the construction includes basement or other underground walls having structural floors over them, do not backfill such walls until the structural floors are in place and have attained sufficient strength to support the walls.

F. Control soil and fill compaction, providing minimum percentage of density specified for each area classification indicated below. Correct improperly compacted areas or lifts as directed if soil density test indicate inadequate compaction.

1. Percentage of Maximum Dry Density Requirements: Compact soil to not less than the following percentages of maximum dry density, in accordance with ASTM D 1557 (Modified Proctor):

a. Under footings, compact subgrade and subbase material to at least 95% maximum dry density.

b. Under structures, building slabs and steps, and pavements, compact top 12″ of subgrade and each layer of backfill or fill material to at least 95% maximum dry density.

c. Under lawn or unpaved areas, compact top 6" of subgrade and each layer of backfill or fill material to a

MAXIMUM of 85% maximum dry density.

d. Under synthetic turf, compact top 6" of subgrade and each layer of backfill or fill material to at least 90% maximum dry density.

e. Under walkways, compact top 6" of subgrade and each layer of backfill or fill material to at least 95% maximum dry density.

G. Moisture Control:

1. Where subgrade or layer of soil material must be moisture-conditioned before compacting, uniformly apply water to surface during or subsequent to compacting operations.

2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compacting to the specified density.

3. Soil material that has been removed because it is too wet to permit compacting may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value as determined by moisture-density relation tests.

3.13 FILLING AND BACKFILLING

A. Filling and backfilling work shall include, but is not limited to, the following:

1. Contractor shall place and compact bank-run sand and gravel from approved imported sources consisting of clean bank-run gravel or sandy gravel, free from organic material, loam, wood, trash, snow, ice, and other objectionable material, well graded within the following limits:

Maximum retained on 3/4" sieve:	30%.
Maximum retained on No. 4 sieve:	50%.
Maximum passing 100 sieve:	25-30%.
Maximum passing 200 sieve:	5%.

No material larger than 2-1/2" to 4" sieve size by weight. When available, on-site material may be used in place of imported controlled structural fill with the Soils Engineer's approval.

2. Compaction of bank-run gravel under footings, foundation, under slabs on grade, and in building areas shall be to 95% of maximum density in accordance with ASTM Test Designation D1557.

3. Granular material where required under footings and foundations shall conform to material and gradations previously specified and shall be determined in accordance with ASTM Standard Specifications C117 and C136.

4. Filling--Imported Controlled Structural Fill: Compaction of the controlled imported structural fill shall be performed at a moisture content 3% drier than optimum as determined in the lab. It shall be placed in uniform layers not exceeding 10 and/or 12 inches thick after compaction. Each lift shall be compacted to not less than 95% of the maximum dry density determined within the lab as modified proctor density and shall be monitored by the soils engineer using the applicable ASTM standard for testing. Each lift shall have a minimum of 2 feet density test per 500 square yards, one located in the area of the propose column and the second located under a continuous wall footing. More frequent testing may be required at the discretion of the Soils Engineer based on the extent of filling on any given day or should any area become suspect.

5. Filling--Subbase Fill: Compaction of all subbase fill, either imported or on-site, shall be compacted at a moisture content 1-1.5% drier than optimum as determined in the lab. The subbase fill shall be placed in uniform layers not exceeding 8 inches in depth when uncompacted. Each lift shall be compacted to not less than 95% of its maximum dry density determined in the lab as modified standard for testing. At least two field density test shall be performed per lift within the area being filled on any given day beneath buildings provided the lift areas do not exceed 500 square yards.

3.14 TRENCH BACKFILLING

A. Criteria: Trenches shall not be backfilled until required tests are performed and the utility systems comply with and are accepted by applicable governing authorities. Backfill trenches as specified. If improperly backfilled, reopen to depth required to obtain proper compaction. Backfill and compact, as specified, to properly correct condition in an acceptable manner.

B. Backfilling: After pipe or conduit has been installed, bedded, and tested as specified, backfill trench or structure excavation with specified material placed in 8" maximum loose lifts. Compact to minimum density of 95 percent of optimum density in accordance with ASTM D698 (or 92 percent of optimum density in accordance with ASTM D1557).

C. Compaction: Exercise proper caution when compacting immediately over top of pipes or conduits. Water jetting or flooding is not permitted as method of compaction.

D. Compaction Testing: Independent testing laboratory shall perform test at intervals not exceeding 200'-0" of trench for the first and every other 8" lift of compacted trench backfill and furnish copies of test results as specified.

3.15 MATERIALS FOR FILL UNDER CONCRETE SLABS ON GRADE

A. Contractor is to establish building pad at underside of floor slab, plus or minus 1/2".

B. Prior to placing fill fine grading materials on building pad, existing pad fill shall be leveled and recompacted.

C. Fill materials under concrete slabs on-grade in building areas, under sidewalks, pads, concrete aprons, etc., are to be the sieve analysis previously shown for controlled structural fill.

D. Compaction of fill shall be as previously set forth. When compacting fill with mechanical compactor against foundation walls, pits, loading dock, etc., Contractor shall provide complete protection against damage to said installations.

E. There is to be a layer of no less than 6" of clean suitable bank run sand fill below all slabs on grade. On site material may be acceptable and its usability is to be verified via soils reports. The Contractor's bid is to be based on the use of on site material for use under slabs unless indicated otherwise within the Construction Documents.

F. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material. Apply water in minimum, quantity as necessary to prevent free water from appearing on surface during or subsequent to compaction operations.

1. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

2. Stockpile or spread soil material that has been removed because it is too wet to permit compaction. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value.

3.16 GRADING

A. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated or between such points and existing grades.

B. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes and as follows:

1. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10 foot above or below required subgrade elevations.

2. Walks: Shape surface of areas under walks to line, grade, and cross section, with finish surface not more than 1/2" above or below required subgrade elevation.

3. Shape the surface or areas scheduled to be under pavement to line, grade, and cross section, with finished surface not more than 0.05 feet above or below the required subgrade elevation.

C. Grading Surface or Fill under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2" when tested with a 10-foot straight edge.

D. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

3.17 PAVEMENT SUB BASE COURSE

A. General: Subbase course consist of placing subbase material, in layers of specified thickness, over subgrade surface to support a pavement base course.

1. Refer to other Division 2 sections for paving specifications.

B. Grade Control: During construction, maintain lines and grades including crown and cross-slope of subbase course.

C. Shoulders: Place shoulders along edges of subbase course to prevent lateral movement. Construct shoulders of acceptable soil materials, placed in such quantity to compact to thickness of each subbase course layer. Compact and roll at least a 12-inch width of shoulder simultaneously with the compaction and rolling of each layer of subbase course.

D. Placing: Place sub base course material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting subbase material during placement operations.

1. When a compacted subbase course is indicated to be 6" thick or less, place material in a single layer. When indicated to be more than 6" thick, place material in equal layers, except no single layer more than 6" or less than 3" in thickness when compacted.

3.18 FOOTING AND BUILDING SLAB SUB BASE COURSE

A. General: Subbase course consists of placement of subbase material, in layers of indicated thickness, over subgrade surface and/or granular fill to support concrete building slabs as indicated on drawings.

B. Placing: Place material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting material during placement operations.

1. When a compacted subbase course is indicated to be 6" thick or less, place material in a single layer. When indicated to be more than 6" thick, place material in equal layers, except no single layer more than 6" or less than 3" in thickness when compacted.

3.19 FIELD QUALITY CONTROL

A. Quality Control Testing During Construction: Allow testing service and the Construction Manager (when applicable) to inspect and approve each subgrade and fill layer before further backfill and construction work is performed.

1. Perform field density tests in accordance with ASTM D 1556 (sand cone method) or ATM D 2167 (rubber balloon method), as applicable.

2. Field density tests may also be performed by the nuclear method in accordance with ASTM D 2922, providing that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. In conjunction with each density calibration check, check the calibration curves furnished with the moisture gauges in accordance with ASTM D3017.

   a. If field tests are performed using nuclear methods, make calibration checks of both density and moisture gauges at beginning of work, on each different type of material encountered, and at intervals as directed by the Contracting Officer.

3. Footing Subgrade: Per each stratum of soil on which footings will be placed, perform at least one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested stratum when acceptable to the Construction Manager (if applicable) and the Architect.

4. Paved Areas and Building Slab Subgrade: Perform at least one field density test of subgrade for every 2,000 sq. ft. of paved area or building slab, but in no case fewer than three tests. In each compacted fill layer, perform one field density test for every 2,000 sq. ft. of overlaying building slab or paved area, but in no case fewer than three tests.

5. Foundation Wall Backfill: Perform at least two field density tests at locations and elevations as directed.

6. If it is determined by the Construction Manager (if applicable), the Architect, the Owner, and/or Independent geotechnical testing laboratory and associated soils engineer, based on testing service reports and inspection, subgrade or fills that have been placed are below specified density, perform additional compaction and testing until specified density is obtained.

3.20 EROSION CONTROL

A. Provide erosion control methods in accordance with requirements of authorities having jurisdiction or if the project is of sufficient size to require one, refer to the Storm Water Prevention and Protection Plan included elsewhere herein.

3.21 MAINTENANCE

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

B. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.

C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

D. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn, or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.22 CERTIFICATION

A. Upon completion of this portion of the work, and as a condition of its acceptance, deliver to the Architect a written report from a soil engineer certifying that the compaction requirements have been obtained and the type or classification of fill material placed.

3.23 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. All rubbish and other excavated material, which in the opinion of the Architect is not suitable for fill or grading, shall be removed and legally disposed of away from the premises.

B. Approved excavated material shall be spread on the site in locations as directed by the Architect.

C. Excavated material in excess of that required for all filling, backfilling, and rough grading shall become the property of the Contractor and shall be removed from the premises and legally disposed of.

D. Removal from the School's Property: Remove waste materials, including unacceptable excavated material, trash, and debris, and dispose of it off the School's property.

END OF SECTION

DIVISION 2 – SITE WORK

SECTION 02530 – ATHLETIC COURT SURFACING
Acrylic Tennis & Recreational Sport Surfaces

Masters Gel and Gel Plus Systems Specification

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope: This guideline specification covers the installation of the Laykold Masters Gel and Gel Plus systems. Advanced Polymer Technology Corporation of Harmony, Pennsylvania, U.S.A provides technical data and guideline specifications only. Consult with a professional engineer or architect for a formal specification. The Laykold Masters Gel and Gel Plus systems are resilient, polyurethane/acrylic composite systems utilizing a full-pour polyurethane monolithic shock pad with a highly flexible acrylic color finish. These systems increase player comfort by significantly reducing shock to the back and lower extremities. The Laykold Masters Gel and Gel Plus systems should be applied only to properly prepared concrete or asphalt substrates. These two premium performance cushioned court surfaces are comprised of LM PU Primer or Laykold VTB Primer (concrete only), Laykold Basecoat (asphalt only), LM Gel, 0.5-1.5 Black Spray Rubber (Gel Plus only), LM Wearcoat, LM Bond-Kote, LM Filler, and LM Topcoat.

B. Court Construction: Refer to the American Sports Builders Association (ASBA) manual Tennis Courts: A Construction & Maintenance Manual for court construction details. This publication may be obtained by calling the ASBA at 443-640-1042 or visiting www.sportsbuilders.org.

1.2 QUALITY ASSURANCE

A. All tennis court surfacing materials shall be Laykold Masters Gel and Gel Plus System as supplied by Advanced Polymer Technology (APT) of Harmony, PA, an ISO 9001 and ISO 14001 certified manufacturer. APT may be contacted via telephone 888-266-4221, fax 724-452-1703, or web sites www.laykold.com and www.advpolytech.com.

B. All work shall be done in accordance with American Sports Builders Association (ASBA) guidelines.

C. The contractor shall record the batch number of each product used on the site and maintain it throughout the warranty period.

D. The contractor shall provide the inspector, upon request, an estimate of the volume of each product to be used on the site.

E. Installation must be performed by a manufacturer trained and authorized LM Dealer.

1.3 SUBMITTALS

A. Submit one set of Advanced Polymer Technology "Laykold Masters Gel Specification" or "Laykold Masters Gel Plus Specification".

B. Submit system components Technical Data Sheets (TDS) and one Laykold Color Chart.

C. Submit current Safety Data Sheets (SDS).

D. Submit current ISO Quality Management System Certification certificate.

1.4 WORKING CONDITIONS & LIMITATIONS

A. Asphalt shall be allowed to cure a minimum of 14 days and concrete substrates shall be allowed to cure a minimum of 30 days before application of any coatings.

B. The substrate shall be CLEAN and DRY before coatings are applied. The surface of the substrate shall be inspected and made sure to be free of grease, oil, dust, dirt and other foreign matter before any coatings are applied.

C. Concrete substrates must be shot blasted, hydro blasted, and/or bush mill hammered to a CSP3 profile.

D. Concrete on grade (in ground) or with a relative humidity (RH) > 75% must have Qualipur 182 (Laykold Epoxy VTB Primer) applied to prevent moisture issues.

E. Water used in all mixtures shall be fresh and potable.

F. No part of the surfacing system shall be applied during a rainfall, or when rainfall is imminent.

G. Do not apply coatings to a cold substrate. Substrate and air temperatures must be at least 50°F (10°C) and rising. A minimum temperature of 50°F must be maintained during the entire installation process to include 24-hours before and after the installation.

H. Shaded areas will be cooler with slower curing times. Special precautions should be taken to ensure all coatings cure sufficiently prior to application of additional coatings.

I. Do not apply coatings if extremely high humidity prevents drying.

J. No coatings are to be applied if surface temperatures exceed 130°F (54° C).

K. All materials shall be delivered to the job site in sealed containers with the manufacturer's label affixed.

L. LM Topcoat color(s) to be selected by owner from manufacturer's product color card(s).

M. If all the above conditions are met, surfacing materials shall have a Five-Year limited warranty as supplied by the manufacturer.

1.5 WARRANTY

Advanced Polymer Technology Corp. (APT) warrants, subject to limitations, exclusions, terms and conditions contained herein, that the material supplied by APT, and which is covered by this Warranty, will not fail due to defects for five (5) years. APT's maximum responsibility under this Limited Warranty shall be limited to the replacement of material in a quantity not in excess of the quantity of material furnished by APT in connection with the project. No salesman or other employee or agent of APT is authorized to bind APT by any agreement, warranty, promise, or understanding not herein expressed.

This Limited Warranty is made and given in lieu of all other warranties and conditions, expressed or implied, statutory, or otherwise, including but not limited to any warranties or conditions of merchantability, durability and of fitness for a particular purpose. Under no circumstances shall APT be liable or otherwise obligated for indirect, incidental, or consequential damages of any nature or kind whatsoever, including damages arising in contract, tort, product liability or otherwise.

PART 2 – PRODUCTS

2.1 LAYKOLD MASTERS GEL/GEL PLUS SYSTEM COMPONENTS

A. All components of Laykold Masters Gel and Gel Plus system shall be supplied by Advanced Polymer Technology, an ISO 9001 and 14001 certified manufacturer. Masters Gel and Gel Plus system components shall not contain any lead, mercury, nor any heavy metals, PCB, or formaldehyde.

B. LM PU Primer: a two-component polyurethane primer for use on asphalt or concrete with RH < 75%.

C. Laykold VTB Primer: a two-component epoxy primer for use on concrete on grade or RH > 75%.

D. Laykold Basecoat: a flexible acrylic slurry used for asphalt substrate surface preparation.

E. LM GEL: a two-component polyurethane used to create a resilient, monolithic shock pad.

F. 0.5-1.5 Black Spray Rubber: Recycled SBR rubber, 0.5-1.5 mm in size (Laykold Masters Gel Plus only)

G. LM Wearcoat: a resilient, two-component polyurethane coating used to seal the shock pad and protect it from the damage.

H. LM Bond-Kote: a water-based adhesion promoter between polyurethanes and acrylic coatings.

I. LM Filler: a flexible, factory textured acrylic emulsion used as an interface coating to set a foundation for the pigmented acrylic

coatings.

J. LM Topcoat: a flexible, pigmented, wear and weather resistant acrylic emulsion for use with Laykold Masters Gel and Gel Plus Systems.

K. Laykold Line Prime: a clear drying acrylic emulsion line primer.

L. Laykold Textured White Line Paint: a factory textured, wear-resistant acrylic line marking paint.

PART 3 – EXECUTION

3.1 INSPECTION

A. Inspect concrete or asphalt substrate for dryness. Report any discrepancies to general contractor.

B. Surface of substrate shall be cleaned by general contractor as required.

C. Surfacing contractor to approve site and surface conditions prior to proceeding with application of any coatings.

3.2 Preparation

A. New Concrete or Existing Concrete Substrates

1. Concrete must be shot blasted, hydro blasted, and/or bush mill hammered to a CSP3 profile.

2. The workmanship of other contractors including the sub-base shall be level and compacted. The field dry density shall be a minimum of 95%. The concrete base must have a maximum deviation of ¼" inch below a 10-foot straight edge when measured by any random path.

3. New concrete shall be cured for a minimum of 30 days before proceeding.

4. All surfaces shall be checked to ensure a level surface. The surface shall be flooded with water, any area that retains 1/8" of water in depth after 20 minutes should be marked and leveled after the Laykold Epoxy VTB Primer application. All cracking And construction joints should be filled with the correct sealant. This sealant should be designed for waterproofing or moisture mitigation.

5. Surface cleaning - All surfaces must be clean, dry, and free from any bond inhibiting contaminants and foreign residue. Pressure wash the surface to remove any residues.

6. The polyethylene vapor barrier application shall be applied by additional contractors. The application of the barrier shall be installed preceding any cables or steel. The vapor barrier shall be applied at a minimum of two (2) 6-mil layers. Once the installation is completed do not allow any traffic (including vehicular) onto the surface.

B. New Asphalt Substrates

1. The workmanship of other contractors including the sub-base shall be level and compacted. The field dry density shall be a minimum of 95%. The asphalt base must have a maximum deviation of ¼" below a 10-foot straight edge when measured by any random path.

2. New asphalt shall be allowed to cure for a minimum of 14 days before proceeding.

3. All surfaces shall be checked to ensure a level surface. The surface shall be flooded with water, any area that retains 1/8" of water in depth after 20 minutes should be leveled with the approved product. All cracking should be filled with the correct

sealant.

4. Surface cleaning - All surfaces must be clean, dry, and free from any bond inhibiting contaminants and foreign residue. Pressure wash the surface to remove any residues.

C. Previously Coated Asphalt Substrates

1. All surfaces shall be checked to ensure a level surface. The surface shall be flooded with water, any area that retains 1/8" of water in depth after 20 minutes should be leveled with the approved product. All cracking should be filled with the correct sealant.

2. Surface cleaning - All surfaces must be clean, dry, and free from any bond inhibiting contaminants and foreign residue. Pressure wash the surface to remove any residues.

3.3 INSTALLATION

A. Laykold Basecoat is only required for New Asphalt. Apply the Laykold Basecoat using a 36" wide 55 Durometer flexible rubber squeegee. Thoroughly mix the Laykold Basecoat per TDS guidelines. The application rate shall be 0.05-07 gal/yd^2 or 120-140 ft^2/gal of undiluted Laykold, per coat. Each coat should be completely dry before applying subsequent coats.

B. LM PU Primer: Must be used when installing the Laykold Masters Gel and Gel Plus system. LM PU Primer is mixed by premixing "Part A" for 1 minute, then pouring the "B" component into the "A" component and mixing using a low speed jiffy mixer (400 to 600 rpm) for 2 minutes. Do not incorporate air when mixing. Spread the mixed primer on the substrate using a high-quality, medium nap roller to achieve a total coverage of approximately 0.025 gal/yd^2 (0.12 kg/m^2 - 360 ft^2/gal). The working time for LM PU Primer is approximately 40 - 50 minutes and is reduced in high temperatures. Lightly broadcast 40 to 60 mesh silica sand onto the wet primer at the rate of 5 pounds per 100 sq. ft. (0.24 kg/m^2) to create a rough texture. Allow 5 to 7 hours drying time before proceeding.

Laykold Epoxy VTB must be used when installing a Laykold Masters system over concrete substrates that are on grade (in ground) or where RH value exceeds 75% according to ASTM F 2170. Laykold Epoxy VTB is mixed by premixing "Part A" for 1 minute, then pouring the "B" component into the "A" component and mixing using a low speed jiffy mixer (400 to 600 rpm) for 2 minutes. Do not incorporate air when mixing. Spread Laykold Epoxy VTB on the substrate using a 36" 55 durometer squeegee and high-quality, 18" medium nap roller to achieve a total coverage of approximately 0.12 gal/yd^2 or 75 ft^2/gal. The working time for Laykold Epoxy Primer is approximately 40 - 50 minutes once on the ground and is reduced in high temperatures. Allow 8 to 10 hours drying time before proceeding.

NOTE: Only use material that naturally flows out of the pail. Do not scrape, bang, or place pail upside down to force additional materials out of pail.

C. Patching: Once the surface has been thoroughly cleaned and is free of all loose material, dirt, or dust, the court shall be flooded and allowed to drain a minimum of 20 minutes and a maximum of 1 hour. Any area that holds water (birdbaths) in a depth greater than 1/8 inch

shall be outlined and patched.

1. Surface Leveling - Asphalt:

    i. Birdbaths shall be leveled using Laykold Acrylic Deep Patch court patch binder slurry. Prime area with a 50/50 mixture of Laykold Acrylic Deep Patch and water. Primer shall be brushed into place and allowed to dry prior to patching. Patch mix

shall consist of Laykold Acrylic Deep Patch, 50-mesh sand and Type 1 Portland Cement. Mix as per manufacturer directions.

2. Leveling Concrete:

   i. Birdbaths shall be leveled using LM PU Primer after the Laykold Epoxy VTB Primer has fully cured. LM PU Primer is mixed by premixing "Part A" for 1 minute, then pouring the "B" component into the "A" component and mixing using a low speed jiffy mixer (400 to 600 rpm) for 2 minutes. Do not incorporate air when mixing. Split the mixed LM PU Primer equally into 2 clean, dry 5-gallon pails. Add 1 bag (50-lb) of 40-60 mesh clean, dry silica sand and mix until uniform. Once batch is uniformly blended, pour contents into depress and level with a screed. Allow to cure for 4-6 hours before proceeding with additional coatings.

3. Crack Filling – Asphalt: Cracks shall be cleaned, primed, and filled using Laykold Acrylic Resurfacer if cracks are 1/16 inch or less. If greater than 1/16 inch, Laykold Acrylic Deep Patch court patch binder slurry should be used to fill cracks. Mix as per manufacturer's directions. Refer to Laykold Deep Patch technical data sheet for additional mixing details and application instructions for filling various sized cracks. Laykold Crack Filler and Qualicaulk are acceptable substitutes.

4. Crack and Construction Joints - Concrete: Cracks and construction joints shall be cleaned and filled with caulking designed for waterproofing or moisture mitigation such as BASF Masterseal NP-1 or Tremco Dymonic 100.

5. All areas that are repaired/leveled/corrected using a court patch binder mixture shall be allowed to fully cure and then ground smooth and level with the substrate by stone or an acceptable mechanical method. Laykold PolyPrimer (used as a mastic) is an acceptable substitute.

D. Install Laykold Masters Gel and Gel Plus system according to guidelines provided by Advanced Polymer Technology Corp., Harmony, PA.

3.4 PROTECTION

A. Cure Time. No traffic or other trades shall be allowed on the surface for a period of one week following completion to allow for complete and proper cure of the finish.

B. Other Trades. It is the responsibility of the general contractor to protect the surface from damage by other trades before acceptance by the owner or the owner's authorized agent.

C. Do not allow surrounding sprinkler systems to spray water on the newly applied court surface for a period of one week after completion.

D. Do not place any benches, chairs, ball baskets, or any other type of court equipment on the newly applied court surface for a period

of one week after completion.

E. Do not allow black soled shoes, bicycles, rollerblades, etc. on the court surface. Black scuff marks cannot be removed!

3.5 MAINTENANCE

A. Dirt Contamination

1. Broom, wash or blow dirt off court on a regular basis.

2. Annual pressure washing of court surface is recommended.

3. Most dirt and stains can be removed with a neutral pH cleaner used in proper dilution. Pre-test cleaner on small area in corner of court.

B. Proper maintenance procedures and housekeeping practices should be performed on a timely as needed basis.

Acrylic, all-weather tennis and athletic surfacing systems are designed and used to visually enhance asphalt and concrete substrates while providing a desired surface texture, surface pace and/or speed of play. Laykold systems and system components may be used to level surface depressions, fill substrate cracking, smooth surface roughness and make other such adjustments to a new or existing surface/substrate. However, acrylic all-weather tennis and athletic surfacing systems are NOT capable of solving the problems and/or forces associated with cracked, deteriorating, or damaged substrates.

DIVISION 2
SECTION 02550

BLUESTONE PAVERS

PART 1 GENERAL

a. Under this Section, the Contractor shall furnish and install bluestone pavement on mortar setting bed in accordance with the plans, specifications.

02550.1 RELATED WORK OF OTHER SECTIONS

PART 2 PRODUCTS

A. Square bluestone shall be 1½" in thickness and the surface shall vary no more than 1/8" in each square foot of area. Exposed edges of all flags shall be cut plumb. The color shall be variegated and range from blue-gray to blue-green with buff, lilac and rust highlights. The pattern shall be random rectangular and square and shall have a thermal non-slip texture. The bluestone shall meet the following physical properties.

Weight: 168 lbs. per cu. ft.
Chemical Analysis: Silica 77.60%, Alumina 9.51%, Iron Oxide 3.29%, Titanium Oxide .60%, Calcium Oxide 2.30%, Magnesium Oxide 1.41%, Alkalies 1.81%, Sulphur Trioxide .10%, Lose on ignition 3.20%
Water Absorption: 1.2% to 1.6% in 96 hours.

Compressive Strength across strata	17,000 to 18,500 lbs. per sq. in.
Compressive Strength with strata	10,000 to 11,000 lbs. per sq. in.
Flexural Strength across strata	2,000 to 2,300 lbs. per sq. in.
Flexural Strength with strata	1,200 to 1,600 lbs. per sq. in.
Abrasion Resistance IIa Value	45 average

B. Prepare existing concrete substrate to allow for new pavers.

C. Base course shall be compacted porous fill meeting the requirements of Section 02300.

D. Joint Treatment - Joints between flagstones shall read from ½" wide maximum. Install Mortar joints between pavers.

E. Concrete substrate shall be kept damp until installation of pavers is complete.

PART 3 EXECUTION

A. Stone work shall be accomplished by skilled mechanics in strict conformance with trade standards.

B. Pattern shall be a 3 size random pattern as shown on drawings, or as approved by the Consultant.

02550.5 SUBMITTALS

A. Contractor shall submit proposed sizes and pattern prior to ordering stone for approval by the Consultant.

B. Contractor to furnish representative sample from an approved source prior to ordering any material.

C. Submit sieve analysis of base course material and sand certified by an approved testing lab.

End of Section

DIVISION 2 – SITE WORK

SECTION 02600 – HOT MIX ASPHALT (HMA) PAVEMENT SYSTEM

PART 1 – GENERAL

1.01 GENERAL

A. These specifications are intended to meet the latest edition of the N.Y.S.D.O.T. standard specifications U.S. Edition Section 403. It is the responsibility of the contractor to verify if the portions stated herein are current. This may be done by visiting the N.Y.S.D.O.T. website at www.nysdot.gov/main/businesscenter/engineering/specificationsupdated-standard-specifications-us.

B. GC shall be responsible for all work to be provide in conformance with sections referred to herein or within specification sections found on the N.Y.S.D.O.T. website.

C. Drawings and General Provisions of the Contract and Supplementary conditions and Division 1 specification sections, apply to the work of this section.

1.02 SCOPE

A. The work of this section applies to all recycled concrete aggregate (RCA) sub-base and asphalt items in the contract. The work shall consist of preparing the existing subgrade material to receive the new RCA sub-base, as well as furnishing, mixing, spreading and compacting the RCA sub-base, dense asphalt binder course and the asphalt top course to the lines, grades, and dimensions shown on the plans and as specified herein.

B. Unless shown otherwise indicated on plans the new pavement system for roads and parking lots shall be as follows:

1. Recycled concrete aggregate sub-base course shall be 6″ thick (compacted) N.Y.S.D.O.T. type 1, option B, alternate A or B.

2. Dense asphalt binder course shall be 3 ½ inches (compacted) thick N.Y.S.D.O.T. type 3.

3. Asphalt top course shall be 1 ½ inches thick N.Y.S.D.O.T. type 6F3.

C. Unless otherwise indicated on plans the pavement systems for tracks and tennis courts shall be as follows:

1. Tracks:

a. Recycled concrete aggregate sub-base course shall be 6″ thick (compacted) N.Y.S.D.O.T. type 1, option B, alternate A or B.

b. Dense asphalt binder course shall be 2 ½ inches (compacted) thick N.Y.S.D.O.T. type 3.

c. Asphalt top course shall be 1 ½ inches thick N.Y.S.D.O.T. type 7.

2. Tennis Courts:

a. Recycled concrete aggregate sub-base course shall be 6″ thick (compacted) N.Y.S.D.O.T. type 1, option B, alternate A or B.

b. Dense asphalt binder course shall be 2 ½ inches (compacted) thick N.Y.S.D.O.T. type 3.

c. Asphalt top course shall be 1 ½ inches thick N.Y.S.D.O.T. type 7.

D. Unless otherwise indicated on plans, asphalt play surfaces and walks shall be 2″ Type 7 asphalt over 6″ RCA as described in B above.

1.03 RELATED SECTIONS

A. 01451 – Tests, Inspections and Special Provisions.
B. 02000 – Site Work – General Provisions
C. 02105 – Stakeout
D. 02200 – Earthwork
E. 02270 – Sediment and Erosion Control Procedures & Requirements
F. 02400 – Site Drainage
G. 02577 – Pavement Markings
H. 02578 – Thermoplastic Pavement Markings
I. 02579 – Preformed Reflectorized Pavement Markings
J. 02601 – Asphalt Overlay
K. 02602 – Asphalt Repair
L. 03300 – Cast-in-Place Concrete
M. 03311 – Concrete Curb
N. 03318 – Driveway Aprons

1.04 SUBMISSIONS

A. All submissions shall be made in accordance with Section 01300 – Submissions.

B. For the recycled concrete aggregate (RCA) the Contractor shall submit a sieve gradation for approval by the architect. Along with sieve, the Contractor shall submit documentation that the material to be provided will be obtained from a N.Y.S.D.E.C. registered or permitted construction and demolition (C & D) debris processing facility as specified in Section 360-16.1 of 6NYCRR Park 360 “Solid Waste Management Facilities.” If blast furnace slag is to be used, provide beneficial use determination (BUD) prior to its use as specified in the 6NYCRR par 360-1.15, “Solid Waste Management Facilities.”

C. For the asphalt binder and top course, the Contractor shall submit to the Architect for approval, the job mix formula with

current date, job location, asphalt plant, and contractor name. The type of asphalt and course shall also be stated. The job mix formula sheet shall indicate the gradations of the aggregates to be used in the mix along with the PGB content.

D. It shall be the Contractors responsibility upon the initial delivery of the materials and during subsequent deliveries, to take samples for testing as described In Section 1.06 Quality Assurance. If for any reason the Owner or Architect shall request the material be tested, the Contractor shall provide the samples free of charge. If requested the Contractor shall also perform, free of charge, core samples of the constructed work for testing. All test results will be copied to the Contractor for their record.

E. Contractor shall provide written certification on their company letterhead that all installed asphalt was produced and installed in accordance with N.Y.S.D.O.T. specifications and guarantee work against structural and material defects for a period of one year from completion date.

F. Interim and final as-built surveys; reference Quality Assurance section below and Specification Section 01720.

1.05 QUALITY ASSURANCE (RCA SUB-BASE)

A. The Contractor is responsible to establish and maintain required design, grades, lines and elevations including crown and cross-slope of sub base course.

B. An independent testing laboratory, selected and paid for by the Owner shall be retained to perform construction testing of the in place sub-base course, for compliance with the Contract Documents. The Contractor shall arrange for and schedule the testing. The sub-base course shall be checked for thickness and tolerance by rod and level readings on a 50 ft. grid or as directed by the Architect. Readings shall be to +0.05’ of design elevation that allow for asphalt thickness as shown on the Contract Documents. The Contractor shall at no cost to the Owner provide instruments personal and a suitable benchmark. Any deficiencies shall be corrected prior to proceeding with paving operations.

1. Prior to paving parking lots or plaza areas greater than 10,000 sf, the contractor shall provide an interim topographical survey of the RCA Sub-base in the datum of the Construction Documents for review for conformance by the Architect. Said survey is required to be performed a licensed land surveyor. Spot elevations on said survey shall be in complimentary locations to the Construction Drawings.

C. The following tests shall be performed on the sub-base material ASTM 1557 or ASTM D698 compaction test to determine % of compaction and molding water content needed to achieve the required engineering properties of the sub-base.

D. The following test shall be performed on the sub-base material ASTM D4318 determination of the liquid limit, plastic limit, and the plasticity index of soils.

E. In place sub-base material shall be tested in accordance with ASTM D1556 to determine the in place density and unit weight of soils using a sand cone apparatus, or ASTM D2167 to determine the in place density and unit weight of the compacted sub-base.

F. The sub-base material shall be compacted to not less than 98% of optimum density as determined by ASTM D698 or 95% as determined by ASTM D1557, unless otherwise indicated on the drawings.

G. The in place sub-base material shall be tested for thickness and compaction for each 5,000 square feet for jobs up to 20,000 s.f. and for each 10,000 s.f. for jobs larger than 20,000 s.f.

H. The independent testing laboratory shall prepare test reports that indicate test location, elevation data from a construction site benchmark, and test results. The Owner, Architect and Contractor shall all be provided with copies of reports within 96 hours of the time the test was performed. In the event that any test performed fails to meet these specifications, the Owner and the Contractor shall be notified immediately by the testing laboratory. It shall be the Contractor's responsibility to correct any non-conforming work at no additional cost to the Owner and pay for all additional testing by the independent testing laboratory to prove corrective work is in conformance with these specifications.

1.06 QUALITY ASSURANCE FOR HOT MIX ASPHALT (HMA)

A. All materials for hot mix asphalt (HMA) production, such as, aggregates, PG binder, reclaimed asphalt pavement (RAP), mineral filler, or any other materials shall meet N.Y.S.D.O.T. requirements.

B. The Contractor shall be responsible for quality control (QC). QC is defined as all activities required to produce HMA that meets all specification requirements. The Contractor shall provide HMA and assume all responsibilities for all QC activities at the production facilities.

C. Methods of Sampling and Testing

1. All HMA material shall be sampled and the properties enumerated in these specifications shall be determined in accordance with the following methods, as currently revised.

   a. Sampling mineral aggregates ASTM: D-75
   b. Sampling bituminous mixtures ASTM: D-979
   c. Sieve analysis of aggregates ASTM: C-136
   d. Determination of bitumen content ASTM: D-1097
   e. Specific gravity of coarse aggregate ASTM: C-127
   f. Specific gravity of fine aggregate ASTM: C-128

g. Sieve analysis of mineral filler ASTM: D-546
h. Sampling bituminous materials ASTM: D-140
i. Liquid limit, plastic limit & plasticity index ASTM: D-4318

Or current applicable methods recommended by the American Association of State Highway Officials, and/or The Asphalt Institute.

D. The PG binder will be accepted on the basis of PG binder suppliers certification. The Contractor shall provide a copy to the Owner.

PART 2 – MATERIALS

2.01 COMPOSITION OF MIXTURES (RCA)

A. Recycled concrete aggregate sub-base shall conform to N.Y.S.D.O.T. specification section 304, U.S. latest edition.

1. Contractor shall provide suitable material conforming to the requirements of N.Y.S.D.O.T. Section 203 and to the requirements contained herein.

2. Provide RCA which meets the specification material requirements and is within the Contractors capabilities to place and fine grade to the required tolerances.

3. If Alternate A is used, furnish materials of at least 95%, by weight, of recycled portland cement concrete aggregate (RCA), and free from organic and other deleterious material. This material may contain up to 5% by weight asphalt and/or brick.

4. If Alternate B is used, furnish a mixture of recycled portland cement concrete aggregate (RCA) conforming to Alternate A above mixed with stone, sand, gravel or blast furnace slag. This material may contain up to 5% by weight asphalt and/or brick.

5. Gradation for RCA shall conform to the following:

Sieve Size Designation	Percent Passing by Weight
4 inch	-
3 inch	100
2 inch	90 – 100
¼ inch	30 – 65
No. 40	5 – 40
No. 200	0 -10

7. Material will be accepted on the basis of magnesium sulfate soundness loss after four cycles of 20% or less. The required plasticity index of the material passing the No. 40 sieve is 5.0 or less.

8. A flat or elongated particle is defined herein as one which has its greatest dimension more than three times its least dimension. Provide material consisting of particles where not more than 30% by weight, of the particles retained on a ½ inch sieve are flat or elongated. Material with a percentage greater than 30 will be rejected.

2.02 COMPOSITION OF MIXTURES (HMA)

A. The HMA plant mix will generally be composed of a mixture of aggregate reclaimed asphalt pavement (RAP), filler if required, and PG binder. For any HMA required by the plans, formulate a job mix formula that satisfies the general limits imposed by N.Y.S.D.O.T. Table 403-1 Composition of Hot Mix Asphalt Mixtures latest version). A copy of this table can be found at the end of this section. See section 1.02B for system components. For type 6F3 mixture, determine the optimum asphalt content for the proposed gradation using the Marshall mix design method (50 blows). The resultant mixture shall meet the following Marshall properties.

Mix Property	Type 6F3
Air Voids %	3.0 – 5.0
Voids in Mineral Aggregate	14
Voids filled with Binder VFB, %	65 - 78

Contractor shall produce, deliver to the work site, and incorporate the mixture into the work within the mixing and placing temperature range imposed by Table 403-1 Composition of Marshall designed plant mixtures. The plant mixed material will be accepted after blending and mixing at the plant. The pavement courses will be accepted after all paving operations are completed and certified by the Contractor.

B. Fine aggregate will consist of materials conforming to the requirements of Section 703-01 - Fine Aggregate of the N.Y.S.D.O.T. specifications. In addition, fine aggregate may consist of screenings, free from deleterious materials and manufactured from sources of stone, gravel, or slag meeting the requirements of N.Y.S.D.O.T. specification section 703-02, Coarse Aggregate.

C. Coarse aggregate will consist of crushed stone, crushed gravel or crushed slag conforming to the N.Y.S.D.O.T. requirements of section 703-02, Except for Gradation.

D. When aggregates from approved natural fine sand sources are combined with coarse aggregates in the mixture, aggregate particles will meet additional requirements as follows:

1. Particles in the No. 1A and No. 1 primary sizes will meet the quality requirements of N.Y.S.D.O.T. specification section 703-02 and will have a minimum

of 85% by weight, of the particles with at least two fractured faces.

2. Particles in the No. 2, No. 3 and No. 3A primary sizes will meet the quality requirements of N.Y.S.D.O.T. section 703-02 and will have a minimum of 75%, by weight, of the particles with at least one fractured face.

E. Coarse aggregate type 6F3 conditions:

1. Limestone or a blend of limestone and dolomite having an acid-insoluble residue content of not less than 20%

2. Dolomite

3. Sandstone, granite, chert, traprock, ore tailings, slag or other similar non-carbonate materials.

4. Gravel, or a natural or manufactured blend of the following types of materials: limestone, dolomite, gravel, sandstone, granite, chert, traprock, ore trailings, slag or other similar materials meeting the following requirements:

a. (Type 6F3 Mixes) non-carbonate plus 1/8 inch particles must comprise a minimum of 10.0% of the total aggregate (by weight with adjustments to equivalent volumes of materials of different specific gravities). Additionally, a minimum of 20% plus ¼ inch particles must be non-carbonate.

b. When coarse aggregate for these mixes are from more than one source or of more than one type of material, proportion and blend them to provide a uniform mixture.

F. Mineral filler if required in the mix to meet gradation requirements, shall conform to the requirements of the N.Y.S.D.O.T. specification section 703-08, Mineral Filler.

G. Performance graded binder (PG Binder) shall meet the requirements of the N.Y.S.D.O.T. specification section 401- 2.04, Performance Graded Binder. Unless the type of PG Binder is specified in the Contract Documents, use PG 64-22, or a PG Binder specified in Table 6-4, Performance Graded Binder section of Chapter 6 of the Comprehensive Pavement Design Manual.

H. Reclaimed asphalt pavement (RAP) shall meet the requirements as written in the materials method (MM) 5.16 superpave hot mix asphalt mixture design and mixture verification procedures.

TABLE 403-1 COMPOSITION OF HOT MIX ASPHALT MIXTURES												
Mixture	**Base**				**Binder**		**Shim**		**Top[3,4]**			
Require-ments[1]	**Type 1**		**Type 2**		**Type 3**		**Type 5**		**Type 6, 6F2, 6F3**		**Type 7, 7F2, 7F3**	
Screen Sizes	**General limits % Passing**	**Job Mix Tol. %**	**General limits % Passing**	**Job Mix Tol. %**	**General limits % Passing**	**Job Mix Tol. %**	**General limits % Passing**	**Job Mix Tol. %**	**General limits % Passing**	**Job Mix Tol. %**	**General limits % Passing**	**Job Mix Tol. %**
2 in	100	-	100	-	-		-	-	-	-	-	-
1 ½ in	90-100	-	75-100	±7	100	-	-	-	-	-	-	-
1 in	78-95	±5	55-80	±8	95-100	-	-	-	100	-	-	-
½ in	57-84	±6	23-42	±7	70-90	±6	-	-	95-100	-	100	-
¼ in	40-72	±7	5-20	±6	48-74	±7	100	-	65-85	±7	90-100	
1/8 in	26-57	±7	2-15	±4	32-62	±7	80-100	±6	36-65	±7	45-70	±6
No. 20	12-36	±7	-	-	15-39	±7	32-72	±7	15-39	±7	15-40	±7
No. 40	8-25	±7	-	-	8-27	±7	18-52	±7	8-27	±7	8-27	±7
No. 80	4-16	±4	-	-	4-16	±4	7-26	±4	4-16	±4	4-16	±4
No. 200	2-8	±2	-	-	2-8	±2	2-12	±2	2-6	±2	2-6	±2
PGB Content %[2]	4.0-6.0	0.4	2.5-4.5	0.4	4.5-6.5	0.4	7.0-9.5	0.4	5.4-7.0	NA	5.7-8.0	NA
Mixing &[5] Placing Temp. Range, °F	250-325		225-300		250-325		250-325		250-325		250-325	
Description and Typical Uses	Dense Base: For general use		Open Base: For permeable base layer		Dense Binder: Intermediate layer for general use		Shim: Fine HMA mixture for shimming ruts and leveling		Top Course: Dense course for single course resurfacing of rural, suburban, and urban roadways			

1. All aggregate percentages are based on the total weight of the aggregate.
2. The asphalt content is based on the total weight of the mix. When using slag aggregates in the mix, increase the PGB content accordingly, a minimum of 25% for an all slag mix.
3. 6F2, 6F3, 7F2, 7F3 mix types require friction coarse aggregates, and are required for mainline driving surface courses.
4. For Type 6 and Type 7 (F9) aggregate requirements, Marshall design will not be required. These mix types are suitable where the State's requirements for f9 aggregate apply.

5. Introduce the PG Binder into the pug mill between 225°F and 350°F, or as recommended by the PG Binder supplier.

2.03 TACK COAT

A. Tack coat shall meet the requirements of the N.Y.S.D.O.T. specification section 407-2, Materials. The tack coat shall meet the requirements of Table 702-10, Tack Coat. Tack coat shall be on the N.Y.S.D.O.T. approved materials list.

TABLE 702-10 – TACK COAT		
Test Requirements	Min	Max
Sieve Test, %	-	0.10
Residue by Distillation %	38	45
Oil Distillate, volume of total emulsion %	-	2
Test on Residue Distillation: penetration, 77°F (25°C), 100g, 5 second	40	90
Suggested spraying temp, °F	75	150

B. Application of Emulsion Material

1. The asphalt emulsion contained in the distributor tank shall be homogenous. Emulsified asphalts held in storage tanks, drums, or distributors for long periods are subject to settlement. The asphalt emulsion shall be sufficiently agitated or circulated to ensure a homogenous emulsion prior to sampling or application.

PART 3 – EXECUTION

3.01 PREPARATION OF SUBGRADE

A. The subgrade surface is the surface of the road section upon which the select materials and/or sub-base are placed. The Contractor shall be responsible to cut and fill subgrade as required to achieve design grades. The subgrade area shall be prepared in conformance with N.Y.S.D.O.T. section 203, Excavation and Embankment. It shall be the Contractor's responsibility to properly place and compact all materials in the road section and to correct any deficiencies resulting from insufficient or improper compaction of such materials throughout the Contract period. The Contractor shall determine the type, size and weight of the compactor best suited to the work at hand, select and control the lift (layer) thickness, exert control over the moisture content of the material, and other details necessary to obtain satisfactory results. The subgrade shall be compacted to density in accordance with section 02200 – Earth Work, but not less than 95% of modified proctor maximum dry density.

3.02 RCA SUBBASE

A. RCA subbase course shall be placed in conformance with section 304 of the N.Y.S.D.O.T. standard specifications US latest edition.

B. Contractor shall place RCA in a single layer with a minimum compacted layer thickness of 6 inches.

C. When the moisture content is within the limits for proper compaction, compact the material in accordance with the requirements of section 203-3.12 N.Y.S.D.O.T. specifications.

D. If the subbase course is disturbed by frost action prior to paving, re-compact the subbase.

E. If, in the opinion of the Architect, the subbase is damaged or mixed with the subgrade or any other material due to the Contractor's operation the Contractor shall remove such material and replace it with the appropriate subbase at no additional cost to the Owner.

F. Place subbase so that after compaction the top surface of the course does not extend more than ¼" above nor more than ¼" below true grade for the course at any location.

3.03 CONDITIONS FOR PLACEMENT OF ASPHALTIC MATERIALS

A. Weather – Seasonal Limitations

1. The mixing and place of hot-mix asphalt shall be performed only when weather conditions are suitable. When pools of water are observed on the base, mixing and placing of hot-mix asphalt shall not be permitted. The temperature of the surface on which hot-mix asphalt is placed shall be as per Table 402-2.

2. Bituminous concrete pavement placed between November 30th and April 1st shall be subject to the following conditions and regulations:

   a. Approval of the Engineer.
   b. Compliance with Table 402-2 below.
   c. Acceptance of full responsibility by the Contractor for all work so placed.
   d. Providing for such guarantees and deposits as are required by Town regulations.
   e. Guarantee of all work so placed for a period extending up to one year. A notification from the Engineer before the end of the last month of the calendar year following shall be deemed to be within the period of guarantee.

TABLE 402-2 TEMPERATURE AND SEASONAL REQUIREMENTS

Nominal Compacted Lift Thickness	Surface Temperature (Minimum (Note 1)	Seasonal Limits
≤ 1 in.	50°F	(Notes 2 & 3)
1 in.<Thickness ≤ 3 in.	45°F	(Notes 2 & 3)
>3 in.	40°F	None

NOTES:

1. Measure all temperatures on the surface where the mixture is to be placed and the controlling temperature will be the average of three temperature readings taken at locations a minimum of 25 ft apart.
2. Unless otherwise authorized place Top Course only during the period of April 1st up to and including November 30th in the counties of Dutchess, Orange, Rockland, Putnam, Westchester, Nassau, Suffolk, and the City of New York.
3. Unless otherwise authorized place Top Course only during the period of April 15th up to and including October 31st in all counties except as required in Note 2.

3.04 TACK COAT

A. Apply a thin, uniform tack coat under the provisions of N.Y.S.D.O.T. section 407, Tack Coat to surfaces of existing asphalt, Portland cement concrete layers including such areas as adjacent pavement edges, curbing, gutters, manholes, and other structures, immediately prior to place the HMA mixture against them.

B. Apply tack coat on the contact surfaces between all HMA pavement lifts in accordance with N.Y.S. D.O.T. Section 407, Tack Coat, prior to placing HMA mixture regardless of time period between lifts. The only exception to this is the surface of permeable base courses. Paving over a tack coat should not commence until the emulsion has broken (goes from brown to black) or is tacky when touched.

C. The tack coat shall be applied to a prepared clean pavement and in a manner to offer the least inconvenience to traffic and to reduce pickup or tracking of the bituminous material. Upon application the material shall be as uniformly spread across the width of the designated area.

D. The tack coat shall not be applied on a wet pavement surface or when the pavement surface temperature is below the temperature requirements outlined in Table 402-2 *Temperature and Seasonal Requirements*. To avoid "boil-off" of the water, the asphalt emulsion shall not be heated above 195^{o}F. The application rate shall be as determined in Table 407-1.

TABLE 407-1 TACK COAT APPLICATION RATES

Surface Type	Application Rate (gallons per square yard)
New Hot Mix Asphalt	0.03 – 0.04
Milled Surfaces	0.05 – 0.06
Portland Cement Concrete	0.05 – 0.06
Vertical Surfaces (curbs, drainage structures, and appurtenances)	0.06-0.07

3.05 SPREADING AND FINISHING OF HMA

A. Lay the mixture upon an approved clean, tack coated surface. The only exception to this is the surface of permeable base courses. Spread and strike off to the established grade and elevation. Use HMA paver(s) to distribute the mixture either over the entire width or over such partial width as may be practicable. Upon arrival at the site, the trucks will dump the mixture into the paver. Immediately spread and strike off to the required width and appropriate loose depth to obtain the required compacted thickness at completion of the work.

B. When the initial pavement course is laid with automatic HMA pavers, guide the paver by a taut reference line positioned at or near the pavement centerline or edge. Erect and maintain the reference line. Support the reference line at approximately 25 foot intervals on tangent sections and at closer intervals on curves. Tension the line sufficiently to remove any sags. A moving reference of at least 30 ft. in length in lieu of a reference line may be used. The moving reference may be a floating beam, ski, or other suitable type such that the resulting pavement layer surface is sufficiently even. A short ski or shoe may also be used for the initial course if a satisfactory fixed reference such as a curb, gutter, or other fixed reference is adjacent to the pavement. When the proposed floating beam or the short ski does not produce the results

similar to those obtained using a taut reference line, do not use these devices.

C. Place subsequent pavement courses over the initial course using one of the above methods. In addition, any course in an adjacent lane may be used as the reference for the use of a short ski.

D. The automatic screed controls will not be required where existing grades at roadway intersection or drainage structure must be met, for shoulders, temporary detours, behind curbs, or in other areas where its use is impractical.

E. If there are less than 1500 square yards in the Contract, or the areas to be paved are small and scattered, the HMA mixture may be spread by hand methods. For these areas, dump and spread the mixture such that the compacted thickness meets the specified thickness in the plans.

F. Prior to the beginning of rolling, check the loose mat, adjust any irregularities, and remove and replace all unsatisfactory material.

3.06 COMPACTION OF HMA

A. Immediately after the HMA mixture has been spread, struck off and surface irregularities adjusted, thoroughly and uniformly compact it by rolling. Roll the surface when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking or shoving. Initially roll all courses with the roller traveling parallel to the centerline of the pavement beginning at each edge and working toward the center. Roll banked curves starting at the low side edge and working toward the super-elevated edge.

B. Correct at once any displacement occurring as a result of reversing the direction of the roller, or from other causes, by the use of rakes and addition of fresh mixture as required. Exercise care in rolling so as not to displace the line and grade of the edges of the HMA mixture. To prevent adhesion of the mixture to the drum(s) and pneumatic tires, keep the drum(s) and the pneumatic tires properly moistened with water or water mixed with small quantities of detergent or other approved material. Any petroleum products or solvents having an adverse effect upon the HMA pavement will not be permitted for use.

C. There shall be no visible defects, such as shallow ruts, ridges, roller marks, cracking, tearing, segregation, or any other irregularities as determined by the Architect, in the pavement when the rolling operation is complete. If these defects are present, correct these defects to the satisfaction of the Architect or remove & replace the pavement at no additional cost.

D. Along forms, curbs, headers, walls and other areas not accessible to the rollers, thoroughly compact the mixture with mechanical tampers. On depressed areas, use a trench roller or a small vibratory roller. Cleated compression strips may also be used under the roller to transmit compression to the depressed area.

E. Remove and replace any mixture that becomes loose and broken, mixed with dirt, or is in any way defective with fresh HMA mixture which shall be compacted to conform with the surrounding area. Correct any area showing an excess or deficiency of HMA material to the satisfaction of the Architect.

F. Compaction shall be per Three Roller Compaction Train

1. Initially roll all HMA mixtures with an approved steel-wheel roller operating in a static mode. Overlap the previous roller passes by one-half the width of the roller.

2. Immediately following the initial rolling, roll the mat with an approved pneumatic rubber-tired roller. A minimum of 3 passes of the rubber-tired roller will be required. One pass is defined as one movement of the roller over any point of the pavement in either direction.

3. Immediately following the intermediate rolling, finish roll the mat with a steel-wheel roller to remove all shallow ruts, ridges, roller marks and other irregularities from the surface.

4. Use this compaction method only when the compacted thickness of the finished mat is 4 inches or less. Unless approved by the Architect, the roller speeds shall not exceed 3 mph. when paving multiple lanes simultaneously; increase the required number of rollers proportionately for each additional full lane width unless otherwise permitted by the Architect.

G. The required number of passes listed in Table 403-2, Number of Passes, is recommended and may be increased as necessary to achieve adequate density.

TABLE 403-2 NUMBER OF PASSES

Pavement Courses	**Three Roller Train (Static)**	
	Steel Wheel Roller	**Pneumatic Roller**
Base (Open Graded Each Lift)	4	3
Base (Dense-Graded)	4	3
Binder (Dense-Graded)	2	3
Top (Dense-Graded All Types)	2	3

END OF SECTION

DIVISION 2 - SITE WORK

SECTION 02801 - TOPSOIL, LAWNS AND GRASSES

PART 1 - GENERAL

1.01 DESCRIPTION

A. The work of this section is subject to all applicable provisions of the "General Conditions" and "Supplementary General Conditions", which form a part hereof whether attached hereto or not.

B. Under this item, the Contractor shall furnish and install topsoil, lawns and grasses in accordance with the plans, specifications, and as ordered by the Architect. This Contract includes all work of this Trade for a complete coordinated job, in order to provide an acceptable stand of turf by creating a rootzone mixture with seed or sod, including **decompaction of existing 12" of existing play field surfaces**, grading, topdressing, placing topsoil, soil amendments and sod, in accordance with the drawings as specified. The Contractor recognizes that the Plans and Specifications which form a part of this Contract reflect the overall intention and functional purpose, but that in all aspects the detailed Plans and Specifications might not be complete, but the Contractor does include as part of this work any and all provisions whether or not shown, to make his work under this Contract complete in every respect and to make any and all systems that he is responsible for complete system and to be in accordance with all authorities having jurisdiction.

C. Furnish all labor, material and appurtenance required for the installation of Topsoil and Seed as shown on the drawings and/or as herein specified. In general the work shall include but not necessarily be limited to the following:

(1) Decompaction of existing 12" of existing play field surfaces, and placing (fine-grading) of topsoil as required for seeding.

(2) Seeding, sodding and establishing permanent grass lawns or swale areas.

(3) All other work required to complete the work of seeding, sodding and related items as shown on the drawings and as herein specified.

(4) Establishment, protection, maintenance, clean-up and replacement of lawns as required under the specified guarantee.

D. The work must comply with the requirements of the following related specifications sections:

1. **Division 1 Section "LEED Requirements" for additional LEED requirements (For LEED Certified Projects).**

2. **Division 1 Section "Construction Waste Management" for recycling construction waste (For LEED Certified Projects).**

3. Division 2 Section 02200 "Earthwork".

4. Division 2 Section 02270 “Sediment and Erosion Control”.

1.02 SHOP DRAWINGS, SUBMISSIONS AND APPROVALS

A. All submissions shall be in accordance with Section 01300 submission requirements.

B. Submit manufacturer’s product data for each material or accessory to be utilized in association with the work of this section. Include MSDS sheets for all fertilizers and limestone.

C. Submit topsoil certifications and test reports.

D. Within seven (7) calendar days after awarding of the Contract, submit the following:

(1) List of all materials, equipment, and manufacturers proposed to be furnished. Shop drawings will not be reviewed prior to approval of the list of manufacturers.

(2) List of name of any subcontractors to be used for approval.

E. Interim and final as-built surveys; reference Quality Assurance section below and Specification Section 01720.

F. **LEED Submittals: For LEED Certified Projects: Submit recycled content and regional materials documentation for each type of product provided under work of this Section in accordance with Section 01352 “LEED Requirements”.**

1.03 REQUIREMENTS / QUALITY ASSURANCE

A. The Contractor shall provide his own Engineer and/or Licensed Surveyor for establishing all topsoil and seed limits in the field and grades as required to meet the requirements of the Contract Documents.

1. For athletic fields: Upon completion of subgrade, prior to laying topsoil, the contractor shall provide an interim topographical survey in the datum of the Construction Documents for review for conformance by the Architect. Spot elevations on said survey shall be in complimentary locations to the Construction Drawings.

B. Notice of Sources: Within 10 days following award of Contract, the Contractor shall notify the Architect of the sources of the materials required; they may be inspected and tested if desired by the Architect.

C. Topsoil Testing: The Contractor shall take samples of the topsoil and have tests made to determine the appropriate proportions of supplements necessary for properly conditioned material (such as

"Quick Test" to determine if lime should be used). Methods used shall be as approved by the Association of Agricultural Chemists or the State Agricultural Experiment Station. Preparation work necessary to bring the topsoil into proper condition to receive seeding shall be made in accordance with said tests at no additional cost to the Owner. Copies of said tests and recommendations are to be submitted to the Architect for approval prior to starting the Work of this Section.

D. Seeds: Packages of seed shall bear official State or Federal stamps and certificates indicating the type, quality, and content of the seed packages. Deliver packages unopened.

1.04 VERIFYING CONDITIONS

A. The Contractor shall examine all drawings which may affect the work of this section or require coordination by same.

B. Before starting any work, examine existing conditions and thoroughly check all drawings, specifications, adjoining or underlying conditions in which the work of this section is to be performed, and all dimensions.

C. Report in writing to the Architect any and all conditions which may interfere with or otherwise affect work of this section.

D. Seeding operations shall be conducted under favorable conditions during the next season or seasons which are normal for such work as determined by accepted practice in the locality of the Project.

1.05 PROTECTION OF WORK

A. Landscaped areas shall be protected by the Contractor against traffic damage, erosion, or other use by erecting barricades or temporary fencing immediately after seeding is completed and by placing warning signs of a type approved by the Architect on various areas. These barricades, or temporary fencing, and signs shall be maintained until the lawns are well established.

B. The Contractor shall maintain all seeded areas without additional payment until the expiration of the maintenance period. Any areas that fail to show a uniform stand of grass will be reseeded and re-fertilized at the Contractor's expense, until an acceptable stand of grass is established.

C. Upon final acceptance of the work specified herein, the Contractor shall remove all barricades or temporary fences.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Topsoil: Stockpiled topsoil may be used, provided it meets the requirements of these specifications. Additional topsoil from certified off-site sources shall be used, provided it meets the requirements of these specifications. Topsoil for lawn and planting operations shall be fertile, friable, natural loam containing a liberal amount of humus. It shall be free of admixtures and subsoil and shall be reasonably free of noxious weed, seed, lumps, plants, or their roots, and completely free of stones, sticks, and other extraneous matter, and shall not be used for planting operations while in a frozen or muddy condition. After spreading to a uniform depth of 6″ minimum, all topsoil shall be raked to remove all extraneous matter. Raked topsoil shall conform to the mechanical analysis specified below and shall be free of stones, lumps, plants or their roots, sticks and similar debris, or any other undesirable material. Topsoil shall not be used in a muddy or frozen condition.

1. All topsoil to be furnished shall be subject to the approval of the Architect. Furnish a certified analysis, made by a recognized authority, of any topsoil that may have to be furnished to complete the work of this section. Test reports shall match the format listed below.

2. Topsoil shall have an acidity range of pH 5.0 to 7.0 and shall contain not less than 6 percent organic matter as determined by loss on ignition of moisture-free samples dried at 100 degrees centigrade. The mechanical analysis of the soil shall be as follows:

Passing	Retained On	Percentage
1" screen		100%
1" screen	¼" screen (gravel)	Not more than 3%
¼" screen	No. 100 USS mesh sieve (sand)	40%-60%
#100 USS	(Very fine sand, silt & clay)	40%-60%

3. Topsoil in which more than 60 percent of the material passing the USS No. 100 mesh sieve consists of clay as determined by the Pouyoucous hydrometer or by the decantation method, shall not be used. All percentages are to be based on dry weight samples. The chemical and mechanical analysis shall state the above items in correct quantities.

4. The Architect reserves the right to take samples of the topsoil from time to time, whether delivered to or stored at the site. These samples will be analyzed for comparison with the Specifications. Should tests show that topsoil does not comply with the Specifications, the material may be rejected or such other remedy made as approved by the Architect in the form of the addition of humus or other supplemental materials.

5. The topsoil mixture materials shall be thoroughly mixed by

hand or by rotary mixer to the satisfaction of the Architect.

B. Sand: Sand shall be ASTM C-33 concrete sand. The sand shall have a fineness modulus of 2.5-3.2 and a coefficient of uniformity of less than 4.

C. Ground Limestone: Ground Limestone (calcium carbonate) shall have the following analysis: at least fifty (50) percent shall pass a 200 mesh sieve; at least ninety (90) percent shall pass a 100 mesh sieve; and one hundred (100) percent shall pass a 10 mesh sieve. Total carbonate shall not be less than eighty-five (85) percent for purposes of calculation, total carbonate shall be considered as calcium carbonate.

D. Organic Fertilizer: Organic fertilizer shall be used for surface application after grass has germinated. Organic activated fertilizer shall contain the following percentage by weight: 5% minimum of nitrogen, 45% phosphoric acid, and other nutritious basic elements.

E. Chemical Fertilizer: Commercial fertilizer shall be used for initial preparation and shall conform to the applicable state fertilizer laws. Commercial fertilizer shall be a complete fertilizer and shall be an organic based product suitable for the establishment of the turf and grass species described herein and/or as noted on the Contract Plans. Examples of acceptable products and Suppliers/Manufacturers are: *PRO-GRO* by *North Country Organics* of Bradford VT., Ph. (802) 222-9661; *LAWN BOOSTER* by *Organica Inc*. of Norristown PA., Ph. 1-888-24GREEN, or locally at (631) 544-0348.

1. Application rate, sequence, and methods shall be as recommended by the manufacturer based on soil conditions of the areas of installation as tested by the Contractor, and on the intended grass stand character (i.e. turf area). The Contractor shall coordinate the review of the recommendations between the Architect, the Manufacturer, and the Contractor’s Installer. Commercial fertilizer application shall be properly coordinated with the application of any other soil amendments that may be necessary.

F. Humus / Compost: Humus shall be of native type and consist of reed peat or sedge peat, but not peat moss, and of such physical condition that it can be readily incorporated with topsoil. It shall be free from sticks, stones, weedy roots, glass or toxic substances or other foreign matter. When delivered from stock piles, humus shall contain between 35 percent and 50 percent moisture. Use only natural domestic humus suitable for soil mulch and of such composition as to furnish ample water holding capacity and retention of plant food. Humus shall be dark brown to black in color, granulated, free of weed seed and lumps and show analysis as follows:

(1) 25 percent - 45 percent moisture by weight as delivered from stockpile.
(2) 5.0 - 7.5 pH (acidity).
(3) Minimum 300 percent water absorbing ability (oven dried at 100 C.).
(4) 85 percent minimum organic matter on dry basis (samples dried at 65 C.).

(5) Low in content of wood material, suphur, iron, or other heavy metals.
(6) Ash, on dry basis: not more than 10 percent.
(7) Soluable salts less than 4.0.
(8) Solvita Maturity number between 6 and 8.
(9) Carbon / Nitrogen ratio - greater than 30:1.
(10) Particle size shall pass a ¼" screen.
(11) Low phosphorous and nitrogen content.

Humus shall be obtained from fresh water site, conditioned in storage piles after excavation for at least 6 months, including one freezing, thawing period.

Certification and Testing: The Contractor shall submit a certificate of materials regarding the composition of the compost from a certified Seal of Testing Assurance Program, Compost Testing Program Laboratory. The test shall be for the actual material to be used on the project, from the stock piles. Stock piles of this material shall be visited by the Landscape Architect, with all expenses paid for by the Contractor.

One such laboratory is located on Long Island:

SOIL FOODWEB NEW YORK, INC.
555-7 Hallock Avenue
Port Jefferson Station, NY 11776
Phone: (631) 474-8848
Fax: (631) 474-8847
info@soilfoodwebnewyork.com

G. Mulch: Weyerhauser "Silva-Fiber", or equal, available from American Excelsior Corporation, Chicago, Illinois.

H. Erosion Control Blanket: Use "Ero-Mat, standard", as manufactured by Verdyol and distributed by Erosion Control Systems, Inc., Tuscaloosa, Alabama; (1-800-942-1986). Install with 11 gauge or heavier steel wire staples with 6 inch long legs and a 1 inch crown. Note: "Ero-Mat, High Velocity" for use on slopes greater than 3:1 and 60 ft. long; or in areas where a high velocity of water is expected - duration is 4-1/2 to 5 feet/second range (in swales).

I. Water for Turf Establishment: Water suitable for turf establishment will be available on-site to the Contractor as coordinated with the Owner. The Contractor shall provide all devices required for the distribution of water (provided by Owner) until turf is fully established. If an irrigation system has been installed or is already in place, this shall serve for distribution. The proper amount and frequency of watering will be the responsibility of the Contractor. In general terms, during dry weather, grassed areas shall be watered daily with sprinklers until grass is firmly rooted.

J. Grass Seed: The Contractor shall furnish and place all materials required for seeding in all topsoiled areas. The seed used shall be fresh, re-cleaned seed of the latest crop, mixed in the following proportions by weight, and meeting the following standards of pure live seed content. The tolerance for PLS (purity x germination)

shall be those called official and tabulated on page 5, US Department of Agriculture Bulletin No. 480.

Grass seed mixes shall be as noted below. Submit mix percentages for approval. Percent pure live seed (PLS) shall be 95% minimum. Maximum percent weed seed shall be .50%. Germination shall be 85% or better.

All seed shall be delivered in the original packages, unopened, which shall include a guaranteed analysis by the vendor. The seeds shall be pre-mixed prior to delivery to the job site, or as otherwise directed by the Architect. The grass seed shall be of the latest crop, mixed in the following proportions by weight:

70% - Tall Fescue
20% - Turftype Ryegrass
10% - Kentucky Bluegrass

All seed shall exhibit minimum 98% Purity and minimum germination of 90%.

Unless specifically indicated otherwise above, the following varieties of turfgrasses shall include:

Tall Fescue: *Rebel, Falcon, Mustang, Jaguar, Houndog.*
Turftype Ryegrass: *Manhattan II, Prelude, Palmer, Omega, Regal*.
Kentucky Bluegrass: *Eclipse, Adelphi, Glade, Sydsport, Baron*.

The rate of seeding shall be as recommended by the supplier/manufacturer for the type of seeds used in the mix and the intended purpose of the planted area. The intent of the Restored Lawn Area seeding is to provide turf lawn to blend in with the areas adjacent to the disturbed area being planted. Supplier shall coordinate the final rate with the Architect, who shall have final authority for approval. Grass seed shall be sown in the fall from August 25 to October 1, or in the spring, between March 15 and May 1. Seeding shall be done in dry or moderately dry soil, and at times when the wind velocity does not exceed 5 mph.

Sowing of Seed: Immediately before any seed is to be sown, the ground shall be scarified as necessary and shall be raked until the surface is smooth, friable and of uniformly-fine texture. Lawn areas shall be seeded evenly with a mechanical spreader, at a rate of 10.0 pounds to 1,000 sq.ft. of ara, lightly raked, rolled with a 200 pound roller and watered with a fine spray. The method of seeding may be varied at the discretion of the Contractor to establish a smooth, uniform turf composed of the grasses specified. Re-seeding shall be done in accordance with this procedure.

Grass seed shall be sown in three different passes by approved machine in such a manner that a uniform stand will result. After seeding, the surface shall be evenly raked with a fine toothed

rake and rolled with an approved roller, as directed by the Architect. Seeding by hydraulic means may be used if approval is obtained from the Architect.

K. Sod: Sod shall be provided where specified within the contract drawings and may be used as an alternative to seed to establish turf in the areas called out for seeding (at no additional cost to the Owner). The Contractor shall request the alternative if it is needed to complete the project in weather not conducive to turf establishment by seeding, or as specified on the drawings. The Architect shall approve the use of the alternative. All sod shall be grown and cut from a sand-based field. Approved sod is superior sod grown from high-quality seed of known origin. Seed is to be inspected by Certification Agency to assure satisfactory genetic identity and purity, overall high quality and free from noxious weeds at time of harvest.

1. The sod shall be of the highest quality, strongly rooted, free from noxious weeds and grubs, mowed to a height not to exceed 3″ prior to lifting, cut in minimum 18" wide x 5' lengths (7-1/2 sq.ft.) to a depth of 1" minimum, or in rolls 4′ wide x 50′ long (200 sq.ft.) and shall be at least one year old. Measurement for thickness shall exclude top growth thatch. It shall be harvested from one field to ensure a uniform color and texture. Sod shall be machine cut. Standard sections of sod shall be strong enough to support their own weight and retain their size and shape when suspended vertically. Sod shall not be harvested or transplanted when moisture content may adversely affect its survival.

2. The mixture of grass seed from which the sod was grown shall consist of approximately the following mixture of permanent grasses: 70% Tall Fescue, 20% Turftype Ryegrass, 10% Kentucky Bluegrass - or - 50% shade tolerant Kentucky Blue Grass - 20% Manhattan II Rye Grass - 30% Pennlawn Fine Fescue (blend as selected by the Architect). All sod shall be inspected prior to delivery.

3. Sod shall be harvested, delivered and transplanted within a period of 36 hours. Before cutting, sod shall be mowed uniformly at a height of 1-1/2 inches.

4. Strength of Sod Sections: Standard size sections of sod shall be strong enough to support their own weight and retain their size and shape when suspended vertically from a firm grasp on the upper 10% of the section.

5. Moisture Content: Sod shall not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.

6. Thatch: Sod shall be relatively free of thatch up top ¼ inch allowable (uncompressed).

7. Diseases, Nematodes and Insects: Sod shall be reasonably free

of diseases, nematodes and soil-borne insects.

8. Weeds: Sod shall be free of objectionable grassy and broad leaf weeds. Sod shall be considered free of such weeds if less than two (2) such plants are found per 200 s.f. of area. Sod will not be acceptable if it contains any of the following weeds: common Bermuda grass (wire-grass), quackgrass, johnsongrass, poison ivy, nutsedge, niblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel and bromegrass.

9. Architect/Engineer may inspect the sod before it is harvested, but reserves the right to reject, on or after delivery, any sod which in his opinion does not meet with the specification requirements.

L. Rootzone Mix Ratio: The rootzone mix shall utilize all existing topsoil stockpiled and shall incorporate an additional 3″ of sand and 1″ of compost at no additional cost to contract.

M. Topdressing: The entire portion of the field not being repaired for low spot filling shall receive a full ½″ of topdressing using organic matter which shall be a mature, stable compost with an organic matter content of 6-8% and be free of glass or toxic substances. This material is available from *Agresource*, called *Agresoil Compost*, and is made from bio solids, not leaf mold. Contact number: 1-800-313-3320.

N. Overseeding: Overseeding shall be accomplished by a drill seeder in three different passes using the following seed mixture:

Percent	Turfgrass Species / Variety	Min. Purity %	Germ. %
70%	Tall Fescue	98%	90%
20%	Turftype Ryegrass	98%	90%
10%	Kentucky Bluegrass	98%	90%

Acceptable varieties of each turfgrass shall include:

Tall Fescue: *Rebel, Falcon, Mustang, Jaguar, Houndog*.
Turftype Ryegrass: *Manhattan II, Prelude, Palmer, Omega and Regal*.
Kentucky Bluegrass: *Eclipse, Adelphi, Glade, Sydsport and Baron.*

Rate of seeding shall be 10 lbs. per 1,000 sq.ft. pf pure live seed (pls.).

PART 3 – EXECUTION

3.01 STRIPPING TOPSOIL

A. All topsoil shall be stripped as described and stockpiled for reuse. No topsoil is to be removed from the site.

3.02 GRADING AND SUBGRADE PREPARATION

A. Perform grading operations to bring subgrade to levels required and to contour indicated on the drawings.

B. Completed subgrade shall be approved by the Architect/Engineer before topsoil and sodding.

C. The approved subgrade shall be scarified to a depth of 2 inches to permit mixing with rootzone material.

D. Where work involved is not in an area designated for regarding, the existing grade shall be rototilled to a depth of 8 inches. The area shall then be leveled and stones raked out.

3.03 ROOTZONE / SEED BED PREPARATION

A. Seasonal and Weather Limitations – All operations including seedbed preparation shall be performed only when the soil is in proper condition to permit satisfactory work. Continuation of work at other than specified times or conditions shall proceed only with consent of the Architect/Engineer.

B. Leveling – Any undulations or irregularities in the surface resulting from tillage or any other causes shall be leveled prior to placing sod. Flooded, washed out or otherwise damaged areas shall be reconstructed and all grades reestablished in conformance with the drawings and specifications.

C. Before any soil is placed, the subgrade shall be graded to a smooth, uniform surface, parallel to and below finished grade. The subgrade surface shall be compacted with an approved roller weighing approximately five hundred (500) pounds, then scarified to a depth of 3″ for proper mix of rootzone material. Hollows, depressions and gullies shall be filled with acceptable material free from stones over two inches (2″) in diameter, cinders, rubbish and other unsuitable material.

D. **New rootzone shall be decompacted to a depth of 12″** prior to seeding or sodding utilizing a ‘BLEC’ Ground Breaker Machine, VertiDrain or equal; on 10″ centers, using 5/8″ wide slits, **12″ deep** to provide compaction relief. Rototilling the fields is specifically excluded.

E. Cleanup – Prior to placing sod, the surface shall be cleared of all trash, debris and stones larger than two inch (2″) diameter, and of all roots, brush, wire, grade stakes and other objects that could be a hindrance to maintenance operations and use.

F. Commercial Fertilizer:

1. Fertilizer for Rootzone Mix: Commercial fertilizer (14-28-15) shall have the following composition by weight: Nitrogen 14%; Phosphorous 28%; Potash 14%; as manufactured by Jonathan Green “New Seeding Lawn Fertilizer”.

2. Fertilizer for Post Seeding/Sodding: 50% slow release commercial fertilizer (28-3-5) shall have the following composition by

weight: Nitrogen 28%; Phosphorous 3%; Potash 5%. The guaranteed analysis shall have a minimum 50% of the total nitrogen as a “slow-release” type.

a. Contractor shall at the direction and discretion of the Architect/Engineer furnished a certified report of an approved analytical chemist, showing the analysis of representative samples of the commercial fertilizer which he proposes to use. All samples are to be taken by the Architect/Engineer, and delivered to the laboratory; the price bid shall include inspection and laboratory charges. No commercial fertilizer shall be delivered until the approval of samples by the Architect/Engineer, but such approval does not constitute final acceptance. The Architect/Engineer reserves the right to reject on or after delivery any material which does not, in his opinion, meet these specifications.

b. Apply new seeding lawn fertilizer at the full rate recommended by the manufacturer for new lawns, using a mechanical spreader, not by hand; Fertilizer shall then be worked lightly into the top 3” of the rootzone material.

c. Apply 50% slow-release type fertilizer as soon as sod has been installed. The first application shall be made at ½ the manufacturer’s recommended rate for new lawns. A second application shall be made at ½ the manufacturer’s rate for new lawns six (6) weeks after the first application of same.

G. Topsoil Placement and Finish Grading:

(1) Topsoil shall be spread on the previously prepared subgrade or surface of select granular fill, scarified to permit proper bonding with the topsoil. The topsoil shall be placed on all specified areas within the Limit Lines shown on the drawings, all areas disturbed by the work of this contract, and as directed by the Architect.

(2) Topsoil shall be raked, properly set and compacted to establish uniform lawn/grass growth, and otherwise manipulated to form, after settlement, smooth draining grades as shown on the drawings. The depth of the topsoil for lawn areas after compaction shall be six inches.

(3) The Contractor shall provide, at his own expense, protection for all topsoil areas against trespassing and damage at all times. Damaged areas shall be treated or replaced as directed by Owner's Representative.

B. Install irrigation system components for initial turf establishment only in accordance with the system manufacturer's instructions, as noted on the Contract Drawings, and as required by local jurisdictional regulations, to provide a fully operational system. In all cases, minimize the disturbance of previously placed materials and repair any damaged sections.

C. If a temporary irrigation system is indicated within the Contract Drawings, it’s installation shall be properly coordinated by the Contractor so as not to affect the seeding process. Temporary systems

shall remain until required stand of grass and percentage germination has been established and maintained for a minimum of two (2) weeks from initial germination.

3.04 SEEDING OPERATIONS:

A. General:

(1) Furnish all materials required for seeding lawn areas in topsoiled areas.

(2) Prior to seeding operations, all areas to be seeded shall be thoroughly disked or otherwise loosened to a depth of 4 inches and shall be carefully raked to true lines free from all unsightly variations, bumps, ridges or depressions, brought to finished grade elevations as shown on the drawings. All sticks, stones, roots or other objectionable material which might interfere with the formation of a finely pulverized seed bed shall be removed from the soil. Two pounds of 15-20-10 formula commercial fertilizer per cu.yd. shall be thoroughly mixed with the topsoil or not less than 10 lbs. per 1,000 sq.ft. of lawn surface, whichever is the greater.

(3) Seeding:

a. Purpose: To provide permanent vegetative cover and to control storm water run-off and erosion.

b. Where Applicable: All areas not covered by buildings and pavement within the limit lines as shown on the contract plans, and all other existing lawn areas disturbed or damaged by the work of this contract.

(4) All areas to be seeded in lawn shall be thoroughly disked or otherwise loosened to a depth of four (4) inches and shall be raked to true lines, free from all unsightly variations, bumps, ridges or depressions. As specified, all sticks, stones, roots or other objectionable material that might interfere with the formation of a finely pulverized seed bed shall be removed from the soil. Ground limestone, humus and commercial fertilizer shall be applied as specified:

(5) Apply ground limestone uniformly at a minimum rate of 100 pounds per 2,000 square feet, or as determined by analysis. The ground limestone shall be distributed evenly, by machine, over all areas to be seeded. It shall be worked lightly into the top three (3) inches of the soil, at least five (5) days before applying fertilizer.

(6) Apply fertilizer uniformly at a minimum rate of 10 pounds per 1,000 square feet. Fertilizer to be 10-10-10. Apply humus at the rate of 3-1/3 cubic yards per 1,000 square feet. Note: Application rate, sequence, and methods shall be as recommended by the manufacturer based on soil conditions of the areas of installation as tested by the Contractor, and on the intended grass stand character (i.e. turf area). The Contractor shall coordinate the review of the recommendations between the Architect, the Manufacturer, and the Contractor’s Installer. Commercial fertilizer application shall be

properly coordinated with the application of any other soil amendments that may be necessary.

(7) Work lime, fertilizer and humus into soil to a minimum depth of 3 inches using any suitable equipment.

(8) The soil shall then be raked to a smooth, even draining surface and properly set and compacted to establish uniform lawn/grass growth with an approved roller or as otherwise directed by the Architect. Manipulate to form, after settlement, smooth draining grades as shown on the drawings. Any depressions which occur shall be re-graded and re-rolled until a satisfactory grade is obtained.

(9) Time of Seeding: Grass seed shall be sown preferably in the fall between August 15th and October 1st or in the spring between April 1st and May 15th, or at such other times as are approved by Owner's Representative. All seeding is to be done in dry, or moderately dry soil and at times when the wind does not exceed a velocity of five miles per hour.

(10) Seed shall be sown at the rate as recommended by the supplier/manufacturer for the type of seeds used in the mix and the intended purpose of the planted area. The intent of the Restored Lawn Area seeding is to provide turf lawn to blend in with the areas adjacent to the disturbed area being planted. Supplier shall coordinate the final rate with the Architect, who shall have final authority for approval. Grass seed shall be sown in the fall from August to October, or in the spring, between March and May. Seeding shall be done in dry or moderately dry soil, and at times when the wind velocity does not exceed 5 mph. Grass seed shall be sown by approved machine in such a manner that a uniform stand will result. After seeding, the surface shall be evenly raked with a fine toothed rake and rolled with an approved roller, as directed by the Architect. Seeding by hydraulic means may be used if approval is obtained from the Architect.

B. Hydroseeding Option: The Contractor may utilize a hydroseeding option, as indicated above. If hydroseeding shall be supplied as a zero-cost option to the Owner, the Contractor shall supply the name, address and contact information of his hydroseeding subcontractor to the Architect for contact and discussion. The hydroseed blend to be submitted by the Contractor shall be equal and comparable to the standard seed blend(s) indicated within this specification section for the intended turf establishment. The blend shall be submitted to the Architect in advance as a part of the shop drawings submittal process.

3.05 MULCHING:

A. All seeded areas shall be covered with approved mulch not later than 3 days following seeding. Ground surfaces shall be completely covered at the rate of at least 2 tons an acre. The Contractor shall utilize a Bowie Hydromulcher or equal to apply all mulch.

B. All areas to receive permanent seeding shall be mulched as described in the specifications and as noted herein.

C. On slopes 4 horizontal to 1 vertical, or greater, and in drainage swales, mulch shall be anchored using erosion control blanket or other approved netting properly fastened in place. Install rolls in proper direction with overlap and staple pattern set in accordance with the manufacturer's requirements.

D. In any event, the Contractor is responsible for mulch remaining intact until grass has germinated and has reached a minimum height of one inch.

3.06 SODDING:

A. The Contractor shall furnish and place all materials required for sod in all topsoiled areas. The sod may be installed at any time between August 15th and June 1st when the ground is not frozen. Sod shall be placed only when weather and soil conditions are suitable for proper knitting and development of sod. Sod shall not be placed on a muddy rootzone or during periods of extreme heat. No sod shall be installed without approval of the Architect. All areas to receive sod shall be thoroughly disked or otherwise loosened to a depth of 4 inches and shall be raked to true lines free from all unsightly variations, bumps, ridges, or depressions. All sticks, stones, roots or other objectionable material which might interfere with the formation of a finely pulverized seed bed shall be removed from the soil.

B. The sod shall be placed on a minimum of 4" of properly compacted topsoil. The sub grade of topsoil shall be graded so that after the sod is placed, the finished grade shall meet existing grades specified by the Architect. The soil shall be raked to a smooth, even-draining surface, and compacted with an approved roller as directed by the Architect/Engineer. Any depressions which occur shall be re-graded and re-rolled until a satisfactory grade is obtained.

C. Before the sod is placed, an application of super-phosphate shall be applied to the sub-grade topsoil at the rate of 20 pounds per 1,000 square feet and raked into a depth of 1 inch.

D. Starter Strip; The first row of sod should, if possible, be laid in a straight line with subsequent rows placed parallel and tightly against one another. Lateral joints shall be staggered to promote a more uniform growth and strength. Care shall be exercised to ensure that the sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would permit air drying of the roots. The sod shall be placed in 18" x 5' lengths and rolled with at least a 200-pound roller; as the sod is completed in any one section, the entire area shall be rolled. After rolling, the finished grade shall conform evenly to the grades on the plan or according to given grades by the Architect. The sod shall then be thoroughly watered to a depth sufficient that the underside of the new sod pad and soil immediately below are thoroughly wet.

E. Watering During Installation: During periods of high temperature, the sod shall be lightly watered to prevent wilting during the progress of the work; as sod is completed in any one section, the entire section shall be thoroughly irrigated to a depth of 5 inches or more. In general, the sod shall be thoroughly watered until the root system has become sufficiently knit, at which time the Contractor will be relieved of his responsibility

for maintenance and watering. Watering apparatus shall then be removed by the Contractor.

F. Joint Dressing: As soon as practical following the initial watering, but in every case prior to the second watering, the entire area shall be examined for open joints or other signs of surface imperfections. Any open joint or other voids shall be carefully filled with sand to prevent air drying of the roots and to eliminate undulations in the surface.

G. The first mowing shall not be attempted until the sod is firmly rooted and secure in place. Not more than 40% of the grass leaf shall be removed by mowing. Grass height shall be maintained between 1-1/2" and 2-1/2" until final acceptance and completion of the whole work under this contract. Any unsatisfactory sod shall be removed and replaced at the Contractor's expense.

3.07 RECONDITIONED LAWNS

A. Recondition existing lawn areas damaged by the Contractor’s operations, including storage of materials or equipment and movement of vehicles. Also, recondition lawn areas where settlement or washouts occur or where minor regrading is required.

    1. Recondition other existing lawn areas.

B. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from the Contractor’s operations, including oil drippings, fuel spills, stone, gravel and other construction materials, and replace with new topsoil.

C. Where substantial lawn remains, mow de-thatch, core aerate and rake. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. DO not use pre-emergent herbicides.

D. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation and turf, and legally dispose of it off the Owner’s property.

E. Till stripped, bare and compacted areas thoroughly to a depth of 6 inches.

F. Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches of soil. Provide new planting soil as required to fill low spots and meet new finish grades.

G. Apply seed and protect with straw mulch as required for new lawns.

H. Water newly-planted areas and keep uniformly moist until new grass is established.

3.08 WATERING

A. The Contractor shall be responsible for the proper watering for all sodded areas until Substantial Completion of the work as hereinafter specified. The proper amount and frequency of watering will be the sole responsibility of the Contractor.

B. In the absence of adequate rainfall, watering shall be performed daily during the first week, and shall be sufficient to maintain moist soils to a depth of at least 5 inches. Water should be applied immediately if at any time the sod shows indications of wilting.

C. Subsequent Watering: Sod shall be watered as required to maintain adequate moisture in the upper 5 inches of soil. In the absence of rainfall, sod shall be watered at frequencies dictated by need.

3.09 CLEAN-UP

A. Soil, manure, peat or similar material which has been brought onto paved areas by hauling operations or otherwise shall be removed promptly, keeping these areas clean. Upon completion of the planting, excess stones and debris, which has not been previously cleaned up, shall be removed from the site or disposed of as required by the Architect, except topsoil shall be spread or piled on the site as directed by the Architect. Lawns and planting areas shall be prepared for final approval.

3.10 MAINTENANCE, REPLACEMENT, GUARANTEE AND FINAL INSPECTION:

A. Maintenance operations shall begin immediately after the seed is sown/sod installed and shall be continued as required until Substantial Completion. Grass shall be kept in healthy growing condition by mowing, watering, weeding, cultivating, disposal of waste vegetation, fertilizing, spraying or spreading of approved materials to prevent or treat infestations of insects or disease and all other operations required to produce and maintain a strong, vigorous and healthy stand of grass. Lawn areas shall be mowed to a height of 2 inches whenever the average height of grass is over 3 inches. When the amount of cut grass is heavy, it shall be removed to prevent the destruction of the underlying turf.

B. Seeded or sodded areas that are determined to be dead within warranty period, or in the opinion of the Architect, in an unhealthy, unsightly, or badly impaired condition, shall be replaced by the Contractor as soon as reasonably possible after the unsatisfactory condition has been evident. No replacement shall be made in any season definitely unfavorable for seeding or sodding. Such replacements shall be made in the same manner as specified for the original seeding or sodding.

C. Seeded Lawns: Seeded lawns shall be protected and maintained by watering, mowing and replacing for 60 days or as long as may be necessary to produce a uniform stand of grass. After grass is up, it shall be top-dressed with organic lawn fertilizer. Maintenance shall continue until a uniform turf is established. For the purpose of establishing an acceptable standard, scattered bare spots, none of which is larger than one square foot, will be allowed up to a maximum of 3 percent of the lawn area. Areas not meeting this requirement will be reseeded.

D. Sodded Lawns: Sodded lawns shall be protected and maintained for 30 days or as long as necessary for the roots to be firmly established.

E. Surface Application of Fertilizer: Spread a second application of organic lawn fertilizer at the end of the maintenance period for both seeded and sodded lawns. Spreading rate shall be as recommended by the manufacturer.

    a. Sodded Areas: Use 18-5-9 or 12-4-8.
    b. Seeded Areas: Use 18-5-9 or 24-6-8.
        i. The second application of fertilizer shall be witnessed by the Owner or his representative, and a signed document shall be submitted to the Architect certifying the Work has been performed. The document shall be signed by the installer and the Owner’s or Architect’s witness.

F. Provide labor and equipment for maintenance, including the necessary watering and mowing equipment to meet the requirements herein established.
    a. The Owner will furnish the water used to maintain the lawns as specified.

G. Turf must have had a minimum of three (3) mowings before a request for acceptance can be considered.

H. Initial inspection of the seed or sod work to determine Substantial Completion of the work will be made by the Architect upon written notice requesting such inspection submitted by the Contractor at least 10 days prior to the anticipated date of inspection. Request may be made subsequent to the third mowing of the turf.

I. Acceptance: After inspection, the Contractor will be notified in writing by the Architect/Engineer of Substantial Completion of all work, or, if there are any deficiencies, of the requirements for completion of the work. Work remaining to be done or redone will be subject to re-inspection before Substantial Completion is given.

J. All seeded and sodded areas shall be guaranteed for a period of one full year / one complete growing season, commencing with the date of Substantial Completion.

K. Upon Substantial Completion, the Owner will assume general responsibility for maintenance of the lawn areas. The Contractor shall, however, make monthly visits to the site during the guarantee period to advise the Owner of proper maintenance procedures. No additional payment shall be made for visits. Price bid for the work of this trade shall include costs of visits.

L. Failure of the Contractor to notify the Architect/Engineer, in writing, of inadequate maintenance by the Owner of the lawn areas installed under this contract shall constitute acceptance of the Owner's maintenance operations by the Contractor. The Contractor shall not, therefore, use the Owner’s alleged lack of proper maintenance as a basis for voiding his responsibilities under the guarantee herein specified.

M. At the expiration of the guarantee period, upon written request of the Contractor, inspection for Final Acceptance will be made by the Architect/Engineer. All remedial work to turf areas by the Contractor shall be completed prior to the request for Final Acceptance.

3.11 GUARANTEE / REPLACEMENT

A. The Contractor guarantees, by acceptance of the Contract that all work installed will be free from any and all defects in workmanship and/or materials and that all apparatus will develop capacities and characteristics specified. If, during the period of one (1) year, or as otherwise specified, from date of the certificate of completion and acceptance of the work, should any defects in workmanship, material or performance appear, he will, without cost to the Owner remedy such defects within a reasonable time to be specified in writing by the Architect. In default thereof, the Owner may have such work done and charge cost to the Contractor.

B. The Contractor shall provide the Architect a written guarantee covering fully the one (1) year guarantee period. Lawns shall be warranted for the minimum duration of one full year, to include one full growing season after seeding and sodding, and shall be alive and in satisfactory growth at the end of the warranty period. The growing season is defined as beginning May 1 and ending October 1.

C. At the expiration of the guarantee period, upon written request by the Contractor, inspection for Final Inspection will be made by the Architect. All remedial work to seeding by the Contractor shall be completed prior to the request for final inspection. If lawns do not show a healthy, uniform stand of grass, those areas shall be re-seeded or re-sodded as soon as conditions permit, but during the spring or fall seeding periods.

D. Owner’s Responsibility: If an area of seeding or sodding during the warranty and replacement period is found to be damaged or destroyed due to vandalism, malicious mischief, vehicle ruts and tracks, or acts of God such as flooding, storm debris, etc., then the Owner shall have the responsibility of replacing those lawn areas without cost or responsibility to the Contractor.

END OF SECTION

DIVISION 2 - SITE WORK

SECTION 02832 – VINYL COATED CHAIN LINK FENCING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section as though bound herein.

1.02 SUMMARY

A. The work includes all labor, materials, equipment, and appliances necessary to furnish and install the various height chain link fences and gates as shown on the plans, detailed in the specifications, and directed by and to the approval of the District.

1.03 RELATED SECTIONS

A. Section 02000 – Sitework General Provisions
B. Section 02200 - Earthwork
C. Section 02801 – Topsoil, Lawns and Grasses
D. Section 03300 - Cast-in-Place Concrete

1.04 SUBMITTALS

A. Comply with the requirements of Section 01300 and as modified below.

B. Manufacturer's Data:

1. Submit copies of manufacturer's product data, specifications, installation instructions, and copy of manufacturer’s warranty.

B. Shop Drawings: Layout of items with dimensions, details, recommended footing details, finishes of components, and accessories.

PART 2 - MATERIALS

2.01 FENCE MATERIALS

A. Fabric: The fabric shall have knuckled edges at the top and bottom and shall be fastened to the top rail, middle rail and bottom rail when provided, which shall be run through loop caps.

1. PVC coating bonded and thermally fused to metallic coated steel core wire: ASTM F668 Class 2b, 7 mil thickness. Core wire tensile strength 75,000 psi. 2" diamond mesh, 9 gauge core wire with a diameter of 0.148" and a breakload of 1,290 lbs except where noted differently on the plans.

B. Posts: Line, terminal (corner and end), and gate posts shall be a minimum of 3'-8" greater in length than the fabric height in order to be embedded in 3'-6" deep concrete footings.

1. Line Posts: Line posts shall be 2.5 inch O.D. steel pipe, weight 3.65 lbs. per foot, copper bearing and hot dip galvanized; PVC-Coated finish in accordance with ASTM F1043; supplemental color coating of 10-15 mils of thermally fused PVC in color as selected by the Architect. Complete with all necessary fittings.

2. Terminal Posts: End and corner posts shall be 3.0-inch O.D. steel pipe, weight 5.79 lbs. per foot, copper bearing and hot-dip galvanized; PVC-Coated finish in accordance with ASTM F1043; supplemental color coating of 10-15 mils of thermally fused PVC in color as selected by the Architect. Complete with all necessary fittings.

3. Gate Posts: Gate posts shall be copper bearing steel, hot-dip galvanized; PVC-Coated finish in accordance with ASTM F1043; supplemental color coating of 10-15 mils of thermally fused PVC in color as selected by the Architect. Complete with all necessary fittings. Conforming to the following sizes, except where noted differently on the plans:

   a. Gate leaf up to 3 ft. wide: Schedule 40, 2.875" o.d., 5.79 lbs. per lineal foot.

   b. Gate leaf over 3 ft. to 5 ft. wide: Schedule 40, 4.0" o.d., 9.10 lbs. per lineal foot.

   c. Gate leaf over 5 ft. to 10 ft. wide: Schedule 40, 6.625" o.d., 18.97 lbs. per lineal foot.

C. Gates: Gate frames shall be 2.0-inch O.D., copper bearing fabric to match the fence line. All frames shall be hot-dipped, galvanized 1.8 oz. zinc/s.f. uncoated surface, conforming to ASTM 120, Schedule 40. PVC-Coated finish in accordance with ASTM F1043; supplemental color coating of 10-15 mils of thermally fused PVC in color as selected by the Architect. All gates to be provided with necessary hinges and gate padlock fittings. Provide diagonal bracing when gate leafs are over 4'-0" wide.

D. Bracing: Braces not less than 1 5/8-inch O.D., weighing not less than 2.27 lbs. per foot, or approved equivalent section, complete with 3/8-inch galvanized truss rod and turnbuckle, all PVC coated, shall be installed at all corner, end, and gate posts, and as required at changes of vertical grade.

E. Post Tops: All posts shall be fitted with heavy malleable iron or pressed steel tops, PVC coated. Tops shall permit passage of top rails.

F. Bottom & Middle Rails: Bottom shall be 1 5/8-inch O.D., copper bearing steel pipe, hot-dipped, galvanized, weight 2.27 lbs. per foot. PVC-Coated finish in accordance with ASTM F1043; supplemental color coating of 10-15 mils of thermally fused PVC in color as selected by the Architect. Bottom rail shall be installed between posts with appropriate fittings and accessories.

G. Top Rail: Top rail shall be 1 5/8-inch O.D., copper bearing steel pipe, hot-dipped, galvanized, weight 2.27 lbs. per foot. PVC-

Coated finish in accordance with ASTM F1043; supplemental color coating of 10-15 mils of thermally fused PVC in color as selected by the Architect. Top rail shall pass through the line post tops and form a continuous brace from end to end of each run of fence. Couplings shall be outside sleeve type and at least seven inches long; one coupling every five shall contain a heavy spring to take up expansion and contraction of the top rail.

H. Truss Rods: Galvanized steel rods, 5/16″ min. diameter.

I. Tension (stretcher) bars: one piece lengths 2″ shorter than fabric height, 3/16″ x 3/4″, hot dip galvanized, PVC coated.

J. Wire ties and clips: 9 gauge galvanized steel wire for attachment of fabric to line posts. Double wrap 13 gauge for rails and braces. Hog ring ties of 12 1/2 gauge for attachment of fabric to tension wire. All PVC coated

K. Nuts and bolts are galvanized but not vinyl coated. Utilize PVC paint color coat nuts and bolts.

L. Fence Post Footings:

1. The line, corner, and end gate posts shall be as detailed on the plans. All concrete footings shall be 3,000 psi., air-entrained. Footings shall be crowned to shed water and protect posts at ground line.

a. If footings are not detailed on plans, they shall be provided with a diameter 4 times greater than the outside dimension of post, 3′-6″ deep, or deeper as the post condition warrants.

2.02 TENNIS COURT WINDSCREEN

A. Provide tennis court windscreens at full perimeter of tennis courts if the work of this section is related to tennis court construction as indicated on the drawings.

1. Manufacturer: Douglas Industries, Eldridge, Iowa.

a. Model: VCP-9 Windscreen

2. Fabric:

a. Open mesh vinyl-coated (50%) polyester with 70% windbreak, 320 x 200 tensile strength, 9 x 12 inch weave, 7 oz. per square yard. Color as selected by Architect.

b. 3 ply hems, vinyl coated polyester reinforced and double sewn with heavy duty polyester thread.

c. No. 2 brass grommets.

d. Douglas AVR reinforced, die-cut, heat sealed air vents

3. Fasteners:

a. lightweight, self-locking plastic fasteners with 150lb.

break strength, C-snaps, and lacing cord.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify areas to receive fencing are completed to final grades and elevations.

B. Ensure property lines and legal boundaries of work are clearly established.

3.02 CHAIN LINK FENCE FRAMING INSTALLATION

A. Install chain link fence in accordance with ASTM F567 and manufacturer's instructions.

B. Concrete Set Posts: Drill hole in firm, undisturbed earth to approximately 6" deeper than post bottom. Excavate deeper as required for adequate support in soft and loose soils, and for posts with heavy lateral loads. Set post bottom 36" below surface when in firm, undisturbed soil. Place concrete around posts in a continuous pour. Trowel finish around post. Slope to direct water away from posts.

1. Line posts shall be spaced at uniformly at approximately 8 ft. o.c., maximum of 10’-0” o.c., unless otherwise noted.

2. Terminal posts shall be located at each fence termination and change in horizontal or vertical direction of 30 degrees or more.

    a. Install horizontal pipe brace at mid-height for fences 6’ and taller, at first section on each side of terminal, corner, and gate posts. Firmly attach with appropriate fittings. Install diagonal truss rods at these points. Install braces and adjust truss rod, ensuring posts remain plumb.

C. Check each post for vertical and top alignment, and maintain in position during placement and finishing operation.

E. Rails: Continuous top rails in 21 ft. sections. Bottom and mid rails (if required), single lengths between posts.

1. Install mid-rails for fabric heights of 10 ft. and over.

F. Gates: Install gates plumb, level and secure for full opening without interference. Attach hardware by means which will prevent unauthorized removal. Adjust hardware for smooth operation.

3.03 CHAIN LINK FABRIC INSTALLATION

A. Fabric: Install fabric on court or field side of fence posts and attach so that fabric remains in tension after pulling force is released. Leave approximately 1" between finish grade and bottom selvage. Attach fabric with 9 ga. galvanized PVC coated wire ties or clip to line posts at 12" on center and to rails, braces, and tension wire at 12" on center.

B. Tension (stretcher) bars): Pull fabric taut; thread tension bar

through fabric and attach to terminal posts with bands spaced maximum of 15" on center.

3.04 ACCESSORIES

A. Tie wires: Bend ends of wire to minimize hazard to persons and clothing.

B. Fasteners: Install nuts on fence side opposite fabric side for added security.

3.05 CLEANING

A. Clean up debris and unused material, and remove from site.

3.06 RESTORATION

A. Any areas of the project site that are disturbed by the work shall be restored to the condition in which they existed prior to this work.

B. Grass areas disturbed by this work shall be restored with topsoil & seed.

END OF SECTION

DIVISION 3 - CONCRETE

SECTION 03300 – CAST-IN-PLACE CONCRETE WORK

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.02 SCOPE/SUMMARY

A. In general, the extent of concrete work is shown on the drawings. Provide all labor, materials, equipment, services, and perform all operations required to complete the installation of all work of this section and related work as indicated on the drawings and specified herein, including, but not necessarily limited to, the following:

1. Concrete footings, pile caps, grade beams, foundations, and walls.

2. Concrete steps, platforms, ramps, equipment pads.

3. Interior concrete slabs on grade or fill and elevated slabs.

4. Exterior concrete on grade: Curbs, walks, plazas, stairs, ramps and driveway aprons.

5. Expansion, control and isolation joints in concrete work.

6. Porous fill and vapor barrier for slabs on grade or fill.

7. Floor hardening treatment for interior exposed cement floors and base.

8. Grouting of bearing plates, leveling plates, miscellaneous lintels, and equipment supported on concrete.

9. All forms and reinforcing required for work of this section.

10. Cut, patch, finish, and point concrete and cement work.

11. Pre-molded filler at intersection of floor slabs and exterior wall, and where otherwise indicated (typical at all points abutting vertical surfaces.

12. Installation of water stop material where indicated when necessary.

B. Work not included: The following items of related work are specified in other sections or contracts.

1. Furnishing of hanger inserts, anchors, leveling plates,

sleeves, conduits, etc.

2. Waterproofing and damp proofing.

1.03 RELATED SECTIONS

A. Related Sections:

1. 01352 – LEED and Sustainable LEED Requirements
2. 01450 – Testing Laboratory
3. 01451 - Tests, Inspections, Special Inspections, Quality Assurance Plan
4. 01524 – Construction Waste Management
5. 02105 – Stake Out
6. 02200 – Earth Work
7. 03650 – Underlayment Concrete
8. 04200 – Unit Masonry
9. 05120 – Structural Steel
10. 06100 – Rough Carpentry
11. 07140 – Metal Oxide Waterproofing
12. 07160 – Bituminous Dampproofing
13. 07190 – Under Slab Vapor Barrier
14. 07200 – Building Insulation

1.04 SUBMISSIONS

A. All submissions to be made in accordance with Section 01300 Submissions.

B. A concrete mix design: Submit laboratory test reports of concrete materials and mix design for each strength of concrete required on the project. Design data shall clearly identify the testing laboratory and provide 28 day strength testing reports representing mix proposed inclusive of all admixtures.

1. Mix design shall also include the following information;

a. Minimum design strength intended.
b. Cement content
c. Water content
d. Slag content
e. Water cement ratio
f. Maximum aggregate size
g. Coarse aggregate content
h. Fine aggregate content
i. Air entrainment by volume
j. Adjustment for aggregate moisture slump
k. Tested flexural strength
l. Tested compressive strength

2. Additional inclusions if required on job:

a. Admixtures
b. Water reducers
c. Accelerators

d. Retarders
e. Fibers
f. Colorants
g. Special purpose admixtures
h. Corrosion inhibitor
i. Viscosity modifiers

C. Product Data: Submit manufacturer's product data for all materials and items required for the proposed Scope of Work. Including, but not limited to: concrete mix components, reinforcement and forming accessories, wall sleeves, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, hardener/sealers, vapor barriers, non-shrink grit, etc. Product data for materials and items not listed above will be submitted upon the request of the Architect.

D. Shop Drawings-Reinforcement: Submit complete and accurate shop drawings for approval before any work is executed. The shop drawings submitted by the Contractor shall be independently prepared for him by a Professional Engineer licensed to practice in the State of New York or otherwise within the state where the project is to be constructed and shall completely show the following:

1. Foundation plans and details, including but not limited to: pier plan details, stair sections, exterior wall elevation drawings which show all reinforcing, top of wall elevations, brick shelves & shelf elevations, tops of piers, bottom of footings, stepped footings and elevation changes, bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

2. Floor slab plan indicating elevation variations, recesses, control joints, isolation joints, expansion joints and any proposed cold joints and details of each.

3. Bending and tying diagrams, including typical corners,

4. Sizes and spacing of members, relationship to contiguous work, fabrication, bending, and placement of concrete reinforcement.

5. General notes and legends as required.

6. Drawings shall comply with the latest version of ACI 315 Details and Detailing of Concrete Reinforcement.

7. Any and all other pertinent information.

8. Shop drawings must be signed and sealed by licensed professional engineer.

E. Samples: Submit samples of materials only if requested by the Architect, including names, sources, and descriptions.

F. Material Certificates: Provide material certificates in lieu of laboratory test reports when permitted by Architect. Material certificates shall be signed by the NYS-licensed Professional Engineer who prepared the shop drawing submittal, certifying that each material item complies with, or exceeds, specified requirements.

G. LEED Submittals, for LEED projects submit the following:

1. Submit recycled content and regional materials documentation for each type of product provided under work of this Section in accordance with Section 01352 "LEED Requirements."

2. Credit MR 7: If plywood forms are used, Contractor must submit documentation that the plywood used contains no urea-formaldehyde and that the plywood meets the requirements of LEED MR Credit 7, Certified Wood, by providing wood certification documentation, including chain-of-custody documentation from the manufacturer declaring conformance with the Forest Stewardship Council (FSC) guidelines for certified wood building components.

3. Manufacturer's verification that steel reinforcement contains at least 90% combined post-consumer and post-industrial recycled content.

4. Manufacturer's verification that VOC content of interior concrete sealer is less than 250 g/L.

1.05 GENERAL REQUIREMENTS AND QUALITY ASSURANCE

A. Codes and Standards: Comply with the provisions of the latest version of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:

1. Concrete Reinforcing Steel Institute (CRSI), *"Manual of Standard Practice."*

2. American Society for Testing and Materials (ASTM) Latest Versions:

a. ASTM C 33 *"Specification for Concrete Aggregates."*

b. ASTM C 39 *"Test Method for Compressive Strength of Cylindrical Concrete Specimens."*

c. ASTM C 42 *"Methods of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete."*

d. ASTM C 94/C94 M-00 *"Standard Specification for Ready-Mix Concrete."*

e. ASTM C 150 *"Specification for Portland Cement."*

f. ASTM A 185 *"Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement."*

g. ASTM C 260 *"Specification for Air-Entraining Admixtures for Concrete."*

h. ASTM C 309 *"Specification for Liquid Membrane-Forming Compounds for Curing Concrete."*

i. ASTM A 615 *"Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement."*

3. American Concrete Institute (ACI): Latest Versions

a. ACI 117 *"Standard Tolerances for Concrete Construction and Materials."*

b. ACI 211 "Recommended Practice for Selecting Proportions Concrete."

c. ACI 301 "Specifications for Structural Concrete for Buildings."

d. ACI 302 *"Guide for Concrete Floor and Slab Construction."*

e. ACI 304 *"Recommended Practice for Measuring, Mixing and Placing Concrete."*

f. ACI 305 *"Hot Weather Concreting."*

g. ACI 306 *"Cold Weather Concreting."*

h. ACI 315 *"Details and Detailing of Concrete Reinforcement."*

i. ACI 318 *"Building Code Requirements for Reinforced Concrete."*

j. ACI 347 *"Recommended Practice for Concrete Formwork."*

B. Quality Control Testing During Construction:

1. The Owner will employ an independent testing laboratory to perform tests and to submit test reports. The contractor will be responsible for contacting the testing laboratory to arrange for all sampling, observation and testing. The Owner will pay for all passing tests; all failed tests and any additional testing required due to failed tests will be the responsibility of the contractor.

2. Sampling and testing for quality control during placement of concrete shall include the following as appropriate to scope, as directed by the Architect and in coordination with Section

01451.

3. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.

   a. Slump: ASTM C 143; one test at point of discharge per truckload or batch of each type of concrete; additional tests when concrete consistency seems to have changed. See 2.05G for slump limits.

   b. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure method for normal weight concrete; one for each days' placement of each type of air-entrained concrete.

   c. Concrete Temperature: Test hourly when air temperature is 40°F (4°C) and below, and when 80°F (27°C) and above; and each time a set of compression test specimens are made.

   d. Compression Test Specimen: ASTM C 31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.

   e. Compressive Strength Tests: ASTM C 39; one set for each day's placement exceeding 5 cu. yds. plus additional sets for each 50 cu. yds. over and above the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.

      1. When frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than five are used.

   f. When total quantity of a given class of concrete is less than 50 cubic yards, strength test may be waived by Architect if, in his judgement, adequate evidence of satisfactory strength is provided.

   g. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.

   h. At the discretion of the Architect the strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls

below specified compressive strength by more than 500 psi.

4. Test results will be reported in writing to the Architect, Structural Engineer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions, and materials, compressive breaking strength and type of break for both 7-day tests and 28-day tests.

5. Non-destructive Testing: Impact hammer, sonoscope, or other non-destructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

6. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by the Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.

C. The Contractor shall provide a storage box to be used exclusively for the storage and curing of concrete test specimens. This box shall be substantially constructed, made of 1" thick T & G lumber, well braced to prevent warping, or 1/2" thick plywood (exterior grade) may be used. Box shall be provided with a hinged cover and padlock. Storage box shall be so constructed and located on the project site that its air temperature when containing concrete specimens will remain between 60° and 80°F. During the first 24 hours that any test specimens are in the box, electric heating cables or other approved means shall be provided to maintain this temperature during freezing weather. The storage box shall be placed on the site where approved, in location such that it will not be subject to any vibration or disturbance. Storage box shall not be placed in any building or shanty while it is being used for storing specimens.

D. Should the average strength of the test cylinders fall below the required strength, the Architect may require changes in the proportion to apply to the remainder of the work or may require load tests and/or cores at the Contractor's expense on the portion of the structure which fails to develop the required strength or may require additional curing, the load test shall conform to the requirements of the Building Code Requirements for Reinforced Concrete (ACI 318, latest edition). If the concrete does not meet the specified requirements, the Architect may condemn such concrete already in place and the Contractor, at his own expense, shall remove such condemned concrete and replace same with new concrete to the satisfaction of the Architect. Use of high early strength cement will not be permitted without written approval of the Architect.

1.06 PROJECT CONDITIONS

A. General: The contractor shall ensure that all proper project conditions are in place, ready for the setting of forms, reinforcement and subsequent concrete pouring, prior to the commencement of the work. Commencement of work constitutes contractor acceptance of all existing conditions.

1.07 CONTROLLED CONCRETE

A. Concrete shall be composed of Portland Cement, fine aggregate, coarse aggregate, and water or as otherwise composed via approved mix design.

1. Additional materials may include: slag, admixtures, fibers, colorants, or special purpose admixtures.

B. All concrete, unless otherwise specified or called for on the drawings, shall be controlled concrete as defined and regulated in the local building code and by the American Concrete Institute and its **ultimate compressive strength at the end of 28 days shall be not less than 4,000 pounds per square inch for foundations, walls and footings, 4,500 pounds per square inch for slabs-on-ground elevated slabs, and other building concrete, and 4,500 pounds per square inch for exterior concrete including, but not limited to, sidewalks, stairs, ramps, driveway aprons and curbing, unless otherwise indicated on structural drawings.**

C. Before the work is begun, the Contractor shall have preliminary trial tests made by a laboratory approved by the Architect to determine the mixture required to give the strength specified. Concrete shall be designed in accordance with the A.C.I. *Standard Recommended Practice for Selecting Proportions for Concrete* (ACI-513) to produce the strength required. Concrete shall be so designed that the concrete materials will not segregate nor shall excessive bleeding occur. Tests shall be made in accordance with ASTM C-39. The laboratory trial mixture for each mix design shall develop a concrete of compressive strength at 28 days of 1,200 psi higher than the required minimum for each of the strengths indicated to be acceptable for use in the field, but in no case shall cement content be less than 6 bags per cubic yard for 4,000 psi and 6 1/2 bags for 4,500 psi concrete. The proposed mixture must be approved by the Architect before the Contractor proceeds with the work.

D. Upon approval by the Architect, the Contractor will be allowed to proceed with the work if the laboratory trial mixture develops a compressive strength of 70% of the required ultimate strength at the end of seven (7) days.

E. If, during the progress of the work, it is found that the required workability and strength cannot be attained with the materials furnished by the Contractor, the Architect may order such changes in proportions or materials or both as may be necessary to secure the desired properties.

F. The proportions of aggregate to cement shall be such as to produce a mixture which will work readily into the corners and around reinforcement but without permitting the materials to segregate or excess free water to collect on the surfaces. The combined aggregates shall be of such composition of sizes that when separated on the No. 4 standard sieve, the weight passing the sieve (fine aggregate) shall be not less than 40% or greater than 50% of the total, unless otherwise directed. Maximum size of coarse aggregate in slab, beams, and columns shall be 3/4" and in walls and footings 1 1/2".

G. The source of supply of the aggregate shall not change during the course of the job without previous notice to the Architect, and the materials from any new source shall be subject to acceptance or rejection based upon tests to be made by the Testing Laboratory at the Contractor's expense.

1.08 DELIVERY, STORAGE AND HANDLING

A. Protect materials delivered from the elements and from otherwise being damaged on site.

B. Any materials damaged on site due to improper delivery, storage or handling shall not be incorporated in the project and shall be replaced at no cost to the Owner.

C. Deliver, store and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.01 FORM MATERIALS

A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.

B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

D. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units which will leave no metal closer than 1-1/2" to surface.

1. Provide ties which, when removed, will leave holes not larger than 1" diameter in concrete surface.

2.02 REINFORCING MATERIALS

A. Reinforcing Bars: All reinforcing steel shall conform to ASTM A615, Grade 60, deformed (60 KSI yield stress) and be rolled from intermediate grade new steel billets.

B. Welded Wire Fabric: All reinforcement mesh shall be electric-welded wire fabric with an ultimate tensile strength of not less than 55,000 pounds per square inch. All reinforcement mesh shall conform to ASTM A-185.

C. Supports for Reinforcement: Provide bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications (brick is not acceptable other than for slabs on ground).

1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs. Precast concrete bricks are acceptable for slab on ground construction.

2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

3. Certified copies of mill reports shall accompany all deliveries of reinforcing steel, identified to indicate the minimum yield strength of the furnished bars.

4. Copies of the manufacturer's affidavit shall accompany all deliveries of welded wire fabric certifying its minimum tensile strength.

D. For LEED projects all steel reinforcement to contain minimum 90% combined post-consumer and post-industrial recycled content.

2.03 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I.

1. Use one brand of cement throughout the project, unless otherwise acceptable to the Architect.

B. For LEED projects Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

1. Provide no more than 25% within the mix for use on exposed slabs on grade, elevated slabs, sidewalks, ramps and stairs.

2. Provide no more than 40% within the mix for use on foundation walls, grade beams, piers, footings, etc.

C. Normal Weight Aggregates: ASTM C33, and as herein specified. Provide aggregates from a single source for exposed concrete.

1. For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling-causing deleterious substances.

2. Local aggregates not complying with ASTM C 33 but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to the Architect.

3. Coarse aggregates for all stone concrete and fine aggregate shall conform to ASTM Designation C33 - well graded from fine to coarse with the specified limits. The maximum size of the aggregate 3/4" in slabs, beams and columns and 1-1/2" in walls and footings and not larger than one-fifth (1/5) of the narrowest dimension between the sides of the forms of the member for which the concrete is to be used, not larger than three-fourths (3/4) of the minimum clear spacing between reinforcing bars.

4. Coarse aggregate for stone concrete shall consist of crushed stone or natural or crushed gravel, having clean, hard, strong, uncoated particles free from injurious amounts of soft, thin, elongated, or laminated pieces, alkali, organic, or other deleterious matter.

5. Fine aggregate for stone concrete - sand, stone screenings, or other inert material with similar characteristics having clean, strong, durable, uncoated grains, and free from lumps, salt, or flaky particles, clay, shale, alkali, organic matter, or other deleterious substance.

6. Aggregates shall be graded as follows:

Coarse Aggregate	*Percent Retained*
1" sieve	0
3/4" sieve	0 - 10
3/8" sieve	45 - 80
No. 4 sieve	90 – 100

Fine Aggregates	*By Weight Passing*
Passing 1/4" square opening	100%
Passing No. 4 sieve	95 - 100%
Passing No. 16 sieve	50 - 85%
Passing No. 50 sieve	15 - 25%
Passing No. 100 sieve	2 - 8%

D. Anti-shrinkage grout to be used for grouting in of bearing plates, anchors, and inserts shall be Master Builders *"Embecco"* premix or approved equal.

E. Admixtures shall be used only with the prior written approval of the Architect. All mixtures specified herein or proposed for use by the Contractor shall be of a manufacturer as approved by the Architect and used strictly in accordance with the manufacturer's directions.

1. A set-controlling, water-reducing admixture: *"Pozzolith"* manufactured by Master Builders or approved equal.

2. Air-entraining Admixture: ASTM C-260, certified by manufacturer to be compatible with other required admixtures.

   a. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

      1. *"Air-Mix"*; Euclid Chemical Company.
      2. *"Sika Aer"*; Sika Corporation.
      3. *"MB-VR* or *MB-AE"*; Master Builders.
      4. *"Darex AEA"* or *"Daravair"*; W.R. Grace.
      5. *"Edoco 2001* or *2002"*; Edoco Technical Products.
      6. *"Air-Tite"*; Gifford Hill/American Admixtures.

   b. Air-entraining admixtures shall be used for all concrete exposed to weather.

F. Water: Water used in mixing concrete shall be clean, potable (drinkable), and free from injurious amounts of oils, acids, alkalis, organic materials, or other deleterious materials. (complying with ASTM C94).

G. All concrete shall have vapor lock 20/20 additive (or equal to enable new flooring install as per schedule

2.04 RELATED MATERIALS

A. Reglets: Where resilient or elastomeric sheet flashing or bituminous membranes are terminated in reglets, provide reglets of not less than 26 gauge galvanized sheet steel. Fill reglet or cover face opening to prevent intrusion of concrete or debris.

   1. Polyethylene sheet not less than 8 mils thick.

B. Non-shrink Grout: CRD-C 621, factory pre-mixed grout.

   1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

      a. Non-metallic:

         1. *"Set Grout"*; Master Builders.
         2. *"Sonogrout"*; Sonneborn-Rexnord.
         3. *"Euco-NS"*; Euclid Chemical Company.
         4. *"Supreme"*; Gifford-Hill/American Admixtures.
         5. *"Crystex"*; L & M Construction Chemical Company.
         6. *"Sure-Grip Grout"*; Dayton Superior Corporation.
         7. *"Horngrout"*; A.C. Horn, Inc.
         8. *"Five Star Grout"*; U.S. Grout Corporation.

C. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per square yard, complying with AASHTO M 182, Class 2.
   1. For LEED projects Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
      a. Provide no more than 25% within the mix for use on exposed slabs on grade, elevated slabs, sidewalks, ramps and stairs.
      b. Provide no more than 40% within the mix for use on foundation walls, grade beams, piers, footings, etc.

D. Moisture-Retaining Cover: One of the following, complying with ASTM C 171:
   1. Waterproof paper.
   2. Polyethylene film.
   3. Polyethylene-coated burlap.

E. Liquid Membrane-Forming Curing Compound: Concrete slabs shall be cured by means of pigmented curing compound of a type not affecting adhesion of resilient flooring or other surface finish, of approved manufacture, conforming to ASTM C-309, and applied in strict accordance with manufacturer's directions. Liquid type membrane-forming curing compound complying with ASTM C 309, Type 1, Class A. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal.
   1. Available Products: Subject to compliance with requirements, products, which may be incorporated in the work include, but are not limited to, the following:
      a. *"Masterseal"*; Master Builders.
      b. *"A-H 3 Way Sealer"*; Anti-Hydro Waterproofing Company.
      c. *"Ecocure"*; Euclid Chemical Company.
      d. *"Clear Seal"*; A.C. Horn, Inc.
      e. *"Sealco 309"*; Gifford-Hill/American Admixtures.
      f. *"J-20 Acrylic Cure"*; Dayton Superior.
      g. *"Spartan-Cote"*; The Burke Company.
      h. *"Sealkure"*; Toch Div. - Carboline.
      i. *"Kure-N-Seal"*; Sonneborn-Rexnord.
      j. *"Polyclear"*; Upco Chemical/USM Corp.
      k. *"L & M Cure"*; L & M Construction Chemicals.
      l. *"Klearseal"*; Setcon Industries.
      m. *"LR-152"*; Protex Industries.
      n. *"Hardtop"*; Gifford-Hill.
   2. Liquid membrane curing compounds may only be used on slabs where there is no other finish flooring material to be installed.

F. Bonding Compound: Polyvinyl acetate or acrylic base.
   1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but

are not limited to, the following:

a. Polyvinyl Acetate (Interior Only):

1. *"Eucoweld"*; Euclid Chemical Company.
2. *"Weldcrete"*; Larsen Products Corporation.

b. Acrylic or Styrene Butadiene:

1. *"J-40 Adbond Bonding Agent"*; Dayton Superior Corp.
2. *"Everbond"*; L & M Construction Chemicals.
3. *"Hornweld"*; A.C. Horn, Inc.
4. *"Sonocrete"*; Sonneborn-Rexnord.
5. *"Acrylic Bondcrete"*; The Burke Company.
6. *"SBR Latex"*; Euclid Chemical Company.
7. *"Daraweld C"*; W.R. Grace.

G. Epoxy Adhesive: ASTM C 881, two component material suitable for use on dry or damp surfaces. Provide material "Type," "Grade," or "Class" to suit project requirements.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

a. *"Thiopoxy"*; W.R. Grace.
b. *"Epoxtite"*; A.C. Horn, Inc.
c. *"Edoco 2118 Epoxy Adhesive"*; Edoco Technical Products.
d. *"Sikadur Hi-Mod"*; Sika Chemical Corporation.
e. *"Euco Epoxy 452 or 620"*; Euclid Chemical Company.
f. *"Patch and Bond Epoxy"*; The Burke Company.
g. *"Concresive 1001"*; Adhesive Engineering Company.

H. Joint Fillers / Filler Strips: Joints for slabs on ground shall be formed with preformed, non-exuding bituminous fiber expansion filler, which shall extend full length and depth of slabs. Vertical expansion joints shall be constructed complete with water dams or waterstops and joint filler.

I. Vapor Barriers: Under typical interior slabs where finished flooring does not involve wood, provide non-woven, polyester, reinforced, polyethylene coated sheet of 15 mil thickness.

1. Vapor barrier membrane must have the following properties:

a. Permeance as tested after mandatory conditioning (ASTM E 1745 paragraphs 7.1.2-5): less than 0.01 perms (gran/ft^2/hr/in-Hg).

b. Other performance criteria:

1. Strength: Class A (ASTM E 1745).

2. Minimum thickness of plastic retarder material: 15 mils.

c. Basis of Design: Stego Wrap 15-mil Vapor barrier by Stego Industries, LLC.

d. Or Architect approved equal.

J. Vapor barrier under interior slabs where finished flooring involves wood assemblies such as gymnasium and stages provide bituminous vaporproofing/waterproofing membrane.

1. Vapor barrier must have seven-ply, weather-coated, permanently bonded, semi-flexible bituminous core board composed of a 3-ply plasmatic matrix sealed between liners of asphalt-impregnated felt and a glass mat liner. Vapor barrier shall consist of an asphalt weather coat and covered with a polyethylene anti-stick sheet. Vapor barrier shall meet or exceed all requirements of ASTM E 1993-98 and shall have the following characteristics:

a. Minimum permeance ASTM F1429, calibrated to ASTM E96, Water Method: 0.0011 Perms.

b. Tensile Strength ASTM E154, Section 9: 156 LBS. force.

c. Puncture Resistance ASTM E154: 149 LBS. force/inch.

d. Pre-molded Membrane® Vapor Seal with Plasmatic Core by W.R. Meadows, W.R. Meadows, Inc., PO Box 338, Hampshire, Illinois 60140-0338. (800) 348-5976. (847) 683-4500. Fax (847) 683-4544. Website: www.wremeadows.com.

K. Water Stops: Provide all waterstops similar to or equal to those as produced by *Greenstreak, Inc.*, as required by the drawings, either embedded in concrete, or across and/or along the joint, to form a watertight diaphragm that prevents the passage of fluid through the joint.

L. All other materials as hereinafter specified. All set-in-place concrete elements (i.e. – pre-fabricated water stops, cast aluminum nosings, exterior stair components, etc.) shall be installed in conformance with their associated specification sections, and/or manufacturer's installation instructions if no specification is provided and in complete coordination with the work of this Section.

2.05 PROPORTIONING AND DESIGN OF MIXES

A. Design mix of all concrete shall provide the following properties, as indicated on the drawings and schedules:

1. 4,000 psi 28-day compressive strength; W/C ratio, 0.58 maximum (non-air-entrained), 0.46 maximum (air-entrained).

2. 4,500 psi 28-day compressive strength; W/C ratio, 0.67 maximum (non-air-entrained), 0.54 maximum (air-entrained).

3. Do not air entrain concrete for trowel finished interior

floors and suspended slabs, including polished concrete floors. Do not allow entrapped air content to exceed 3 percent.

B. Stone concrete shall weigh approximately 144 pounds per cubic foot. Exterior concrete, exposed to weather, shall have a water cement ratio not to exceed 6 1/2 gallons per sack of cement and an air entraining agent approved by the Architect to be added to obtain concrete with an air content not less than 4% nor more than 6% conforming to ASTM C-175, latest edition.

C. Prepare design mixes for each type and strength of concrete laboratory trial batch methods as specified in ACI 301. Use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.

D. Submit written reports to Architect and Structural Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed and accepted by the Architect.

E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to the Owner and as accepted by the Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by the Architect before using in work.

F. Admixtures: ONLY TO BE USED WITH PRIOR WRITTEN APPROVAL OF THE ARCHITECT!

1. Use water-reducing admixture or high range water-reducing admixture (super plasticizer) in concrete as required for placement and workability.

2. Use non-chloride accelerating admixture in concrete slabs placed at ambient temperatures below 50°F (10°C).

3. Use high-range water-reducing admixture in pumped concrete, concrete for industrial slabs, architectural concrete, parking structure slabs, concrete required to be watertight, and concrete with water/cement ratios below 0.50.

4. Use air-entraining admixture in exterior exposed concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1-1/2 percent within the following limits:

a. Concrete structures and slabs exposed to freezing and thawing, de-icer chemicals, or subjected to hydraulic pressure.

b. 4.5 percent (moderate exposure).

5.5 percent (severe exposure) 1-1/2" maximum aggregate.

c. 4.5 percent (moderate exposure)
6.0 percent (severe exposure) 1" maximum aggregate.

5. Use admixtures for water-reducing and set-control in strict compliance with manufacturer's directions.

G. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:

1. Ramps, slabs, and sloping surfaces: Not more than 3".

2. Reinforced foundation systems: Not less than 1" and not more than 3".

3. Concrete containing HRWR admixture (super-plasticizer): Not more than 8" after addition of HRWR to site-verified 2"-3" slump concrete.

4. Other concrete: Not less than 1" and not more than 4".

2.06 MIXING

A. All concrete shall be machine mixed or transit mixed.

B. Hand mixing will not be permitted unless approved by the Architect. Mixing shall conform to ASTM C-94 and ACI-304. On-site mixing will not be permitted unless approved by the Architect/Engineer.

C. Machine mixing shall be done in an approved batch mixer. Sand and gravel shall be measured by weighing. Mixing shall be continued for at least one minute after all materials are in the mixing drum at a speed of not less than twelve nor more than eighteen revolutions per minute. The volume of the mixing materials per batch shall not exceed manufacturer's rated capacity of mixer. A water gauge shall be provided to deliver the exact predetermined amount of water for each batch. Mixing shall be continued for at least 1 minute for 1 cubic yard of concrete plus 1/4 minute for each additional cubic yard of concrete after all materials.

D. Transit mix concrete shall conform to the specification and tests herein described and to ASTM C-94 and ACI-304, most current edition(s); and further provided that the central plant producing the concrete and equipment transporting it are, in the opinion of the Architect, suitable for production and transportation of controlled concrete. The maximum elapsed time between the time of the introduction of water and placing shall be one hour.

E. Exterior concrete exposed to weather: Water cement ratio shall not exceed 6 1/2 gallons per sack of cement and an air-entraining agent approved by the Architect shall be added to obtain concrete with an air content not less than 4% nor more than 6% conforming to ASTM C-175, latest edition.

F. Ready-mix Concrete: Comply with the requirements of ASTM C 94, and as specified herein.

1. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.

PART 3 - EXECUTION

3.01 GENERAL

A. The Contractor shall notify the Architect, Construction Manager (when applicable) and the approved testing laboratory at least 24 hours in advance of the time he intends to use ready mixed concrete so that an inspector may be assigned to the plant to supervise the mix, and be available at the site to witness pour and sampling.

B. With each delivery of concrete, furnish to the superintendent at the building site a delivery slip (certified by laboratory representative) showing mix, quantity of cement, fine and coarse aggregates, and water, and time of departure from the plant.

C. Under no circumstances shall transit-mixed concrete be delivered from the plant, unless mix design has been approved by the Architect and inspector of testing laboratory. The approved plant and its operating equipment shall be under the supervision of the testing laboratory appointed by and directly responsible to the Architect.

D. Coordinate the installation of joint materials and vapor retarders with placement of forms and reinforcing steel.

3.02 FORMS

A. Design, erect, support, brace, and maintain form work to support vertical and lateral, static, and dynamic loads that might be applied until such loads can be supported by concrete structure. Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances complying with ACI 347.

B. Design form work to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent materials.

C. Construct forms to sizes, shapes, lines, and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages, inserts, and other features required in the work. Use selected materials to obtain required finishes. Solidly butt joints and provide back up at joints to prevent leakage of cement paste.

D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces.

1. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.

E. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.

F. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

G. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.

H. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, etc., or other debris just before concrete is placed. Retightening forms and bracing after concrete placement as required to eliminate mortar leaks and maintain proper alignment.

3.03 PREPARATION OF FORM SURFACES

A. Clean re-used forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.

B. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.

C. Thin form-coating compounds only with thinning agent of type, amount, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

D. Coat steel forms with a non-staining, rust preventative form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

3.04 VAPOR RETARDER INSTALLATION

A. Following leveling and tamping of granular base for slabs on grade, place vapor retarder sheeting with longest dimension parallel with direction of pour. Lap joints and seal with appropriate tape.

B. All concrete slabs on grade or fill shall receive membrane placed on porous fill prior to placing reinforcing. Membrane shall be placed with 6" laps at ends and sides, and without tears or ruptures at the time concrete is placed thereon.

C. Both standard vapor barrier and pre-molded membrane when applicable shall be installed in accordance with the manufacturers requirements.

3.05 PLACING OF REINFORCEMENT

A. Comply with *Concrete Reinforcing Steel Institute*'s recommended practice for *"Placing Reinforcing Bars",* for details and methods of reinforcement placement and supports, and as specified herein.

B. All reinforcement shall be rigidly wired in place with adequate spacers and zinc coated tie chairs. Bar supports shall be not more than 4'-0" o.c. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete. Reinforcement for concrete slabs on ground or fill shall be supported on precast concrete bricks. On formwork, galvanized coated chairs or spacers shall be used.

C. Reinforcement shall be placed so that where temperature shrinkage of bars occur, they shall be no closer to top of slab than 3/4". Coordinate with work under Electrical Contract so that conduits may be replaced to obtain this result.

D. Accurately position, support, and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers as required.

E. All reinforcement shall be bent cold. The minimum radius of bend shall be 4 diameters for bars 5/8" round or less and 6 diameters for larger bars.

F. Place reinforcement to obtain at least minimum coverage for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

G. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace overlaps with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

H. Do not cut or puncture vapor barrier. Repair damage and reseal vapor barrier in accordance with manufacturer’s requirements before placing concrete.

I. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coating with epoxy repair coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.

J. Zinc-Coated Reinforcement: Repair, cut and damaged zinc coatings with zinc repair material according to ASTM A 780. Use galvanized steel wire ties to fasten zinc-coated steel reinforcement.

3.06 EXPANSION JOINTS

A. Joints for slabs on ground shall be formed with preformed, non-exuding bituminous fiber expansion filler, which shall extend full length and depth of slabs.

B. Vertical expansion joints shall be constructed complete with water dams or waterstops and joint filler.

C. Joint material in exterior concrete, sidewalks, plazas, stairs, ramps, curbs, etc. shall be held 1/4" from finished surface and finished with approved traffic grade sealant.

3.07 OTHER JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.

3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints to girders a minimum distance of twice the beam width from a beam-girder intersection.

4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

5. Space vertical joints in walls as indicated per typical detail. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.

6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construction contraction joints for a depth as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.

2. Sawed Joints: Form contraction joints with power saws

equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2 mm-) wide joints 1" deep into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.

2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealant," are indicated.

3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip section together.

E. Doweled Joints: Install dowel bards and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.08 INSTALLATION OF EMBEDDED ITEMS

A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.

1. Install reglets to receive top edge of foundation sheet waterproofing, and to receive thru-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, relieving angles, and other conditions.

2. Install anchor bolts, accurately located, to elevations required.

B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed straps for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.

3.09 CONCRETE PLACEMENT

A. The Contractor shall notify the Owner, the Architect, the Construction Manager (when applicable) and the testing laboratory at least 48 hours in advance of the time he intends to place concrete in order to afford them the opportunity to observe placing operations. The Contractor shall obtain the Architect's and testing

laboratory's permission prior to placing concrete.

B. All forms must be absolutely clean and free from shavings and dirt prior to starting concrete operations.

C. Under no circumstances shall concrete be deposited in or under water, nor on muddy or frozen ground.

D. Pre-placement Inspection: Before placing concrete, the Contractor shall inspect and complete all formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used. Protect adjacent finish materials against spatter during concrete placement.

1. Apply temporary protective covering to lower 2' of finished walls adjacent to poured floor slabs and similar conditions, and guard against spattering during placement under any and all conditions of placement.

E. General: Comply with ACI 304 *"Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete"* and as herein specified.

1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.

2. Before depositing new concrete against concrete which has set, the forms shall be re-tightened and the surface of the concrete placed earlier shall be thoroughly roughened, cleaned of all foreign matter and laitance, shall be slushed with water, slushed with a coat of neat cement grout, and the new concrete shall be placed before the grout has attained its initial set, or the work shall be performed in such other approved manner as will insure a thorough bonding to the work.

F. All concrete must be placed as rapidly as possible after mixing and thoroughly spaded and rammed in place. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping. All possible care is to be exercised to prevent honeycombing. Concrete shall be placed in layers not over 12" thick and shall not be dumped from height over three feet. Concrete that must be placed more than 3 feet below placement level shall be chuted at a slope of not more than 1 in 2 or deposited through elephant trunks.

G. Concrete shall be placed in one operation up to temporary bulkheads, which shall be located, in general, at points of minimum shear.

H. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 12" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

1. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.

2. All structural concrete shall be placed with the aid of mechanical vibrators. The vibrators shall be of a type and design approved by the Architect and shall be capable of transmitting to the concrete not less than 3,000 impulses per minute. The vibration shall be sufficiently intense to visibly affect the concrete over a radius of at least 2'-0" around the point of application but shall not be applied long enough to segregate the ingredients. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. Enough vibration shall be used to cause all the concrete to flow or settle readily into place. The vibration shall be of internal type, applied directly to the concrete and not through the forms, except in sections too thin to permit the insertion of the internal type, in which case form vibration may be employed at the discretion of the Architect. Do not use vibrators to transport concrete inside forms.

I. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.

1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.

2. Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

3. Maintain reinforcing in proper position during concrete placement operations.

4. Slope surfaces uniformly to drains where required.

5. For exterior placement such as sidewalks, plazas, driveway aprons, curbing and equipment pads where no vapor barrier is required, the subgrade shall be moist before placing concrete. Dry or dusty subgrades shall be moistened to a minimum depth of one inch (1”) prior to placing concrete.

J. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein

specified.

1. When air temperature has fallen to or is expected to fall below 40°F (4°C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50°F (10°C), and not more than 80°F (27°C) at point of placement.

    a. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

    b. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.

    c. Protection of Footings Against Freezing: Cover completed work at footing level with sufficient temporary or permanent cover as required to protect footings and adjacent subgrade against possibility of freezing; maintain cover for time period as necessary.

K. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified. Concrete placed in warm weather shall be kept well sprinkled with water for at least one week after placing, unless other approved curing methods are used. No concrete shall be placed when the atmospheric temperature is above 90°F.

1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90°F (32°C). Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.

2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.

    a. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.

3. Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions, only upon approval of the Architect.

3.10 FINISH OF FORMED SURFACES

A. Rough Form Finish: For formed concrete surfaces not exposed to view in the finish work or by other construction, unless otherwise shown or indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4"

in height rubbed down or chipped off.

B. Smooth Form Finish: For formed concrete surfaces exposed to view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.

C. Smooth Rubbed Finish: Provide smooth rubbed finish to scheduled concrete surfaces, which have received smooth form finish treatment, immediately following form removal and not later than one day after form removal.

1. Moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.

D. Grout Cleaned Finish: Provide grout cleaned finish to scheduled concrete surfaces which have received smooth form finish treatment.

1. Combine one part Portland cement to 1-1/2 parts fine sand by volume, and mix with water to consistency of thick paint. Proprietary additives may be used at Contractor's option. Blend standard Portland cement and white Portland cement, amounts determined by trial patches, so that final color of dry grout will match adjacent surfaces.

2. Thoroughly wet concrete surfaces and apply grout to coat surfaces and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.

E. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off, smooth, and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.11 MONOLITHIC SLAB FINISHES

A. Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, Portland cement terrazzo, and other bonded applied cementitious finish flooring material, and as otherwise indicated.

1. After placing slabs, plane surface to tolerances for floor flatness (F_F) of 15 and floor levelness (F_L) of 13. Slope surfaces uniformly to drains where required. After leveling, while sill plastic, roughen surface before final set, with stiff brushes, brooms, or rakes to provide a profile amplitude of ¼ inch (6 mm) in one direction.

B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo, and as otherwise indicated.

1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Check and level surface plant to tolerances of F_F 18 - F_L 15. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

C. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating system and below wood flooring systems.

1. After floating, begin first trowel finish operation using a hand or power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances according to ASTM E 1155 (ASTM E1155M)for a randomly trafficked floor surface. Grind smooth surface defects which would telegraph through applied floor covering system.

a. Specified overall values of flatness: (F(F)35, and levelness, F(L)25, with minimum local values of flatness F(F)24 and levelness F(L)17 for slabs on grade.

2. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.-(3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch (3.2 mm).

D. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with either thin-set or thick-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming. Comply with flatness and levelness tolerances for trowel finished floor surfaces.

E. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps, sidewalks, plazas, aprons, curbs and ramps, and elsewhere indicated.

1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with

Architect before application.

F. Slip-Resistive Finish: Before final floating, apply slip-resistive aggregate finish where indicated and to concrete stair treads, platforms and ramps. Apply according to manufacturer's written instructions and as follows:

1. Uniformly spread 25/100 sq. ft. (12 kg/10 sq. m) of dampened slip-resistive aggregate over surface in one or two applications. Tamp aggregate flush with surface, but do not force below surface.

2. After broadcasting and tamping, apply float finish.

3. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive aggregate.

G. Dry-Shake Floor Hardener Finish: After initial floating, apply dry-shake floor hardener to surfaces according to manufacturer's written instructions as follows:

1. Uniformly apply dry-shake floor hardener at a rate of 100 lb/100 sq. ft. (49 kg/10 sq. m) unless greater amount is recommended by manufacturer.

2. Uniformly distribute approximately two-thirds of dry-shake floor hardener over surface by hand or with mechanical spreader, and embed by power floating. Follow power floating with a second dry-shake floor hardener application, uniformly distributing remainder of material, and embed by power floating.

3. After final floating, apply a trowel finish. Cure concrete with curing compound recommended by dry-shake floor hardener manufacturer and apply immediately after final finishing.

3.12 CONCRETE CURING AND PROTECTION

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting; keep continuously moist for not less than 7 days.

2. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

3. The Contractor shall continuously protect cement finish floors from damage for the duration of the work by such means as approved by the Architect and shall leave same in perfect condition to receive other floor finishes or where exposed in the finished work, they shall be in perfect condition at completion and acceptance of the building.

B. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified as appropriate to finished condition of concrete surface.

1. Provide moisture curing by following methods:

a. Keep concrete surface continuously wet by covering with water.

b. Continuous water-fog spray.

c. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and continuously keeping wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.

2. Provide moisture-cover curing as follows:

a. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Provide curing and sealing compound to exposed interior slabs (no other finish materials) and to exterior slabs, walks, and curbs as follows:

a. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

b. Do not use membrane curing and sealing compounds compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring (such as ceramic or quarry tile, vinyl tile, linoleum, glue-down carpet, etc.), painting, and other coatings and finish materials unless otherwise acceptable to the Architect.

C. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs, and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

D. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs,

floor topping, and other flat surfaces by application of appropriate curing method.

1. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture retaining cover, unless otherwise directed.

3.13 REMOVAL OF FORMS

A. Form work not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50°F (10°C) for 24 hours after placing concrete, provided concrete is sufficiently hard not to be damaged by form removal operations and provided curing and protection operations are maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete-in-place unit concrete has achieved at least 70 percent of its 28-day design compressive strength.

2. Remove forms only if shores have been arranged to permit remove of forms without loosening or distributing shores.

B. Form facing material may be removed 4 days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

3.14 RE-USE OF FORMS

A. Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated, or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new form work.

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms close to joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to the Architect.

3.15 SHORES AND RESHORES

A. Comply with ACI 318 (ACI 318M) and ACI 301 for design, installation, and removal of shoring and re-shoring.

1. Do not remove shoring or re-shoring until measurement of slab tolerances is complete.

B. In multi-story construction, extend shoring or re-shoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.

C. Plan sequence of removal of shores and re-shores to avoid damage to

concrete. Locate and provide adequate re-shoring support construction without excessive stress or deflection.

3.16 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer finishing machines and equipment.

1. Grout base plates and foundations as indicated, using specified non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.

D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in safety inserts and accessories as shown on drawings. Screed, tamp, and finish concrete surfaces as scheduled.

E. Pits, Trenches, etc.: Build all pits, pit cleanouts, trap pits, trenches, curbs, and pads as required by the drawings and by job conditions.

F. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous watertight diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer’s written instructions.

G. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer’s written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.17 CONCRETE SURFACE REPAIRS

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect.

1. Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts down to solid concrete but in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Before

placing cement mortar, thoroughly clean, dampen with water, and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

a. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

B. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface, and stains or other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar or precast cement cone plugs secured in place with bonding agent.

1. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.

C. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using a template having required slope.

1. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets, and other objectionable conditions.

2. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.

3. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Patching compounds may be used when acceptable to Architect.

4. Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact,

and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

5. Repair isolated random cracks and single holes not over 1" diameter by dry-pack method. Groove top of cracks and cutout holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part Portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

6. Perform structural repairs with prior approval of Architect or Structural Engineer for method and procedure, using specified epoxy adhesive and mortar.

7. Repair methods not specified above may be used, subject to acceptance of Architect.

3.18 CUTTING, PATCHING, AND REMOVAL

A. The Contractor shall be responsible for all cutting and patching of his work as required to accommodate work of this section and of other sections and contracts.

B. Materials which have become damaged or have been condemned shall be removed from the site.

END OF SECTION

DIVISION 3 - CONCRETE

SECTION 03650 – SELF-LEVELING CEMENTITIOUS UNDERLAYMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this section.

B. Related Sections include the following:

1. Section 01618 – Removal of Asbestos Contaminated Substrate Material
2. Section 03300 – Cast-in-Place Concrete
3. Section 09650 – Resilient Flooring

1.02 SCOPE

A. The work under this section of the specifications shall consist of furnishing all labor, materials, equipment, and appliances necessary or required to furnish and install all work of this section as shown on the drawings and/or specified herein, including, but not limited to, the following:

1. Provide a self-leveling cementitious underlayment in accordance with the Contract Documents.

2. This system consists of the use of a primer and a mix of special cements and binders which, when mixed with water, becomes a highly liquid cement compound that seeks its own level and produces a smooth and flat surface. Finished surface shall be true to plane in accordance with ACI 117, Standard Specifications for Tolerances for Concrete Construction & Materials, or as directed by the floor finish manufacturer.

B. For this project, it is the expressed intent that all self-leveling products are to be provided in accordance with the Specifications by the General Contractor at all necessary and appropriate thicknesses at all locations requiring self-leveling product application due to new or existing slabs/subfloors not meeting required finish flooring product tolerances or infill of recessed slabs/subfloors. Refer to the specifications and manufacturers requirements for additional tolerance requirements specific to each type of finish flooring.

1.03 MANUFACTURER AND QUALITY ASSURANCE

A. Self-leveling underlayment concrete shall be "Ardex K-15" as

manufactured by Ardex, Inc., 400 Ardex Park Dr, Aliquippa PA 15001 (Allison Birkmeyer 724-777-2799).

1. Installation of ARDEX K 15 must be by a factory-trained applicator, such as an ARDEX LevelMaster Elite Installer, using mixing equipment and tools approved by the manufacturer. Please contact ARDEX at (888) 512-7339 for recommended Installers.

2. Underlayment shall be able to be installed from 1/8" over the highest point in the space and up to 1 1/2" in one pour and up to 5" with the addition of aggregate. It may also be feathered to match existing elevations.

3. Underlayment must be product is cement-based having a primary hydraulic cement inorganic binder, to include Portland cement per ASTM C150: Standard Specification for Portland Cement and other specialty hydraulic cements. Gypsum based materials are not allowed.

4. Underlayment shall be walkable after 2 hours and allow floor covering to be installed after 16 hours at 70°F.

5. Underlayment compressive strength shall be 4100 psi after 28 days per ASTM C109/mod (air cure only)

6. After proper substrate preparation, underlayment shall be suitable for use over the following substrates.

   a. New construction: Un-level concrete, rough concrete, rained-on concrete, frozen concrete, unfinished concrete, rough-screeded concrete, wooden or metal subfloors.
   b. Rehabilitation projects: Existing concrete, wood, metal, terrazzo, quarry tile, ceramic tile, and over cutback adhesive residue.

1.04 SUBMISSIONS

A. General: Comply with provisions of Section 01300.

B. Product Data: Manufacturer of the underlayment shall provide individual product specification sheets and technical data to include installation instructions and limitations of each product used.

   1. Complete materials list of all items proposed to be furnished and installed under this Section.

   2. Manufacturer's specifications and other data required demonstrating compliance with specified requirements.

   4. Manufacturer's certification that the product specified is suitable for the intended use when installed according to the parameters described in the manufacturer's printed literature and installation instructions.

5. Installer Qualifications: Manufacturer's written approval that installer is trained and qualified to perform work of this type.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in their original, unopened packages and protect from freezing, direct sun exposure and exposure to moisture. Recommended storage temperature is below 80°F.

1.06 SITE CONDITIONS

A. Ardex underlayments are cementitious materials. Observe the basic rules of concrete work. Do not install below 50°F surface temperature. Install quickly if floor is warm and follow hot weather precautions available from the manufacturer's Technical Service Department. Never mix with cement or additives other than manufacturer-approved products.

PART 2 – PRODUCTS

2.01 MATERIALS AND COMPONENTS

A. Materials:

1. The Portland cement-based self-leveling, cementitious underlayment or patching material shall be:

   a. Ardex K-15 self-leveling underlayment concrete (for all standard self-leveling).

   b. Technical Data: All data is based on a mixing ratio of 3.5 p.b.v. of powder to 1 p.b.v. of water at 70°F.

      i. Flowing Time: Approximately 10 minutes
      ii. Initial Set, ASTM C191: Approximately 30 minutes
      iii. Final Set, ASTM C191: Approximately 90 minutes
      iv. Compressive Strength, ASTM C-109/mod:4100 psi(28 days)
      v. Flammability, ASTM E84-81a:

Flame Spread	-0-
Fuel Contribution	-0-
Smoke Development	-0-

      vi. Coverage: Approx. 60 sq.ft. at 1/8", 30 sq.ft. at 1/4".

2. Primer for standard absorbent concrete shall be Ardex P-51 Primer.

3. Primer for non-porous subfloors such as burnished concrete, terrazzo, quarry and ceramic tile shall be ARDEX P 82 Ultra

Prime.

4. Primer for non-porous subfloors, cut-back and non-water soluble adhesive residues, and metal and wooden subfloors shall be Ardex P-82 Ultra Prime.

5. The additive to be mixed with Ardex K-15 when used over cut-back adhesive, metal, or wooden subfloors shall be Ardex E-25 Resilient Emulsion.

6. Aggregate shall be well-graded, washed pea gravel (1/8" to 1/4" or larger) for use when underlayment is installed over 1 1/2" thick. (Max. installation is 5")

7. Water shall be clean, potable, and sufficiently cool (not warmer than 70°F).

8. Portland cement-based trowel-grade underlayment (for patch & skim coating) shall be:

   a) Ardex SD-P Instant Patch Self-Drying, Fast-Setting Concrete Underlayment Patch (for repairing substrates and ramping).

   b) Ardex SD-F Feather Finish Self-Drying, Cement-Based Finishing

B. Moisture Vapor Suppression (For use where the level of moisture emissions from the concrete slab exceed the maximum permitted by the manufacturer of the finished flooring):

   1. Moisture Control System shall be Ardex MC Rapid one-coat moisture control system for use over new or existing concrete. Use of a moisture control system shall be field determined based upon relative humidity measurements within the concrete in accordance with ASTM F2170 or surface of the concrete in accordance with ASTM F2420. Labor and material costs for the installation of the moisture control system are excluded from the contractors Base Bid and shall be applied via agreed upon Change Order or Allowance Authorization in accordance with the General Conditions of Contract.

2.02 MIX DESIGNS

A. Ardex K-15 Self-Leveling Underlayment Concrete (standard underlayment):

1. Standard mixing ratio: Ardex K-15 shall be mixed in 2-bag batches at one time. Mix each bag of Ardex K-15 (55 lb.) with 7 quarts of water. Product shall be mixed in T-10 mixing drum using a T-1 mixing paddle and a 1/2" heavy-duty drill (min. 650 rpm). Mix thoroughly for approximately 2-3 minutes to obtain a lump-free mixture. Follow written instructions per the Ardex K-15 bag label.

2. Resilient mix for applications over cutback and non-water soluble adhesive residues, wood, and metal: Use 6 qt. of water and 2 qt. of Ardex E-25 Resilient Emulsion for each bag of Ardex K-15.

3. Aggregate mix: For areas to be installed over 1 1/2" thick and up to 5”, aggregate may be added to reduce material costs. Mix Ardex K-15 with water first, then add from 1/3 up to 1 part by volume of aggregate (1/8" to 1/4" or larger). Do not use sand.
4. For pump installations, Ardex K-15 shall be mixed using the Ardex Levelcraft Automatic Mixing Pump. Start the pump at 210 gallons of water per hour, and then adjust to the minimum water reading that still allows self-leveling properties. DO NOT OVERWATER. Check the consistency of the product on the floor to ensure a uniform distribution of the sand aggregate at both the top surface and bottom of the pour. If settling is occurring, reduce the water amount and recheck. If settling is occurring, reduce the water amount and recheck. Conditions during the installation, such as variations in water, powder, substrate, and ambient temperature, require that the water setting be monitored and adjusted carefully to avoid overwatering.

B. Ardex SD-P Instant Patch Self-Drying, Fast-Setting Concrete Underlayment Patch (for repairing substrates and ramping):

1. Mix 1 bag of Ardex SD-P (40 lbs.) with 4 quarts of water. Product can be mixed in a clean 5-gallon pail using a mixing paddle and a ½” heavy-duty drill (min. 650 rpm). Mix thoroughly for approximately 2-3 minutes to obtain a lump-free mixture. Follow written installation instructions per Ardex SD-P bag label.

C. Ardex SD-F Feather Finish Self-Drying, Cement-Based Finishing Underlayment (for flash patching & skim coating):

1. The recommended mixing ratio is 2 parts powder to 1 part water by volume. Mix the Ardex SD-F powder with water to the desired trowelable consistency using a margin trowel or an approved paddle and drill.

PART 3 - EXECUTION

3.01 GENERAL

A. In addition to the general procedures described herein, refer to manufacturer's current published product literature for complete installation details for the underlayment system being installed.

3.02 SUBSTRATE PREPARATION

A. All subfloors, regardless of material, must be solid, thoroughly cleaned, and properly primed. Gypsum, latex patches, asphalt, coal

tar and lightweight insulating concrete are not suitable substrates to receive cementitious underlayment.

1. All concrete subfloors must be of adequate strength, clean and free of all oil, grease, dirt, curing compounds, and any substance which might act as a bond breaker before priming. Mechanically clean if necessary using shot blasting or other methods. **Acid etching and the use of sweeping compounds and solvents are not acceptable.**

2. Wooden subfloors must be clean and free of all foreign matter. Sand to bare wood, then vacuum to remove all dust. Re-nail any loose boards exhibiting movement.

   a. Note: Ardex SDF Feather Finish shall be used to fill in the seams in strip wood so the Ardex K15 Self Leveling Underlayment does not flow in to the seams.

3. Metal decking subfloors must be clean and free of all rust and foreign matter. Where required, a corrosive resistant coating should then be applied, and be allowed to dry before priming.

4. Cut-back and other non-water soluble adhesive residues must be wet-scraped to a thin, solid, well bonded layer.

5. Non-porous surfaces such as ceramic tile, quarry tile, terrazzo etc., should be clean and free of wax and sealers. If necessary, have the surface professionally cleaned.

6. All cracks in the subfloor shall be repaired to minimize telegraphing through the underlayment.

7. Prior to installation, substrates shall be inspected and corrected for moisture or any other conditions that could affect the performance of the underlayment or the finished floor covering. If moisture vapor emissions exceed the flooring manufacturer's recommendations, installation of an ARDEX MC™ Moisture Control System (ARDEX MC RAPID, MC PLUS or MC Ultra) will be required. For complete installation instructions, please refer to the appropriate ARDEX MC Moisture Control Technical Brochure.

B. Ardex MC Moisture Control System shall be installed in accordance with manufacturers written technical instructions.

3.03 JOINT PREPARATION

A. Moving Joints – honor all expansion and isolation joints up through the underlayment or Ardex MC Moisture Control System.

B. Saw Cuts and Control Joints – fill all non-moving joints with Ardex SD-F or Ardex SD-P.

C. When using an Ardex MC Moisture Control System, installation shall be in accordance with manufacturers written technical instructions for the treatment of saw cuts, control joints and dormant cracks.

3.04 PRIMING

A. Primer for standard absorbent concrete subfloors:

1. Prime with Ardex P-51 Primer. Mix Ardex P-51 1:1 with water and apply evenly with a soft pushbroom. Do not leave any bare spots. Remove all puddles and excess primer. Allow to dry to a clear, thin film (minimum 3 hours, maximum 24 hours). Underlayment shall not be applied until primer is dry.

2. Primer coverage is approximately 400 to 600 square feet per gallon.

B. Primer for extremely absorbent concrete subfloors:

1. Make an initial application of Ardex P-51 mixed with 3 parts water using a soft pushbroom. Do not leave any bare spots. Remove all puddles and excess primer. Allow to dry thoroughly before proceeding with a standard application of primer as described in Section 3.04 A. Item 1.

C. Primer for non-porous subfloors, wooden or metal subfloors, or cut-back adhesive residue or other non-water soluble adhesive residues over concrete:

1. Prime with Ardex P-82. Mix Part A (red) with Part B (white) and apply with a short-nap or sponge paint roller, leaving a thin coat of primer no heavier than a thin coat of paint. Do not leave any bare spots. Remove all puddles and excess primer. Allow to dry to a clear, slightly tack film (minimum 3 hours, maximum 24 hours). Underlayment shall not be installed until primer is dry.

2. Primer coverage is approximately 200 to 400 feet per gallon.

a. Minimum drying time for Ardex P-82 Ultra-Prime over cut-back adhesive residue is 18 hours.

3. Note: When using an Ardex MC Moisture Control System, the Ardex MC will act as the prime layer for Ardex K15.

3.05 APPLICATION OF ARDEX K-15:

A. Installation:

1. Pour or pump the liquid Ardex K 15 and spread in place with the Ardex T-4 Spreader. Use the ARDEX T-5 Smoother for featheredge and touch-up. Wear baseball shoes with non-metallic cleats to avoid leaving marks in the liquid Ardex K 15. Underlayment can be walked on in 2-3 hours at 70° F.

2. Wood subfloors require the use of the mesh-reinforced ARDEX K-15 + E-25 Underlayment System. After priming, install 3.4 galvanized diamond metal lath by stapling to the wooden subfloor approximately every 6 inches on center.

2. Steel subfloors require that the substrate first be primed with an anti-corrosive paint. After thorough drying of the paint, prime this surface with ARDEX P-82 Ultra Prime.

3.06 APPLICATION OF ARDEX SD-P:

A. Installation:

1. Non-porous subfloors require that the substrate first be primed with Ardex P-82 Ultra Prime and allowed to dry thoroughly prior to installing the Ardex SD-P.

a. Underlayment shall be installed using a wood or magnesium float. When underlayment begins to harden, finish with a steel trowel.

B. Drying Time:

1. When the underlayment can be worked on without adversely affecting the surface, proceed with the installation of floor covering. The surface of the Ardex SD-P does not have to be dry to receive ceramic tile, carpet, or vinyl floor coverings. It only needs to be hard enough to permit application of the adhesive with a notched trowel without marking the surface. Typical times range from 45 minutes to 1 hour depending upon ambient conditions.

2. All other floor coverings require a minimum of 16 hours of drying time at 70˚F and 50% relative humidity.

3.07 APPLICATION OF ARDEX SD-F:

A. Installation:

1. No priming is required on all standard substrates as listed in the technical brochure. Non-standard substrates such as epoxy floor covering shall first be primed with Ardex P-82 Ultra Prime and allowed to dry thoroughly prior to installing the Ardex SD-F.

2. Underlayment shall be installed using a steel trowel.

B. Drying Time:

1. When the underlayment can be worked on without adversely affecting the surface, proceed with the installation of floor covering. The surface of the Ardex SD-F does not have to be dry to receive ceramic tile, carpet, or vinyl floor coverings. It only needs to be hard enough to permit application of the

adhesive with a notched trowel without marking the surface. Typical times range from 15 minutes to 1 hour depending upon ambient conditions.

2. All other floor coverings require a minimum of 16 hours of drying time at 70°F and 50% relative humidity.

3.08 PREPARATION FOR FLOORING INSTALLATION

A. Underlayment can accept finish floor covering materials, to include Carpet, after 16 hours at 70°F and 50% relative humidity.

B. The surface of the underlayment shall be checked to ensure that it meets the flooring manufacturer's specifications for flatness before beginning the flooring installation. Areas out of tolerance shall be repaired using the appropriate Ardex underlayment (described herein based upon tolerance discrepancy) as required at the contractors expense.

C. Due to the wide range of adhesives that are used to install floor coverings, some adhesives may dry more quickly over underlayments than over other substrates. If this condition occurs, priming the surface of the underlayment with Ardex P-51 Primer diluted 1:3 with water will even out the drying of the adhesive. Allow the primer to dry 1-3 hours before proceeding with the adhesive installation.

3.09 FIELD QUALITY CONTROL

A. Field sampling of the Ardex underlayment is to be done by taking an entire unopened bag of the product being installed to an independent testing facility to perform compressive strength testing in accordance with ASTM C 109/modified: air-cure only. There are no in situ test procedures for the evaluation of compressive strength.

3.10 PROTECTION

A. Prior to the installation of the finish flooring, the surface of the underlayment should be protected from abuse by other trades by the use of plywood, Masonite or other suitable protection course.

END OF SECTION

DIVISION 4 - MASONRY

SECTION 04102 – NATRUAL STONE REPAIR & REPOINTING

PART 1 - GENERAL

1.01 SUMMARY OF WORK

A. Section includes:

1. Repair mortar and repointing mortar for patching and pointing of limestone, sandstone, brownstone, terra cotta, marble and/or granite.

B. Related Sections:

1. Section 04200 - Unit Masonry

2. Section 04500 – Masonry Restoration and Cleaning

3. Section 07900 - Caulking and Sealants

1.02 SUBMITTALS

A. Comply with the requirements of Section 01300 - Submittals and as modified below.

B. Product Data:

1. Submit manufacturer's product literature for patching and pointing products demonstrating compliance with specified requirements.

2. Submit material safety data sheets (MSDS) as appropriate.

C. Samples:

1. Samples shall be submitted for color matching.

2. Install patching and pointing mortar samples on masonry-preferably on the building. Do not make samples in cups or apply to plywood or other non-masonry surfaces.

D. Submit installers training certification documents.

1.03 QUALITY ASSURANCE/TEST REQUIREMENTS

A. For the purpose of the work of this section patching and pointing mortar are specified based on Jahn Restoration Mortar and Jahn Historic Pointing Mortar as distributed by Cathedral Stone Products Inc., 7266 Park Circle Drive, Hanover, MD 21076.

Requirements: If proposed equal is submitted, lab test data is required to establish equivalent performance levels.

B. Installer certification: All repairs shall be performed by a trained installer holding a Training Workshop Certificate from Cathedral Stone Products, Inc., or equal. Contractor shall maintain proof of this credential for each installer at the site at all times.

C. Samples: Prepare a sample of each type of repair listed below, using stone masonry removed from the building where designated by the Owner. Prepare, install, and finish each sample repair according to the specifications. All samples must be applied to stone masonry. Prepare samples in an area where they will be exposed to the same conditions as will be present on the building during curing. Allow samples to cure at least three days (or longer, if possible) before obtaining Owner's approval for color match. Mortar colors will continue to lighten as they cure and are exposed to the weather, so samples should be installed as far in advance as possible. A slightly darker color may give better long-term results. Samples should be viewed from a minimum distance of 12 feet.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Materials are to be delivered, stored, and handled to protect them from damage, extreme temperature, and moisture in accordance with Manufacturer's written instructions.

B. Deliver and store material in Manufacturer's original, unopened containers with the production date shown on the container or packaging.

C. Comply with the Manufacturer's written specifications and recommendations for mixing, application, and curing of mortars.

D. Store material in a dry area away from direct sunlight. Ambient storage conditions should be in the range of 40°F to 90°F with low to average humidity. Average shelf life is six months in original, unopened packaging.

1.05 PROJECT/SITE CONDITIONS

A. Cold Weather Requirements: Do not work in temperatures below 40°F, when the substrate is colder than 40°F, or when the temperature is expected to fall below 40°F for 48 hours after installation of repair mortars. Building an enclosure and heating areas to maintain this temperature may only be done with the written approval of the Architect.

B. Hot Weather Requirements: Protect repair mortar from direct sunlight and wind. Do not use or prepare mortar when ambient air temperature is above 90°F.

PART 2 - PRODUCTS

2.01 STONE MASONRY REPAIR/PATCHING MORTAR

A. Patching mortar shall be premixed cementitious repair materials formulated to match the color and texture of the existing stone masonry, and shall not contain acrylic, latex, or other synthetic polymer additives. Mortar shall be mixed with clean, potable water.

1. Jahn M70: Limestone, Sandstone, Brownstone.

2. Jahn M90: Cast Stone.

3. Jahn M100: Terracotta.

   a. Coat M100 repairs with Jahn Terracoat Glaze Repair.

4. Jahn M120: Marble.

5. Jahn M160: Granite, Bluestone.

B. Setting anchors in existing masonry: Jahn M80 Anchor Setting Mortar.

C. Mechanical anchors and dowels: Stainless steel threaded rod (ASTM F593) with a diameter as indicated on Contract Drawings, bent and cut to lengths required to achieve required embedment shown on the Contract Drawings.

D. Technical Data:

	M70	**M90**	**M100**	**M120**	**M160**
Compressive Strength	4300-4700 psi	2960-4610 psi	1500-2200 psi	1500-2200 psi	11600-13100 psi
Tensile bending strength	490-520 psi	580-566 psi	400 psi	400 psi	800-1000 psi
Tensile Strength	145-290 psi	510 psi	150 psi	150 psi	900-1100 psi
Modulus of elasticity	1730-1860 ksi	2440-2690 ksi	218-1540 ksi	218-1540 ksi	
Water absorption (%)	16%	26.6%	4.2 to 16.5%	4.2 to 16.5%	2.0-5.5%
Specific gravity	1.4	1.6-1.7	1.3	1.3	1.7

2.02 STONE MASONRY POINTING MORTAR

A. Pointing Mortar shall be Jahn M110 Historic Pointing Mortar.

B. Pointing mortar should be mixed with clean potable water. Excessive water will lighten the color of the cured mortar.

C. Packaging and Coverage: A 5 gallon plastic pail contains

approximately 44 lb. of material. This will cover 288 linear feet (1/4" joint at 1" depth).

D. Storage and Shelf Life: Store material in a dry area away from direct sunlight. Ambient storage conditions should be in the range of 40°F to 90°F with low to average humidity. Average shelf life is 6 months in original, unopened packaging.

E. Technical Data:

Jahn M110

LIQUID/PLASTIC PHASE	
Ratio water/dry material	1.2 to 1.5 fl. oz./lb.
Volume mixed mortar M110 in inches/3 per lb. of dry	12.0 fl. oz./lb.
HARDENED PHASE	
Compressive strength, wet	900 to 2200 psi
Compressive strength, dry	1000 to 2300 psi
Tensile bending strength, wet	700 to 800 psi
Tensile strength, dry	943 to 1000 psi
Tensile strength	87 to 145 psi
Linear thermal coefficient of expansion	6.3E-06 to 6.5E-06(in inches)°F
Hydraulic coefficient of expansion (%)	0.076 to 0.089
Modulus of elasticity	1730 to 1860 ksi
Open porosity (%)	34 to 36
Absorption (%)	1.4 (approx.)
Specific gravity	1.4

PART 3 - EXECUTION

3.01 GENERAL

A. Do not use any additives, such as bonding agents, accelerators, or retardants in the mortar.

B. It is recommended that safety goggles, gloves, and a dust mask equipped with P-2 filters (or equivalent) be worn for protection while mixing.

C. Do not apply Jahn Mortar to a frozen or exceedingly hot substrate. The applied mortar must be protected from extreme heat, freezing, excessive wind, direct sunlight, and rain. Ambient temperature range should be 40°F to 90°F with low to average humidity.

D. Do not add bonding agents to Jahn Mortar or use them as surface preparation materials.

E. Minimum thickness of mortar application is ¼".

3.02 STONE MASONRY REPAIR PREPARATION

A. Remove all loose mortar and masonry prior to installation of the repair mortar. "Sound" masonry with a hammer to verify its integrity. If necessary, cut away an additional ½" of the substrate to ensure the surface to be repaired is solid and stable. Remove any sealant residue.

B. Where cramp anchors, threaded rod anchors, or dowels have been cut and pieces remain embedded in the substrate: Anchors that are free of rust, solidly embedded, and do not project beyond the surface of the masonry unit may remain. All others shall be removed.

C. Cut the edges of the repair area to provide a minimum depth of ¼". The edges of the repair should be square cut. Do not allow any feathered edges in the repair area.

FOR DEEP OR OVERHANGING REPAIRS OR FOR USE IN HIGH RISE CONSTRUCTION, PROCEED WITH D-F, OTHERWISE SKIP TO G.

D. Install mechanical anchors in all repair areas if specified on the Contract Drawings or as otherwise directed by the Architect.

F. Install anchors as follows:

a. Drill holes to diameter specified on Contract Drawing.
b. Clean holes using compressed, oil-free air, and bristle brushes, until no dust cloud is produced when a brush, inserted the full depth of the hole is pulled out of the hole.
c. Embed anchors in back-up using Jahn M80, mixed according to Manufacturer's instructions.
d. Anchors should be covered with a minimum of ¾" repair material.

F. Clean all dust from surface and pores of the substrate, using clean water and a scrub brush.

G. For very dry or porous surfaces, pre-wet the substrate ahead of time to prevent the substrate from drawing moisture out of the repair too quickly. Re-wet the surface immediately before applying the repair material.

3.03 STONE MASONRY REPAIR MORTAR MIXING

A. It is recommended that a dust mask be worn during mixing. Do not mix more material than can be used within 30 minutes. Discard any mixed material that has been unused for 30 minutes or more.

B. Mixing ratios for limestone, sandstone, brownstone, cast stone, granite, marble, and terra cotta and are as follows:

6. Approximately 5 ½ parts dry material to 1 part water:
   M70-Limestone, Sandstone, Brownstone
   M90-Cast Stone
   M160-Granite, Bluestone

7. Approximately 5 parts dry material to 1 part water:
   M100-Terra Cotta
   M120-Marble

C. Add water to dry ingredients and mix well. Adjust amount of water according to the weather and the porosity of the substrate.

3.04 STONE MASONRY REPAIR MORTAR APPLICATION

A. Apply the mortar mix using a trowel in a series lifts with no waiting period or scratch coat necessary between layers, up to a total maximum thickness of 3". For repairs thicker than 3", apply mortar in two layers, allowing the first layer to cure before applying the second layer. If applied in layers, scrape off any cement skin that has formed and continue application. Dampen the surface before applying the next layer. Work mortar firmly into the surface of the masonry, including the corners, and under and around all mechanical anchors.

B. Build up repair material so that it is slightly above the adjacent masonry surface. Allow mortar 15 to 30 minutes to set slightly (wait time will vary with temperature and humidity-longer in cool weather), then scrape off excess material using a straight edge (a plasterer's miter rod is good for this). Do not press down or "float" the repair. Where repairs occur at panel edges or corners, form mortar to match the profile of the surrounding masonry. In all cases, finish repair so that it is as indistinguishable as possible from the adjacent masonry.

3.05 STONE MASONRY REPAIR MORTAR FINISHING TECHNIQUES

A. To obtain a smooth finish to match terra cotta, marble, or granite, the finished repair can be trowelled or "floated" to leave a smooth surface. This may cause the repair to lighten and may need to be stained or painted to match.

B. When finishing a granite repair, do not scrape the repairs as described above. The larger aggregate in the granite material will follow the screed, tearing the surface. The repairs should be left 1/16-1/8" high. Use a brush to remove the excess material from the over-built repair. White vinegar or diluted acid may be used to clean the aggregate after initial set.

G. Coarse aggregate or colored granite chips may be applied to the top surface only to match surrounding granite or precast concrete. Aggregate should be sifted and rinsed to ensure it is free of dust. Dampen the aggregate and press it firmly into the repair while the

mortar is still damp. Going over the repair with a bristle brush will remove excess mortar. Some experimentation will be necessary to achieve the desired texture.

H. Clean any mortar residue from area surrounding the repair by sponging as many times as necessary with clean water. This should be done before repair material sets.

I. After the repair has been cured and allowed to dry for at least one week, if the appearance of a repair does not meet the specifications of the job, the surface color of the repair may be enhanced by applying a vapor permeable, mineral based pigmented stain. Silin Lasur, a mineral pigmented stain is available from Cathedral Stone Products, Inc.

3.06 STONE MASONRY REPAIR MORTAR CURING

A. Lightly mist the repair with water to wet the entire surface of the finished repair approximately 30 minutes to 1 hour after completion on hot sunny days, and approximately 2 hours or longer, on cool or cloudy days. Time will vary with temperature and humidity. Mist several times a day on the three days following the repair installation. Should access to the repairs be impossible for a period of time, plastic may be used to cover them temporarily. The application of plastic, however, does not remove the need for normal curing techniques. Never cover repairs with plastic immediately after finishing-the water in the repair will be trapped on the surface, causing it to lighten.

3.07 POINTING PREPARATION

A. Existing mortar shall be removed to a minimum depth of 2-1/2 times the width of the joint. In all instances, remove all unsound mortar. Do not remove mortar in excess of one-third the depth of the masonry unit. Dust and debris should be removed from the joint by brushing, rinsing with water, or compressed air.

B. Joints should be dampened prior to pointing, but there should not be any standing water.

3.08 POINTING MORTAR MIXING

A. It is recommended that a dust mask be worn during mixing. Do not mix more material than can be used within 30 minutes. Discard any mixed material that has been unused for 30 minutes or more.

B. Mixing ratio:

1. Approximately 4 parts dry material to 1 part water:
The ratio is approximate. Adjustments to the amount of water must be made according to local weather conditions. Excessive

water will lighten the final color. Pointing mortar should be drier than setting mortar to help control color.

C. Add water to dry ingredients and mix well. Adjust amount of water according to the weather and the porosity of the substrate.

3.09 POINTING MORTAR APPLICATION

A. Jahn M110 Pointing Mortar can be applied in a single lift. Successive lifts with waiting periods between lifts are not necessary.

B. Apply pointing mortar to a dampened surface, packing the mortar into the joint to ensure full depth compaction. The mortar should be brought flush with the face of the masonry unit, and left to set for final tooling.

3.10 POINTING MORTAR FINISHING TECHNIQUES

A. After mortar joint has "set" (the time for this will vary depending on the depth of the application, dampness of the masonry, and local weather conditions). The joint should then be tooled to the desired finish. Do not allow mortar to harden before tooling, to prevent "burning" the joint.

B. Clean up should be done by brushing with a clean dry brush across the joint. If any mortar residue remains on the surface of the masonry unit, cleaning with clean water and a sponge is sufficient if done before the mortar dries. Cleaning with acids and/or power washers should not be necessary if good pointing practices are followed.

C. Do not allow pointing mortar beyond the face of the masonry unit. All edges of masonry shall remain visible. Pointing mortar should be applied to ensure this, or can be "raked" back slightly to expose edges of masonry, giving historic appearance.

3.11 POINTING MORTAR CURING

A. Periodically mist M110 joints using clean water for at least a 72 hours period. The timing for initial water misting will vary with ambient conditions. Hot, dry conditions may require misting within 30 to 60 minutes. Cooler, damp conditions may require waiting several hours before beginning the curing process. Mist several times a day. Should access to the repairs be impossible over a period of time, plastic may be used to cover them temporarily. The application of plastic, however, does not remove the need for normal curing techniques. Do not use water solvents immediately after applications to wash off excess mortar.

B. Dampening should begin as soon as the mortar has set sufficiently. Local weather conditions shall dictate the frequency, but hot weather requires this procedure to begin earlier (as soon as one

hour) and to be done more frequently. Finished pointing should be dampened for three to four days.

C. If mortar dries too rapidly, and does not bond, it shall be replaced at contractor's expense.

3.12 CLEAN UP

A. Do not use water or solvents immediately after application to wash off excess mortar.

B. Remove uncured mortar from the perimeter of the repair before it dries using clean water and a rubber sponge or dry brush. Repeat several times with clean water to prevent a halo effect (staining of adjacent masonry) Cured mortar may only be removed chemically or mechanically.

C. Remove uncured mortar from tools and equipment with water as soon as possible. Cured material may only be removed chemically or mechanically.

END OF SECTION

DIVISION 4 - MASONRY

SECTION 04200 - UNIT MASONRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK / SUMMARY:

A. Extent of each type of masonry work is indicated on drawings and schedule.

B. This Section includes unit masonry assemblies consisting of the following:

1. Concrete unit masonry.
2. Brick masonry.
3. Decorative concrete masonry units.
4. Pre-faced concrete masonry units.
5. Natural stone.
6. Concrete brick.
7. Mortar and grout.
8. Reinforcing steel.
9. Masonry joint reinforcement.
10. Ties and anchors.
11. Miscellaneous masonry accessories.

C. Related Sections include the following:

1. 03300 – Cast-In-Place Concrete
2. 05120 – Structural Steel
3. 06100 – Rough Carpentry
4. 07200 – Building Insulation
5. 07271 – Self-Adhered Non-Permeable Air Barrier Membrane
6. 07600 – Flashing
7. 07900 – Caulking
8. 07910 – Joint Sealers
9. 08110 - Steel Doors and Frames
10. 08211 – Flush Wood Doors
11. 08520 – Aluminum Windows

1.03 DEFINITIONS:

A. Reinforced Masonry: Masonry containing horizontal joint reinforcing and reinforcing steel in grouted cells.

B. Multi-Wythe Masonry: Masonry wall construction containing adjacent wythes of masonry with the same unit type without a cavity.

C. Composite Masonry: Masonry wall construction containing adjacent wythes of masonry with different unit type without a cavity.

D. Cavity Wall Masonry: Masonry wall construction containing adjacent wythes of masonry with different unit types separated with a continuous air space cavity in-between connected by metal ties.

E. Structural Masonry: Masonry wall construction constructed to be the main supporting structure of other building components such as a floor or roof.

1.04 PERFORMANCE REQUIREMENTS:

A. Provide structural unit masonry that develops indicated net-area compressive strengths (f'_m) at 28 days.

B. Determine net-area compressive strength (f'_m) of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

1.05 SUBMITTALS:

A. All Submittals shall be made in accordance with General Conditions Section G31.

B. Product Data: Submit manufacturer's product data for each type of masonry unit, accessory, and other manufactured products, including certifications that each type complies with specified requirements.

C. Shop Drawings: Submit shop drawings for the following:

1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.

2. Stone Trim Units: Show sizes, profiles, and locations of each stone trim unit required.

3. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement". Show elevations of reinforced walls.

4. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

5. Self-Adhering Sheet Flashing & Waterproofing Membranes: Detail all proposed application conditions, Submit manufacturer's data for membrane, primers, sealants, adhesives and associated auxiliary materials. Prior to commencing the Work, submit manufacturer's complete set of standard details for waterproofing systems.

D. Samples: Submit samples of the following materials:

1. Unit masonry samples in small scale form showing full extent of colors and textures available for each type of exposed masonry unit required.

2. Face brick, in the form of straps of five or more bricks. Include size variation data verifying that actual range of sizes for brick falls within ASTM C 216 dimension tolerances for brick where modular dimensioning is indicated.

3. Colored masonry mortar samples showing full extent of colors available.
4. Decorative concrete masonry unit samples for each type of exposed masonry unit required; include in each set the full range of exposed color and texture to be expected in completed work.

5. Include size variation data verifying that actual range of sizes for brick falls within ASTM C 216 dimension tolerances for brick where modular dimensioning is indicated.

6. Pigmented mortar. Make Samples using same sand and mortar ingredients to be used on Project. Label Samples to indicate types and amounts of pigments used. Show full extent of colors available.

7. Weep vents in color to match mortar color.

8. Accessories embedded in masonry.

E. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

1. Submittal is for information only. Neither receipt of list nor approval of mockup constitutes approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and submission of materials in accordance with this section have been provided for review by the Architect and approved in writing.

F. Material Certificates: Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards. Provide for each type and size of the following:

1. Masonry units. Include material test reports substantiating compliance with requirements.

2. Cementitious materials. Include brand, type, and name of manufacturer.

3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.

4. Grout mixes. Include description of type and proportions of

ingredients.

5. Reinforcing bars.

6. Joint reinforcement.

7. Anchors, ties, and metal accessories.

G. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1. Include test reports, per ASTM C 780, for mortar mixes required to comply with properties specification.

2. Include test reports, per ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

H. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

I. Cold-Weather Procedures: Submit a detailed description of methods, materials, and equipment to be used to comply with cold-weather requirements.

1.06 QUALITY ASSURANCE:

A. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1093 for testing indicated, as documented according to ASTM E 548.

B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.

C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from a single manufacturer for each cementitious component and from one source or producer for each aggregate.

D. Fire Performance Characteristics: Where indicated, provide materials and construction which are identical to those of assemblies whose fire resistance ratings have been determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

E. Field Constructed Mock-ups: Prior to installation of masonry work, erect sample wall panels to further verify selections made under sample submittals to demonstrate aesthetic effects and set quality standards for materials and execution, as well as for

color and textural characteristics of masonry units and mortar, and to represent completed masonry work for qualities of appearance, materials, and construction; build mock-ups to comply with the following requirements:

1. Locate mock-ups on site in locations indicated or, if not indicated, as directed by the Architect.

2. Build mock-ups for each type of exposed masonry in sizes of approximately 6' long by 4' high by full thickness, including face and back-up wythes as well as all accessories including but not limited to insulation and horizontal and vertical reinforcement.

3. Include a sealant-filled joint at least 16 inches long in exterior wall mockups.

4. Include through-wall flashing; with a 12-inch length of flashing left exposed to view (omit masonry above half of flashing).

5. Include metal/wood studs, sheathing, veneer anchors, flashing, and weep holes in exterior masonry-veneer wall mockup, when applicable.

6. Where masonry is to match existing, erect panels adjacent and parallel to existing surface.

7. Clean one-half of exposed faces of mockups with masonry cleaner as indicated.

8. Approval of mockups is for construction of full assembly, color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.

9. Protect mock-ups from the elements with weather resistant membrane.

10. Retain mock-ups during construction as standard for judging completed masonry work. When directed, demolish mock-ups and remove from site.

11. Pre-installation Conference to be after construction of mock-up but before proceeding with masonry work. Conduct pre-installation conference at Project Site.

1.07 FIELD QUALITY CONTROL:

A. Inspectors: Owner will engage qualified independent inspectors to perform inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform inspections.

1. Place grout only after inspectors have verified compliance of grout spaces and grades, sizes, and locations of reinforcement.

B. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections indicated below and prepare test reports:

1. Payment for these services will be made by Owner.

2. Retesting of materials failing to comply with specified requirements

shall be done at Contractor's expense.

3. Refer to Specification Sections 01450 & 01451 for additional Special Inspection requirements.

C. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.

D. Clay Masonry Unit Test: For each type of unit provided, per ASTM C 67.

E. Concrete Masonry Unit Test: For each type of unit provided, per ASTM C 140.

F. Mortar Test (Property Specification): For each mix provided, per ASTM C 780. Test mortar for mortar air content and compressive strength.

G. Grout Test (Compressive Strength): For each mix provided, per ASTM C 1019.

1.08 DELIVERY, STORAGE, AND HANDLING:

A. Deliver masonry materials and accessories to project in undamaged condition.

B. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, or other causes.

C. Store masonry units and cementitious material off the ground, on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If masonry units become wet, do not install until they are dry. Do not use cementitious materials that have become damp.

D. Store aggregates where grading and other required characteristics can be maintained, and contamination avoided.

E. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

F. Cold-applied elastomeric membranes should be stored in closed containers outdoors. Store membrane at temperature of 40˚F and above to facilitate handling. Membrane contains petroleum solvents and are flammable; do not use near open flame. Store roll materials horizontally; store adhesives and primers at temperatures of 40˚F and above to facilitate handling. Keep all solvents away from open flame or excessive heat.

1.09 PROJECT CONDITIONS:

A. Protection of Work: During construction, cover top of walls,

projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress.

1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

2. Where 1 wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.

3. Do not apply uniform floor or roof loading for at least 12 hours after building masonry walls or columns.

4. Do not apply concentrated loads for at least 3 days after building masonry walls or columns.

B. Stain Prevention: Prevent grout, mortar, or soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.

2. Protect sills, ledges, and projections from mortar droppings.

3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings and wash down detergent.

4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

C. Cold Weather Requirements:

1. Do not lay masonry units which are wet or frozen. Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions.

2. Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.

3. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

D. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40°F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.

E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

F. Perform the following construction procedures while masonry work is progressing. Temperature ranges indicated below apply to air temperatures existing at the time of installation except for

grout. For grout, temperature ranges apply to anticipated minimum night temperatures. In heating mortar and grout materials, maintain mixing temperature selected within 10°F (6°C).

1. 40°F (4°C) to 32°F (0°C):

   a. Mortar: Heat mixing water to produce mortar temperature between 40°F (4°C) and 120°F (49°C).

   b. Grout: Follow normal masonry procedures.

2. Do not heat water for mortar and grout to above 160°F (71°C).

G. Protect completed masonry and masonry not being worked on in the following manner. Temperature ranges indicated apply to mean daily air temperatures except for grouted masonry. For grouted masonry, temperature ranges apply to anticipated minimum night temperatures.

1. 40°F (4°C) to 32°F (0°C):

   a. Protect masonry from rain or snow for at least 24 hours by covering with weather-resistive membrane.

2. 32°F (0°C) to 25°F (-4°C):

   a. Completely cover masonry with weather-resistive membrane for at least 24 hours.

3. 25°F (-4°C) to 20°F (-7°C):

   a. Completely cover masonry with weather-resistive insulating blankets or similar protection for at least 24 hours, 48 hours for grouted masonry.

4. 20°F (-7°C) and below:

   a. Except as otherwise indicated, maintain masonry temperature above 32°F (0°C) for 24 hours using enclosures and supplementary heat, electric heating blankets, infrared lamps, or other methods proven to be satisfactory. For grouted masonry maintain heated enclosure to 40°F (4°C) for 48 hours.

H. Coordination: Ensure installation continuity of the waterproofing membranes scheduled for installation throughout the scope of this section. Work shall be so scheduled as to provide a watertight seal at the end of each working day on the areas worked upon during the day.

PART 2 - PRODUCTS

2.01 GENERAL

A. All specific products indicated within this section are to

establish a level of quality. Equivalency is permitted in accordance with General Municipal Law.

2.02 MASONRY UNITS, GENERAL:

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

2.03 CONCRETE MASONRY UNITS (CMU):

A. General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.

B. Concrete Block: Provide units complying with characteristics indicated below for grade, type, face size, exposed face, and, under each form of block included, for weight classification.

1. Size: Manufacturer's standard units with nominal face dimensions and thicknesses indicated on drawings.

2. Type II, non-moisture controlled units.

C. Hollow Load-Bearing Block: ASTM C 90 and as follows:

1. Weight Classification: Lightweight

2. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi.

3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.

4. All components (aggregate, cement, etc.) of CMU must be harvested within 500 miles of project site. (Required for LEED Projects only)

5. CMU to contain 20% post-industrial recycled content, by weight. (Required for LEED Projects only)

D. Concrete Building Brick: ASTM C 55.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2500 psi.

2. Weight Classification: Medium weight.

3. Size (Actual Dimensions): 3-5/8 inches wide by 3-5/8 inches high by 7-5/8 inches long.

E. Shapes: Provide shapes indicated and as follows:

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.

2. **All interior outside corners of CMUs shall have a 5/8" to 1" manufactured bullnosed edge. This requirement supercedes any details which may or may not be provided in the Contract Documents. All masonry bids shall include the cost of all necessary bullnose materials, at no additional costs to the Owner.**

2.04 VENEER BLOCK:

A. General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.

1. Provide special shapes where required for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.

2. Provide square-edged units for outside corners, except where indicated as bullnose.

3. Provide corner units where applicable and available.

B. Concrete Block: Provide units complying with characteristics indicated below for grade, type, face size, exposed face, and, under each form of block included, for weight classification.

1. Types included but not limited to the following:

a. Split-face
b. Split-face center score
c. Smooth-cast
d. Split Rib
e. Or as indicated on the drawings.

C. Size: Manufacturer's standard units with nominal face dimensions of 16" or 18” long x 8" high x 4" thick (15-5/8" or 17-5/8” x 7-5/8" x 3-5/8” actual).

D. Type I, moisture-controlled units.

E. Exposed Faces: Manufacturer's standard color and texture as selected by Architect unless otherwise indicated.

1. Where special finishes are indicated, provide units with exposed faces of the following general description matching color and texture of Architect's samples.

2. Where special patterns are indicated, provide units with exposed faces matching color, texture, and pattern of Architect's samples.

2.05 BRICK MADE FROM CLAY OR SHALE:

A. General: Comply with referenced standards and other requirements indicated below applicable to each form of brick required.

1. Size: Provide bricks manufactured to the following actual dimensions:

a. Standard Modular: 2-1/4" x 3-5/8" x 7-5/8".
b. Or as indicated on the drawings.

2. Provide special molded shapes where indicated and for application requiring brick of form, size, and finish on exposed surfaces which cannot be produced from standard brick sizes by sawing.

3. For sills, caps, and similar applications resulting in exposure of brick surfaces which otherwise would be concealed from view, provide uncored or unfrogged units with all exposed surfaces finished.

B. Facing Brick: ASTM C 216, and as follows:

1. Grade SW.
2. Type FBS (normal size and color variations).
3. Compressive Strength: 4,500 psi, minimum, per ASTM C 67.
4. Application: Use where brick is exposed, unless otherwise indicated.
5. Texture and Color: As indicated on drawings or as selected by Architect.

C. Building (Common Brick): ASTM C 62, and as follows:

1. Grade MW except Grade SW where indicated by ASTM C 62 grade requirements for applicable weathering index and exposure.

2. Application: Use where brick is indicated for concealed locations.

2.06 FIRE BRICK MASONRY:

A. General: Comply with referenced standards and other requirements indicated below applicable to each form.

B. Fire Brick: Provide units complying with characteristics indicated below for classification, P.C.E. rating, chemical percentage analysis, modulus of rupture, cold crushing P.S.I., porosity % and bulk density.

1. Classification: ASTM C-27-98 (2013), medium duty.
2. P.C.E.: Cone 29 3018 F.
3. Chemical Analysis:
   a. Silca: 59.90
   b. Alumina: 32.83
   c. Iron Oxide: 1.97
   d. Titanium Oxide: 1.48
   e. Calcium Oxide: .57
   f. Magnesium Oxide: .89
   g. Sodium Oxide: .49
   h. Potassium Oxide: 1.80
4. Modulus of Rupture: 1000-1200 PSI
5. Cold Crushing: 3500-4500 PSI
6. Apparent Porosity: 16-19%
7. Bulk Density: 130-134 lbs/ft
8. Method of Manufacturer: Dry Press

2.07 MORTAR AND GROUT MATERIALS:

A. General: Do not use admixtures, including coloring pigments, air entraining agents, accelerators, retarders, water repellant agents, anti-freeze compounds, or other admixtures unless otherwise indicated and approved by Architect.

1. Do not use calcium chloride in mortar or grout.
2. Limit cementitious materials in mortar to portland cement and lime.
3. Limit cementitious materials in mortar for exterior and reinforced masonry to portland cement and lime.
4. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
5. All new face brick mortars shall match existing face brick mortars where restoration work is required, samples of which shall be prepared and thoroughly tested for color, density, and uniformity before submitting samples for the approval of the Architect.

B. Option 1 – Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to project site.

C. Option 2 – Manual Blend: Combine and thoroughly mix cementitious materials, water, and aggregates in a mechanical batch mixer; comply with referenced ASTM standards for mixing time and water content.

D. Mortar for Unit Masonry: Comply with ASTM C 270, "Standard Specification for Mortar for Unit", Masonry Proportion Specification, for types of mortar required unless otherwise indicated.

1. For masonry below grade or in contact with earth, use Type M.
2. For reinforced CMU masonry, use Type S.
3. For brick masonry walls above grade, use Type N.
4. For exterior, above-grade, load-bearing and non-load-bearing CMU walls and parapet walls; for interior load-bearing CMU walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type S.
5. Analysis of the existing mortar to remain is required within the contract if the type required is not clear.

E. Portland Cement: ASTM C 150, "Standard Specification for Portland Cement", Type I, except Type III, may be used for cold weather construction. Provide natural color or white cement as required to produce required mortar color.

1. For colored pigmented mortars, use premixed colored masonry cements of formulation required to produce color indicated, or, if not indicated, as selected from manufacturer's standard formulations by

Architect.

2. Available Products: Subject to compliance with requirements, masonry cements which may be incorporated in the work include, but are not limited to, the following:

   a. ***"Atlas Custom Color Masonry Cement"***; Lehigh Portland Cement Company.

   b. ***"Glen-Gery Color Martar Blend"***; Glen –Gery Corporation.

   c. ***"Flamingo Color Masonry Cement"***; The Riverton Corporation.

F. For Manually Blended Colored Mortar Use Colored Mortar Pigments (for use with veneer brick and veneer block): Use pigments complying with ASTM C979, "Standard Specification for Pigments for Integrally Colored Concrete". Select and proportion pigments with other ingredients to produce color required. Do not exceed pigment to cement ratio of 1 to 10 by weight. Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with record of satisfactory performance in masonry mortars.

1. Available Products: Subject to compliance with requirements, colored mortar pigments which may be incorporated in the work include, but are not limited to, the following:

   a. ***"SGS Mortar Colors"***, Solomon Grind-Chem Services, Inc.

   b. ***"True Tone Mortar Colors"***; Davis Colors, a subsidiary of Rockwood Industries, Inc.

   c. ***"Bayferrox Iron Oxide Pigments"***; Bayer Corporation, Industrial Chemical Division.

G. Water: Clean and potable.

H. Hydrated Lime: ASTM C 207, "Standard Specification for Hydrated Lime for Masonry Purposes", Type S.

I. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207, Type S.

J. Aggregate for Mortar: ASTM C 144, "Standard Specification for Aggregates for Masonry Mortar".

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.

2. For joints less than ¼ inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.

3. White-Mortar Aggregates: Natural white sand or crushed white stone.

K. Aggregate for Grout: ASTM C 404, "Standard Specification for Aggregates for Masonry Grout".

L. Grout for Unit Masonry: Comply with ASTM C 476, "Standard Specification for Grout for Masonry", for grout for use in construction of reinforced and non-reinforced unit masonry. (Refer to Table 1 Conventional Grout Proportions by Volume. Use grout of consistency indicated or, if not otherwise indicated, of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout. Comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.

TABLE 1 Conventional Grout Proportions by Volume

Type	Parts by Volume of Portland Cement or Blended Cement	Parts by Volume of Hydrated Lime or Lime Putty	Aggregate, Measured in a Damp, Loose Condition	
			Fine	Coarse
Fine grout	1	0–1/10	2-1/4 –3 times the sum of the volumes of the cementitious materials	. . .
Coarse grout	1	0–1/10	2-1/4 –3 times the sum of the volumes of the cementitious materials	1–2 times the sum of the volumes of the cementitious materials

1. Use fine grout in grout spaces less than 2" in horizontal direction unless otherwise indicated.
2. Use coarse grout in grout spaces 2" or more in least horizontal dimension unless otherwise indicated.
3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.
4. The compressive strength of the grout shall match the compressive strength of the masonry f'm, but not less than 2,000 psi. The compressive strength of grout so specified should be determined according to ASTM C1019 (UBC 21-18).

M. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

1. Available Products:

   a. Addiment Incorporated: ***Mortar Kick***.
   b. Euclid Chemical Compnay; ***Accelguard 80***.
   c. Grace Construction Products, a unit of W.R. Grace & Co., ***Morset***.
   d. Sonneborn, division of ChemRex; ***Trimix-NCA***.

2.08 FIRE WALLS:

A. General: Comply with the referenced standards and other requirements indicated below as applicable to each type of fire wall construction required.

B. Provide masonry units and construction as required by Underwriter's Laboratories, Inc.; Design as indicated on the Contract Drawings.

1. If no specific designs are represented on the drawings, the following designs shall be utilized:

   a. 3-Hour Firewall – UL Design No. U904.
   b. 2-Hour Firewall – UL Design No. U905 or UL Design No. U906.

C. Provide complete fire wall assembly submittals independent of typical masonry submittals.

1. Only eligible manufacturers with products bearing the UL mark will be accepted for use in the construction of fire walls.

2.09 JOINT REINFORCEMENT, TIES, AND ANCHORING DEVICES:

A. Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form of joint reinforcement, tie, and anchor for size and other characteristics.

1. Zinc-Coated (mill galvanized) Steel Wire: ASTM A 82 for uncoated wire and with ASTM A 641 for zinc coating of class indicated below:

   a. Class 1: 0.40 oz. per square foot of wire surface.

   b. Application: Use for masonry not exposed to exterior or earth.

2. Hot-Dip Galvanized Steel Wire: ASTM A 82 for uncoated wire and with ASTM A 153 for zinc coating applied after prefabrication into units.

   a. Class B-2: 1.5 oz. per square foot of wire surface.

   b. Application: Use for all masonry back-up exposed to exterior.

3. Uncoated Steel Reinforcing Bars: Of size and locations as indicated on drawings, ASTM A615, Grade 60, deformed.

4. Stainless Steel Reinforcing Bars: AISI Type 304, ASTM A580, for historical masonry reconstruction projects.

B. Joint Reinforcement: Reinforcement to conform to Standard Specification ASTM A951 & ACI/ASCE 530 (Building Code Requirements for Masonry Structures). Provide welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet with prefabricated corner and tee units, and complying with requirements indicated below:

1. Width: Fabricate joint reinforcement in units with widths of approximately 2" less than nominal width of walls and partitions as required to provide mortar coverage of not less than 5/8" on joint faces exposed to exterior and 1/2" elsewhere.

2. Wire (Carbon Steel): Pre-fabricated construction from cold-drawn steel wire conforming to ASTM A 82:

Tensile Strength: 80,000 psi.

Yield Point: 70,000 psi, minimum.

3. Wire Diameter for Cross & Side Rods: Provide standard weight 9 gauge (.148”), typical.

C. Single-Wythe Masonry: Provide type as follows with single pair of side rods:

a. Provide Hohmann & Barnard, Inc. ***#220 Ladder Mesh Reinforcement*** - Ladder design with perpendicular cross rods spaced not more than 16" o.c.

b. Finish: Provide mill galvanized, per ASTM A 641.

D. Multi-Wythe Masonry: Provide type as follows:

a. Provide Hohmann & Barnard, Inc. ***#120 Ladder Mesh Reinforcement*** - Ladder design with perpendicular cross rods spaced not more than 16" o.c.

b. Finish: Provide mill galvanized, per ASTM A 641.

E. Masonry Joint Reinforcement for Cavity-Wall Masonry:

a. Provide Hohmann & Barnard, Inc. ***# 270-ML Ladder Adjustable Eye-Wire Reinforcement*** - Ladder design with perpendicular cross rods spaced not more than 16" o.c., Cross rods to be welded at 16” o.c; first cross rods to be welded 12” in from each end to allow for lap splices.

b. Finish: Provide hot-dip galvanized, after fabrication, per ASTM A 153.

F. Steel Stud Masonry Anchor System: (Where required) Provide ***X-Seal Anchor System with Byna-Lock Wire Ties***, as manufactured by *Hohmann & Barnard, Inc.*, 30 Rasons Court, Hauppauge, New York, 11788; tel (800) 645-0616; fax (631) 234-0683. website: www.h-b.com.

G. Reinforce each course of block cut back for fire extinguisher cabinets, electrical boxes and toilet accessory type recessed items. Mortar 9 gauge reinforcing wire in joints, that is 24-inches longer than recessed opening width on both sides.

H. All steel reinforcement to contain minimum 90 percent combined post-consumer and post-industrial recycled content. (Required for LEED Projects only)

2.10 TIES AND ANCHORS

A. Materials: Provide ties, reinforcing and anchors, specified in subsequent articles, made from materials that comply with this article, unless otherwise indicated.

1. Carbon Steel Wire: ASTM A 82.
2. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.
3. Products meeting specified products quantities by Hohmann &

Barnard, Inc. or Heckmann Building Products Inc.

4. Anchors and ties shall be 16 inches on center each way.
5. Horizontal reinforcing shall be 16 inches on center.

B. Joint Stabilizing Anchors: Provide Hohmann & Barnard, Inc., ***Slip-Set™ Stabilizer*** joint stabilizing anchors at veneer control joints and block interior wall, running wall, corner, "Tee", and "Ell" joints.

1. Provide joint stabilizing anchors at connection of new masonry to existing masonry or concrete walls.

2. Refer to Structural Drawings for additional requirements.

C. Rigid Anchors: Provide Hohmann & Barnard, Inc., #***344 - Rigid Partition Anchor,*** Z-Type bent steel shape 1-1/2 inches wide by 1/4 inch thick by 24 inches long or length required, with ends turned up 2 inches or with cross pins. (Rigid anchors can be used to connect T-intersections of CMU shear walls in lieu of masonry bonding or bond beams. (Used at T-intersections of other CMU walls and piers where indicated on drawings, although masonry bonding and T-shaped masonry joint reinforcement may be used.)

1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A 153/A 153M. (Rigid anchors may not be fully embedded in mortar or grout and, therefore, require a coating for corrosion protection.)

D. Mesh Wall Ties: Provide Hohmann & Barnard, Inc., ***MWT - Mesh Wall Tie,*** ½" square x 16-gauge, by width & length required; hot dip galvanized to ASTM A153 B2 finish.

E. Corrugated Wall Ties: Provide Hohmann & Barnard, Inc., ***CWT – Corrugated Wall Tie,*** 7" long x 16-gauge, or length as required; hot dip galvanized to ASTM A153 B2 finish.

F. Beam Strap Anchors: Provide Hohmann & Barnard, Inc., ***#364 Corrugated Gripstay Anchor*** 1-1/4 inch x 14 gauge, by length required; hot dip galvanized to ASTM A153 B2 finish.

G. Breakaway Fire Wall Anchors: Provide Heckmann Building Products, ***#134 Channel Slot Corrugated Anchor*** for masonry to structural steel beams and ***#196 Corrugated Notch Column Anchor*** for masonry to structural steel columns, 1-1/4 inch x 16 gauge, by length required; Zinc Alloy 710.

H. Masonry Column Anchors: Provide Hohmann & Barnard, Inc., #***353L - Column Anchor,*** 1-1/4 inch x 12 gauge, by length required; hot dip galvanized to ASTM A153 B2 finish or Hohmann & Barnard, Inc., #***354 - Notched Column Anchor (Corrugated Type),*** 1-1/2 inch x 12 gauge, by length required; hot dip galvanized to ASTM A153 B2 finish.

I. Partition Top Anchors: Provide Hohmann & Barnard, Inc., ***PTA Series Anchors - PTA 422,*** 12-gauge steel plate; hot dip galvanized to ASTM A153 B2 finish.

J. Adjustable Masonry-Veneer Anchors:

1. General: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, and as follows:

2. Screw-Attached, Masonry-Veneer Anchors: Units consisting of a wire tie and a metal anchor section.

   a. Provide Hohmann & Barnard, Inc., ***HB-200/DA-213 Adjustable Veneer Anchor,*** with two stainless steel fasteners #12 diameter each.

2.11 MISCELLANEOUS ANCHORS

A. Anchor Bolts: L-shaped steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of dimensions indicated.

B. Wedge Anchors: Anchors shall meet the physical requirements of Federal Specification A-A-1923A, Type 4. Anchors shall be non-bottom bearing type with a single piece steel expansion clip providing 360-degree contact with the base material and shall not require oversized holes for installation. Carbon steel anchors shall have an electroplated zinc finish or shall be mechanically galvanized in accordance with ASTM B695, Class 55, Type 1, as appropriate. Stainless steel anchors shall be type 303, 304 or 316. Anchors shall have an evaluation report issued by ICC-ES and have been tested in accordance with ICC-ES AC01 for all mandatory tests and including the following:

1. Seismic tension & shear
2. Combination of tension and shear loads
3. Critical and minimum edge distance

Unless otherwise noted, wedge anchors shall be ***"Wedge-All" Wedge Anchors*** by Simpson Strong-Tie (ICC-ES ESR-1396).

C. Sleeve Anchors: Anchors shall meet the physical requirements of Federal Specification A-A-1922A. Anchors shall be non-bottom bearing type with a single piece steel expansion sleeve providing 360-degree contact with the base material and shall not require oversized holes for installation. Carbon steel anchors shall have an electroplated zinc finish. Stainless steel anchors shall be type 304. Anchors shall have been tested in accordance with ICC-ES AC01 for the following:

D.

1. Static Loads
2. Critical and minimum edge distance and spacing

Unless otherwise noted, sleeve anchors shall be ***"Sleeve-All" Sleeve Anchors*** by Simpson Strong-Tie.

E. Postinstalled Veneer Anchors For Reconstruction Work: Provide

chemical anchors, with capability to sustain, without failure, a load equal to six times the load imposed when installed in solid or grouted unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

1. Corrosion Protection: Stainless-steel components complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 for bolts and nuts; ASTM A 666 or ASTM A 276, Type 304 or 316, for anchors.

2.12 CONCEALED FLASHING MATERIALS:

B. Thru Wall Flashing Membrane (where so noted on the drawings):

1. Through-wall Flashing Membrane (Self-Adhering) shall be ***Blueskin® TWF***, an SBS modified bitumen, self-adhering sheet membrane complete with a yellow engineered thermoplastic film; as manufactured by Henry Company, 909 North Sepulveda Blvd. Suite 650, El Segundo, CA, 90245; tel. (800) 598-7663; email: techservices@henry.com. Provide pre-fabricated inside & outside corners and end dams mitered and fully adhered, including ***Stainless Steel 3" Drip Plate*** and all required bonding accessories as standard to Base Bid. Provide pre-formed drip plate inside and outside corners with smooth uninterrupted hemmed drip edge.

   Membrane shall have the following physical properties:
   a. Membrane Thickness: 0.0394 inches (40 mils),
   b. Film Thickness: 4.0 mils,
   c. Flow (ASTM D5147): Pass @ 212 degrees F,
   d. Puncture Resistance: 134 lbf to ASTM E 154,
   e. Tensile Strength (film): 5000 psi minimum ASTM D 882,
   f. Tear Resistance: 45lbs.-MD, 17lbs.-CD to ASTM D1004,
   g. Low temperature flexibility: -22 degrees F to CGSB 37-GP-56M

C. Sheet Metal Counter Flashing (where so noted on the drawings): Fabricated from the following metal complying with requirements specified in Division 7 Section "Flashing and Sheet Metal" and below:

1. Copper: 7 oz. weight copper fabric flashing as manufactured by York for fully concealed flashing, and 16 oz. weight copper for cap flashing. Provide copper flashing where sloped glazing occurs.

2. At parapet cap stones use 16 oz. copper dove-tail flashing manufactured by Cheney Flashing Company.

3. Fabricate through-wall metal flashings with deformation in both directions for integral mechanical mortar bond.

4. Solder and Sealants for Sheet Metal Flashings: As specified in Division 7 Section "Flashing and Sheet Metal".

2.13 TRANSITION MEMBRANES: (where so noted on the drawings)

A. Primary sheet air/vapor barrier membrane shall be ***Blueskin® SA***, an SBS modified bitumen, self-adhering sheet membrane complete with a blue engineered thermoplastic film; as manufactured by Henry

Company, 909 North Sepulveda Blvd. Suite 650, El Segundo, CA, 90245; tel. (800) 598-7663; email: techservices@henry.com.

B. Primer: Primer for self-adhering membranes at temperatures above 25°F shall be Aquatac™ Primer manufactured by Henry, a polymer emulsion based adhesive, quick setting, having the following physical properties:

1. Color: Aqua.
2. Weight: 8.7 lbs/gal.
3. Solids by weight: 53%.
4. Water based, no solvent odors.
5. Drying time (initial set): 30 minutes at 50% RH and 70°F.

2.14 MISCELLANEOUS MASONRY ACCESSORIES:

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane or PVC.

B. Preformed Control Joint Strips: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Bond Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

D. Control Joint Block Shear Connector: Provide sash block either side of control joint and insert Hohmann & Barnard, Inc. ***RS Series - Rubber Control Joint*** in joint full height.

E. Control Joint Foam (Mortar Excluding) Filler: Provide Hohmann & Barnard, Inc., ***NS - Closed Cell Neoprene Sponge*** expansion joint in veneer control joints held back for bond breaker and sealant. Apply sealant at cavity face of block prior to applying vapor barrier to make building airtight.

1. Compressible Control Joint Foam Filler: Provide Hohmann & Barnard, Inc., ***NS - Closed Cell Neoprene Sponge*** with adhesive backing under shelf angles to allow for vertical veneer movement. Hold back for sealant and bond breaker.

F. Weepholes: Provide the following for weepholes:

1. Full Head Joint Weep Holes: Provide a full height open cell weep hole at base of wall above flashing and above steel lintels provided with thru-wall flashing.

2. Weep Vents (Top of Wall): Available Products; subject to compliance with requirements, weephole/ventilators which shall be incorporated in the work include, but are not limited to, the following:

a. "Hohmann and Barnard" No. 343, No. 343W Louvered Weep Hole. For use with Standard white and grey mortar.

b. "Hohmann and Barnard" No. QV-Quadrovent. For use with colored

mortars. Color as selected by Architect.

G. Cavity Drainage Material: Free-draining mesh, made from high density polyethylene strands (1" x 10" x 60") that will not degrade within the wall cavity; 90% open mesh weave.

1. Provide the following configuration:

a. Strips, full-depth of cavity and 10 inches high, with dovetail-shaped notches 7 inches deep that prevent mesh from being clogged with mortar droppings.

2. Products:

a. Mortar Net USA, Ltd.; "Mortar Net"
b. Hohmann and Barnard; "Mortar Trap"

H. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells. Units are formed from 0.142-inch steel wire, hot-dip galvanized after fabrication. Provide units with either two loops or four loops as needed for number of bars indicated.

1. Available Products:

a. Hohmann & Barnard, Inc.; #RB or #RB-Twin Rebar Positioner.
b. Heckmann Building Products Inc.; No. 376 Rebar Positioner.
c. Wire-Bond; O-Ring or Double O-Ring Rebar Positioner.

2.15 INSULATION:

A. Cavity wall closed cell expanded polystyrene insulation as indicated on drawings and specified in related sections. Refer to Specification Section 07219. Thickness as indicated on drawings.

1. Cavity wall assembly will utilize continuous rigid board cavity insulation adhered to CMU with all joints and penetrations sealed with spray foam sealant.

2.16 MASONRY CLEANERS:

A. Acidic Cleaner: Manufacturer's standard strength general purpose cleaner designed for new masonry surfaces of type indicated; composed of blended organic and inorganic acids combined with special wetting systems and inhibitors; expressly approved for intended use by manufacturer of masonry units being cleaned.

1. Available Products: Subject to compliance with requirements, a product which may be used to clean unit masonry surfaces includes, but is not limited to, the following:

a. "Sure Klean" No. 600 Detergent; ProSoCo, Inc.

PART 3 - EXECUTION

3.01 EXAMINATION:

A. Contractor shall examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

1. Prepare written report, endorsed by Installer, listing any conditions requiring correction prior to performance of work.
2. Verify that foundations are within tolerances specified.
3. Verify that reinforcing dowels are properly placed.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. Commencement of installation indicates acceptance of conditions preovied.

3.02 INSTALLATION, GENERAL:

A. Do not wet concrete masonry units.

B. Cleaning Reinforcing: Before placing, remove loose rust, ice, and other coatings from reinforcing.

C. Thickness: Build cavity and composite walls, and other masonry construction to the full thickness shown. Build single-wythe walls (if any) to the actual thickness of the masonry units, using units of nominal thickness indicated.

1. Build chases and recesses as shown or required for the work of other trades. Provide not less than 8" of masonry between chase or recess and jamb of openings and between adjacent chases and recesses.

2. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.

3. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible.

D. Matching Existing Masonry Work: Match coursing, bonding, color, and texture of new masonry work with existing work unless otherwise indicated or if there is a unit size different or joint thickness variation. Tooth-in new masonry when tying into existing unless otherwise indicated on the drawings.

D. Tuck Pointing: Mortar shall be pre-hydrated. The specified ingredients shall be mixed with only enough water to produce a damp mass of such consistency that it will retain its form when pressed

into a ball by the hands but will not flow under the trowel; then allowed to stand for not less than 1 hour nor more than 2 hours and remixed at once with the addition of enough water to produce satisfactory workability for immediate use. Tuck pointing is intended for use in repair work.

F. Select and arrange units for exposed brick unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed unless otherwise specifically indicated on documents.

3.03 CONSTRUCTION TOLERANCES:

A. Comply with construction tolerances in ACI 530.1/ASCE 6/TMS 602 and with the following:

B. Variation from Plumb: For vertical lines and surfaces of columns, walls, and arises, do not exceed 1/4" in 10", or 3/8" in a story height not to exceed 20', nor 1/2" in 40' or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4" in any story or 20' maximum, or 1/2" in 40' or more. For vertical alignment of head joints, do not exceed plus or minus 1/4" in 10', 1/2" maximum.

C. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed 1/4" in any bay or 20' maximum, nor 1/2" in 40' or more. For top surface of bearing walls, do not exceed 1/8" between adjacent floor elements in 10' or 1/16" within width of a single unit.

D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4" nor plus 1/2".

E. Variation In Mortar Joint Thickness:

1. For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch. Do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.

2. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.

F. Variation In Face Dimensions: For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

G. Variation In Alignment: For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

3.04 LAYING MASONRY WALLS:

A. Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to accurately locate openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half size units at corners, jambs, and, wherever possible, at other locations.

B. Lay-up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other work.

C. Pattern Bond: Lay exposed masonry in the bond pattern shown, or, if not shown, lay in running bond with vertical joint in each course centered on units in courses above and below. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2". Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4" horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: Stop work by racking back ½-unit length in each course; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

E. Built-in Work: As the work progresses, build-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items.

1. Fill space between hollow metal frames and masonry solidly with mortar unless otherwise indicated.
2. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.
3. Fill cores in hollow concrete masonry units with grout 3 courses (24") under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

F. Build non-load-bearing interior partitions full height of story to within 1” of underside of solid floor or roof structure above, unless otherwise indicated. Coordinate this work with all required firestopping requirements.

1. Install compressible filler in joint between top of partition and underside of structure above.
2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c., unless otherwise indicated.
3. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Division 7 Section "Fire-Resistive Joint Systems."

G. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, provide same type of bonding specified for structural bonding between wythes.

1. Provide continuity with horizontal joint reinforcement using prefabricated "T" units.

2. If construction sequence does not allow simultaneous construction of intersecting or abutting walls, provide mesh wall ties @ 16” o.c. vertical install in initial wall and leave hanging out for incorporation into secondary wall.

3.05 MORTAR BEDDING AND JOINTING:

A. Lay solid masonry units with completely filled bed and head joint; butter ends with sufficient mortar to fill head joints and place units. Do not slush head joints.

B. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.

C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

D. Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints.

E. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.

F. Interior Exposure Joints: Provide concave joints horizontal and vertical.

G. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners or jambs to shift adjacent stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

3.06 STRUCTURAL BONDING OF MULTI-WYTHE MASONRY:

A. Use continuous horizontal joint reinforcement installed in horizontal mortar joints for bond tie between wythes. Install at not more than 16" o.c. vertically.

B. Corners: Provide interlocking masonry unit bond in each course at corners, unless otherwise shown.

1. For horizontally reinforced masonry, provide continuity at corners with prefabricated "L" units, in addition to masonry bonding.

C. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, provide same type of bonding specified for structural bonding between wythes.

1. Provide continuity with horizontal joint reinforcement using prefabricated "T" units.

2. If construction sequence does not allow simultaneous construction of intersecting or abutting walls, provide mesh wall ties @ 16" o.c. vertical install in initial wall and leave hanging out for incorporation into secondary wall.

3.07 COMPOSITE MASONRY:

A. Bond wythes of composite masonry together using one of the following methods:

1. Individual Metal Ties: Provide ties as shown installed in horizontal joints, but not less than one metal tie for 2.67 sq. ft. of wall area spaced not to exceed 24 inches o.c. horizontally and 16 inches o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches of openings and space not more than 36 inches apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches o.c. vertically.

   a. Where bed joints of wythes do not align, use adjustable (two-piece) type ties.

2. Masonry Joint Reinforcement: Installed in horizontal joints.

   a. Where bed joints of both wythes align, use ladder-type reinforcement extending across both wythes.

   b. Where bed joints of wythes do not align, use adjustable (two-piece) type reinforcement with continuous horizontal wire in facing wythe attached to ties.

B. Bond adjacent wythes of composite masonry together using full collar joints.

C. Collar Joints: Solidly fill collar joints by parging face of first wythe that is laid and shoving units of other wythe into place.

D. Corners: Provide interlocking masonry unit bond in each wythe and course at corners, unless otherwise indicated.

1. Provide continuity with masonry joint reinforcement at corners by using prefabricated L-shaped units as well as masonry bonding.

E. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:

1. Provide individual metal ties not more than 16 inches o.c.
2. Provide continuity with masonry joint reinforcement by using prefabricated T-shaped units.
3. Provide rigid metal anchors not more than 24 inches o.c. If used with hollow masonry units, embed ends in mortar-filled cores.

4. If construction sequence does not allow simultaneous construction of intersecting or abutting walls, provide mesh wall ties @ 16" o.c. vertical install in initial wall and leave hanging out for incorporation into secondary wall.

3.08 CAVITY WALLS:

A. Tie wythes of cavity walls together using one of the following methods:

1. Ladder Type Pintel & Eye Joint Reinforcement: Installed in horizontal mortar joints where bed joints of both wythes align, use adjustable (two piece) ladder-type reinforcement on back-up masonry with pintel & eye extending across cavity securing veneer.

2. Individual Metal Ties: Provide ties as shown installed in horizontal joints, but not less than one metal tie for 2.67 sq. ft. of wall area spaced not to exceed 24 inches o.c. horizontally and 16 inches o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches of openings and space not more than 36 inches apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches o.c. vertically.

a. Where bed joints of wythes do not align, use adjustable (two-piece) type ties.

3. Masonry Veneer Anchors: Comply with requirements for anchoring masonry veneers.

B. Attempting to remove mortar fins from cavity or to trowel them flat against brick usually results in increased mortar droppings at base of cavity; keep cavities clean of mortar droppings and other materials during construction. Strike joints facing cavity flush. Bevel beds away from cavity, to minimize mortar protrusions into cavity.

C. Provide weepholes (full head open cell joints) in exterior wythe of cavity wall located immediately above ledges and flashing, spaced 24" o.c., unless otherwise indicated.

D. Provide weep vents in exterior wythe of cavity wall located at top of cavity walls at 24” o.c., unless otherwise indicated.

3.09 CAVITY WALL INSULATION:

A. Cavity insulation shall be installed continuously between lines of horizontal joint reinforcement butting edges flush. Adhere to back-up block and seal all joints with adhesive/sealer compatible with insulation, product as recommended by the insulation manufacturer.

B. Refer to Division 7 Section 07219 “Building Insulation” & Section 07231 “Air/Vapor Barrier System” for installation requirements applicable to continuous rigid insulation.

C. Provide insulation thickness as indicated on drawings.

3.10 HORIZONTAL JOINT REINFORCEMENT:

A. General: Provide continuous horizontal joint reinforcements as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" on exterior side of

walls, 1/2" elsewhere. Lap reinforcing a minimum of 6".

B. Cut or interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Reinforce walls with continuous horizontal joint reinforcing unless specifically noted to be omitted.

D. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections.

E. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

1. Space continuous horizontal reinforcement as follows:
   a. For multi-wythe walls (solid or cavity) where continuous horizontal reinforcement acts as structural bond or tie between wythes, space reinforcement as required by code but not more than 16" o.c. vertically.
   b. For foundation and parapet walls, space reinforcement at 8" o.c. vertically unless otherwise indicated.
2. Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and immediately below the sill. Extend reinforcement a minimum of 2'-0" beyond jambs of the opening except at control joints.
   a. In addition to wall reinforcement, provide additional reinforcement at openings as required to comply with the above.

3.11 CONTROL AND EXPANSION JOINTS:

A. General: Provide vertical and horizontal expansion, control, and isolation joints in masonry where shown. Build-in related items as the masonry work progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

1. Build-in horizontal pressure relieving joints where indicated; construct joints by either leaving an air space or inserting non-metallic compressible joint filler of width required to permit installation of sealant and backer rod.

   a. Locate horizontal pressure relieving joints beneath shelf angles supporting masonry veneer and attached to structure behind masonry veneer.

5. Build in vertical pressure relieving joints. Expansion joints shall be located in sizes and locations as shown on drawings.

6. Vertical control joints: unless otherwise noted, control joints shall be located as shown on drawings and/or in accordance with the ACI guidelines and specified herein. Location of all control joints shall be reviewed by Architect prior to proceeding with work.

   a. Vertical interior and exterior masonry control joints shall be ½" wide and filled with appropriate caulk.

b. Control joint spacing for exterior and interior walls:

Wall Height (FT)	Horizontal Joint reinforcing 16" O.C.
Up to 8 feet	25 ft O.C.
8ft to 12 ft	30 ft. O.C.
Over 12 ft.	35 ft. O.C.

c. Control joints for interior and exterior masonry shall be located at the following points of weakness or high stress concentrations:

1. At all abrupt changes in wall height.

2. At all changes in wall thickness, such as those at pipe or duct chases and those adjacent to columns or pilasters.

3. Above joints in foundations and floors.

4. Below joints in roof and floors that bear on the wall.

5. At a distance of not over one-half the allowable joint spacing from bonded intersections or corners.

6. At one or both sides of all door and window opening unless other crack control measures as used, such as joint reinforcement or bond beams.

B. Control joints in 2 hour fire rated CMU walls shall be as follows: Joint size maximum ½" with nominal ¾" diameter polyethylene backer rod compressed and installed into joint with minimum of ¼" thick fill materials applied within the joint flush with both surfaces of the wall as manufactured by "3M Company" - model # FD-150+. Note: All installations shall be in accordance with UL guidelines for joint systems.

3.12 ANCHORING MASONRY TO STRUCTURAL MEMBERS:

A. Anchor masonry to structural members as detailed and indicated within the Construction Documents or where masonry abuts or faces structural members to comply with the following:

1. Provide an open space not less than 1/2 inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar and other rigid materials.

2. Anchor masonry to structural members with anchors embedded in masonry joints and attached to structure.

3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

4. Coordinate anchors with flashing and air/vapor barrier requirements. Seal any penetrations necessary in flashing and air/vapor barriers.

B. Firewalls: Provide melt-away anchors at all firewalls to anchor

masonry to structural members as detailed and indicated within the Construction Documents when required for structural bracing.

3.13 LINTELS:

A. Install steel lintels of size and configuration shown where indicated in Construction Documents. Provide galvanized steel lintels at all exterior conditions where exposure to moisture is possible.

B. Provide minimum bearing of 6" at each jamb unless otherwise indicated.

3.14 FLASHING OF MASONRY WORK:

A. Refer to Division 7 Section 07231 "Air/Vapor Barrier System" for installation requirements applicable to through wall flashing.

B. General: Provide concealed self-adhering through wall flashing in masonry work continuous at base of wall at or above shelf angles, lintels, ledges, and other obstructions to the downward flow of water in the wall so as to divert such water to the exterior.

1. Prepare masonry surfaces smooth and free from projections which could puncture flashing. Seal penetrations in flashing with mastic before covering with mortar.

2. Place horizontal leg of through wall flashing on sloping bed of mortar and cover with mortar. Set stainless steel drip plate into minimum of ¼" bead of water block sealant, apply spray primer and allow to dry 4 to 5 minutes; within 30 minutes of setting primer set self-adhering through wall flashing onto drip plate set back from face of exterior face of masonry.

3. Extend flashing the full length of lintels and shelf angles and minimum of 4" into masonry each end then provide end dams at lintels and sills. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up typically two full cmu back-up courses (16") but a minimum of 4" where restricted, and through the inner wythe to within 1/2" of the interior face of the wall in exposed work. Where interior surface of inner wythe is concealed by furring, carry flashing completely through the inner wythe and turn up approximately 2". At heads and sills turn up ends not less than 2" to form a pan.

4. Install flashing to comply with manufacturer's instructions.

5. Provide fully open cell weep hole head joints of the first course of masonry immediately above concealed flashings. Space 24" o.c. unless otherwise indicated.

6. Install reglets and nailers for flashing and other related work where shown to be built into masonry work.

7. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in Part 2 "Cavity Drainage Material" Article.

8. Install vents in head joints at top course of just below or where indicated in exterior wythes at spacing indicated or 24" o.c. Use specified weep/vent products to form vents.

a. Close cavities off vertically and horizontally with treated wood blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

3.15 INSTALLATION OF REINFORCED UNIT MASONRY:

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.

2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602. Place reinforcement of size and type and spacing as indicated in structural drawings.

C. Grouting: Grout reinforced cores full height in coordination with and as indicated on structural drawings. Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 60 inches.
3. The use of mortar to fill the cells is not permissible.

3.16 INSTALLATION OF SELF-ADHERING TRANSITION MEMBRANES:

A. Refer to Division 7 Section 07231 "Air/Vapor Barrier System" for installation requirements applicable to self-adhering transition membranes.

B. General: Provide self-adhering transition membranes locations including window & door openings, top of wall covering wood blocking tied into roofing, changes in materials, across expansion joints, around penetrations, structural steel exposed within the cavity and wherever indicated on the construction documents.

1. Coordinate installation of transition membranes with other materials utilized as part of the air/vapor barrier system utilizing compatible products.

2. Install transition membranes to comply with manufacturer's instructions.

3.17 REPAIR, POINTING, AND CLEANING:

A. Remove and replace masonry units which are loose, chipped, broken, stained, or otherwise damaged, or if units do not match adjoining

units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge any voids or holes, except weepholes, and completely fill with mortar. Point up all joints including corners, openings, and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly sets and cured, clean masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.

2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of installed masonry.

3. Fully clean installation of exterior masonry with specified cleaner; apply and rinse, remove in accordance with manufacturer instructions.

4. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.

5. Saturate wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

6. Use bucket and brush hand cleaning method described in BIA "Technical Note No. 20 Revised" to clean brick masonry made from clay or shale, except use masonry cleaner as indicated in Part 2 “Masonry Cleaners” Article.

7. Clean exterior finished concrete unit masonry to comply with masonry manufacturer's directions and applicable NCMA "Tek" bulletins.

E. Protection: Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures unit masonry work being without damage and deterioration at time of substantial completion. Protect waterproofing membrane and drain board work from other trades during construction. Backfill with specified materials, protect membrane from damage.

3.18 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, recycle or remove all surplus materials from the Project site(s).

END OF SECTION

DIVISION 4 - MASONRY

SECTION 04500 - MASONRY RESTORATION AND CLEANING

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Work Included:

1. Provide all labor, materials, and equipment necessary and required to repair and/or replace all existing cracked, chipped, spalled, and loose masonry and tuckpoint existing masonry joints as indicated on the drawings and specified herein.

2. Provide all labor, materials, and equipment necessary and required to clean existing masonry surfaces as indicated on the drawings and specified herein.

1.02 RELATED SECTIONS

1. Section 04200 - Unit Masonry.

3. Section 07900 - Caulking and Sealants.

1.03 SUBMITTALS:

A. Comply with the requirements of Section 01300 - Submittals and as modified below.

B. Product Data:

1. Brick or other masonry units: Submit manufacturer’s product data, include size variation data verifying that actual range of sizes for brick falls within ASTM C 216 dimension tolerances for brick where modular dimensioning is indicated.

2. Masonry cleaning products: Submit manufacturer's product literature and application instructions demonstrating compliance with specified requirements.

3. Premixed pigmented pointing mortar: Submit manufacturer's product literature and application instructions demonstrating compliance with specified requirements.

4. Components of site-mixed pointing mortar (where mortar type or building age dictate): Submit manufacturer's product literature demonstrating compliance with specified requirements.

5. Flashings, backer rod, sealant, etc: Submit manufacturer's product literature and application instructions demonstrating compliance with specified requirements.

C. Samples:

1. Masonry units: Submit 3 samples of each type of replacement masonry unit.

a. Unit masonry samples for each type of exposed masonry unit required; include in each set the full range of exposed color and texture to be expected in completed work.

b. Include size variation data verifying that actual range of sizes for brick falls within ASTM C 216 dimension tolerances for brick where modular dimensioning is indicated.

2. Colored masonry mortar samples for each color required showing the full range of color which can be expected in the finished work. Label samples to indicate type and amount of colorant used.

3. Site-mixed pointing mortars must be prepared on-site.

1.04 QUALITY ASSURANCE:

A. Qualifications:

1. Masonry Cleaning:

a. Manufacturer: Regularly engaged in manufacturer of masonry cleaning products with at least 5 completed applications of materials to be provided in this project.

b. Applicator: Experienced with use of masonry cleaning products. Provide documentation of such experience when requested by the Architect.

c. For buildings designated Historic by the NYOPRHP, or those eligible for listing on the National Register of Historic Places, the Contractor is obligated to follow the National Park Service Preservation Brief No. 1, *Assessing Cleaning and Water-Repellant Treatments for Historic Masonry Buildings.* Low-pressure water washing (below 250 psi) and gentle non-ionic detergents are to be used.

2. Tuckpointing:

a. Tuckpointing work is only to be performed by a qualified and experienced tuckpointing craftsman. Field mock-ups required below are to be prepared by those who will

perform the masonry work.

b. Contractor is obligated to follow the National Park Service Preservation Brief No. 2, *Repointing Mortar Joints in Historic Masonry Buildings*.

B. Field Samples/Mock-ups:

1. Masonry Repointing: In area selected by Architect, repoint a nine (9) square foot area of brick masonry in accordance with specified requirements for Architect's approval. Obtain Architect's approval of sample area before proceeding with masonry repointing.

a. One field sample/mock-up shall be provided for each of three mortar samples, either pre-mixed, site-mixed, or both, selected by the Architect for a final decision by the Architect and/or Owner. Mock-ups shall be repeated until a satisfactory match is obtained.

c. Prior to pointing, sample area shall first be prepared for review of joint cutting depth and extent. Architect shall be notified when this preparation step is ready for review so it can be approved and process can advance to pointing approvals.

2. Masonry Replacement: In area selected by Architect, replace a nine (9) square foot area of brick masonry in accordance with specified requirements for Architect's approval. Obtain Architect's approval of sample area before proceeding with masonry repointing.

a. One field sample/mock-up shall be provided for each of three brick samples selected by the Architect for a final decision by the Architect and/or Owner. Mock-ups shall be repeated until a satisfactory match is obtained.

1.05 DELIVERY, STORAGE, AND HANDLING:

A. Storage and Protection:

1. Protect masonry restoration materials during storage against wetting by rain, snow, or ground water, and against soilage or intermixture with other materials.

a. Mortar and grout materials: Store in a dry location or in waterproof containers, tightly closed and away from open flames. Protect liquid components from freezing, and comply with manufacturer's recommendations for minimum/maximum temperature requirements.

2. Store all materials in single place approved by Architect, kept clean and neat. Correct damage to storage area and

surroundings.

1.06 EXAMINATION OF THE SITE:

A. The Contractor shall visit and thoroughly familiarize himself with the site and with the scope of work to be done. He is advised to carefully examine any and all existing conditions which would affect the cost of the required work under the contract and to judge for himself conditions which will exist when he carries out his contract, as he will be entitled to no extra compensation for any work required by field conditions.

B. When the Contractor submits his proposal, it will be interpreted to mean that he has examined the site, fully understands the existing proposed conditions, and he has made due allowances for them in his proposal.

1.07 SCAFFOLDING:

A. Furnish, install, and maintain safe, OSHA approved scaffolding and/or other staging equipment throughout the duration of the entire project. Safe and compliant work process is the full responsibility of the contractor.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Mortar Materials:

1. Portland cement: ASTM C150, Type 1.

   a. Type III may be used to reduce protection requirements for laying masonry in cold weather, if approved in advance by Architect.
   b. Provide white or gray cement as required to produce required mortar color.

2. Lime: Hydrated, complying with ASTM C207, Type S.

3. Sand: Clean, white washed with 100 percent passing No. 16 sieve and complying with ASTM C144.

4. Mortar color compounds: Inorganic used in proportions recommended by manufacturer, but not exceeding 15 percent of cement weight. Do not exceed 3 percent of cement weight for carbon black.

5. Fine aggregate (for grout): No. 1 sand complying with ASTM C404.

B. Brick Units: Face brick units matching color, texture, and size of

existing face brick, and complying with ASTM C216, Type FBX.

C. Acidic cleaner for areas scheduled to receive substantial quantities of brick replacement (effectively "new" brick areas): Manufacturer's standard strength general purpose cleaner designed for new masonry surfaces of type indicated; composed of blended organic and inorganic acids combined with special wetting systems and inhibitors; expressly approved for intended use by manufacturer of masonry units being cleaned.

1. "Sure Klean" No. 600 Detergent; ProSoCo, Inc.

2. Protect areas of existing brick that are not being replaced that may be above, below, and adjacent to the replaced brick from the acidic cleaner.

D. For areas of heavy atmospheric staining, paint oxidation, carbon buildup and other atmospheric pollutants, use:

1. Sure Klean Heavy Duty Restoration Cleaner NE.

2.02 ACCESSORIES

A. Through-Wall Flashing:

1. Copper fabric flashing, 5 oz., asphalt-free (red):

a. York Multi-Flash 500 series York Manufacturing Inc., Sanford, Maine.

2. Provide pre-fabricated inside corners, outside corners, and end dams.

B. Copper Counter Flashing:

1. 16 oz. soft copper broken to match profile indicated on drawings.

C. Backer Rod:

1. Closed cell foam of diameter required by condition.

D. Caulk:

1. Single component gun-grade urethane sealant.

2.03 MIXES

A. Mortar and Grout - Brick Masonry:

1. Mortar proportions - Type N (by volume) ASTM C270: 1 part Portland cement; 1 part hydrated lime; and 6 parts sand

measured in damp, loose condition and constituting not less than 2-1/4-inch not more than 3 times total volume of cement and lime (1:1:4½-6).

2. Grout proportions - Fine Grout (by volume ASTM C476: 1 part Portland cement; 0-1/10 part lime; and same equal to 2-1/4 to 3 times total volume of cement and lime.

3. Mixing: Thoroughly premix Portland cement, hydrated lime, and aggregates; then add water and mix for minimum 5 minutes in mechanical batch mixer.

   a. For mortar, add as much water as required for workability. Retemper mortar by adding water and remixing as required for workability, but only within first 2½ hours of pot life.

   b. Do not use mortar or grout which has begun to set or which is more than 2-1/2 hours old since initial pre-hydration. Do not add water to retemper old mortar after this point.

   b. Do not add air entraining agents or other admixtures to mortar or grout materials specified.

   c. Color compounds are to be added in accordance with manufacturer's recommendations.

4. Pre-mixed, pre-bagged colored mortars may be acceptable when submitted for review and approved. Acceptable manufacturers are:

   a. Norval

   b. Sandell

5. Mortar shall be high in lime content, and softer than existing brick and no harder than existing mortar.

PART 3 - EXECUTION

3.01 REPOINTING

A. Joint Preparation:

1. The contractor shall protect all existing window and door openings and adjacent materials and surfaces from damage during the pointing process. Any damage incurred shall be corrected by the contractor at no additional cost to the owner.

2. With a toothing chisel or pointers grinder, carefully remove

all existing deteriorated all joints found to be loose, weak, broken, or structurally defective until firm mortar is reached, but not less than 3/4". Remove joints with the following conditions for spot pointing:

a. Loose or crumbling mortar.

b. Soft and sandy mortar which can be removed without excessive pressure by hand scraping with blunt end of pointing tool.

c. Hollow spaces concealed, or partially concealed by shell of mortar.

d. Joints containing cracks between mortar and masonry where a 34 gauge W & M wire can be inserted 1/2" or more.

e. Where mortar has eroded from the face of the masonry.

f. Where hairline cracks are apparent in the mortar.

g. Where the bond between the masonry and mortar is broken.

h. Where there is plant growth in or around the mortar joint.

3. When documents indicate 100% pointing or "full" pointing of a building face or similar area, the following additional preparation is required:

a. All mortar joints which are sound and do not require repointing due to deterioration shall be partially removed to a uniform depth, minimum ¾" and repointed to match newly pointed joints.

a. Joints which have been previously pointed shall also be partially removed and repointed to match new joints.

b. Remove all mortar joints deteriorated or sound for a project where 100% pointing is indicated.

4. Prior to applying new mortar, clean-out all loose material, debris, and dust.

5. Wet joints before applying new mortar. Allow water to soak into joints, but joints should not be visibly wet with free standing water during repointing.

a. Architect reserves the right to inspect any and all joints prepared by contractor before proceeding with repointing.

B. Joint Filling:

1. The tuckpointing mortar should be prehydrated to a damp workable consistency which will retain its shape when formed into a ball. Note: Allow mortar to stand in this dampened condition for 1 to 1 1/2 hours.

2. Fill mortar joints in layers not over 1/4" thick, with each layer applied with pressure as soon as previous layer has partially dried. Leave surface of each layer rough; do not tool smooth until final layer is applied.

3. Compress final packing as much as possible to completely fill joint. Compact joints solidly before final tooling.

C. Tooling and Curing:

1. When final mortar layer is thumbprint hard, tool joint to match adjacent existing masonry, or of 100% pointing is required, then tool joints concave. Take care to not spread mortar over edges of brick onto exposed surfaces. Do not feather edge mortar.

2. Following tooling, remove excess mortar from edge of joint.

3. Allow joints to cure for at least 5 days, maintaining in damp condition using water hoses and fine spray mist.

4. The final appearance of the façade shall be uniform in terms of mortar coloration, tooling, and size of joints. Joints shall be tooled to match existing, or where the entire wall is being redone, new joints shall be tooled concave.

5. After completion of pointing work, all loose mortar and mortar staining shall be cleaned from surface of masonry.

3.02 BRICK REMOVAL AND RECONSTRUCTION

A. Removal and replacement (this work is generally to be completed prior to overall pointing):

1. Where the existing bricks units are defective, or are damaged as part of the restoration, cut out the old mortar surrounding the affected units and remove the brick. Chisel out all old mortar and remove all dust and debris, being careful not to allow debris to fall into the cavity. Dampen surrounding brick surfaces and place new unit of similar size and coloration into opening.

a. Defects warranting replacement include, but are not limited to, spalled units, units with subflouresence, previously sandblasted units, units where fired face has weathered off, cracked, and broken units.

2. Support and protect masonry to remain surrounding removal area. Clean edges of masonry to remain by removing mortar, dust, or loose debris.

B. Reconstruction:

1. Install new through-wall flashing where indicated on Drawings or where required by performance of the work in accordance with manufacturer's installation recommendations. Provide full head joint weep holes above flashings at 24" o.c. staggered.

2. Fit replacement masonry units into bonding and coursing pattern of existing masonry. Lay units with completely filled bed, head, and collar joints. Butter ends sufficiently to fill head joints and shove into place. Maintain joint width to match existing masonry and tool to match existing masonry, or concave if a full area project.

3. Use motor-driven saw/grinder designed to cut masonry with clean, sharp, unchipped edges where cutting is required.

C. Sawcutting of new control/expansion joints:

1. At locations indicated on the Drawings, sawcut a ½" wide joint the full height of the wall area and fully through the depth of the brick or veneer wythe. Provide backer rod and caulking full height.

D. Tooling and Curing:

1. Joint filling, tooling, and curing shall be the same as described under 3.02.C.

3.03 FLASHING OF MASONRY WORK:

A. General: Provide concealed flashing in masonry work at or above shelf angles, lintels, ledges, and other obstructions to the downward flow of water in the wall so as to divert such water to the exterior. Prepare masonry surfaces smooth and free from projections which could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with mastic before covering with mortar. Extend flashings through exterior face of masonry and cut back flush after mortar has cured.

1. Extend flashing the full length of lintels and shelf angles and minimum of 4" into masonry each end. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4", and through the inner wythe to within 1/2" of the interior face of the wall in exposed work where inner wythes can be disturbed by the work. Where interior surface of inner wythe is concealed by furring, carry

flashing completely through the inner wythe and turn up approximately 2". At heads and sills turn up ends not less than 2" to form a pan.

2. Where new flashings are installed in a solid wall construction (often pre 1950s), terminate to inner course with a continuous termination bar sealed at the top edge in best condition to prevent passage of moisture beyond line of flashing.

3. Where new flashings are installed in a "Larsen System" type wall (often 1950s to early 1960s consisting of CMU backup with brick headers and staggered flashings), attempt to lift higher layer of existing flashing and install new flashing below, positively lapping and sealing existing flashing to new. If this is not possible, then provide continuous termination bar and sealant above to existing backup condition.

4. Where new flashings are installed in a cavity-type construction (often mid-1960s to present), provide continuous termination bar to backup masonry and seal top edge.

5. Interlock end joints of flashings not less than 1-1/2" and seal lap with compatible sealant or flashing cement.

6. Install flashing to comply with manufacturer's instructions.

7. Provide full head joint weep holes in the head joints of the first course of masonry immediately above concealed flashings. Space weep holes at 24" o.c. unless otherwise indicated.

8. Install reglets and nailers for counter flashing and other related work where shown to be built into masonry work, or install counterflashing below through wall flashing to maintain positive drainage flow.

3.04 REMOVAL AND REPLACEMENT OF CONTROL/EXPANSION JOINT CAULKING AND CAULKING OF NEW JOINTS

A. Where control and/or expansion joints exist within the areas of masonry work that are being reconstructed, remove existing joint filler material and provide new foam backer rod and caulking for the full extent of the joint. This shall be done in coordination with pointing but before cleaning unless cleaners are not compatible with the caulking proposed. If incompatible, then perform caulking after cleaning.

B. Where new control and/or expansion joints are indicated, coordinate with the work of 3.02 and 3.03.

3.05 POST-CONSTRUCTION DETERGENT CLEANING

A. Final Cleaning: After mortar is thoroughly sets and cured, clean masonry with detergent as follows:

1. Cleaners shall be applied and removed in accordance with manufacturer’s instructions.

2. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.

3. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.

4. Protect non-masonry surfaces (adjacent windows, doors, panel systems, etc.) from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.

5. Saturate wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

6. Use bucket and brush hand cleaning method described in BIA "Technical Note No. 20 Revised" to clean brick masonry made from clay or shale, except use masonry cleaner where indicated on the drawings.

7. Clean concrete unit masonry to comply with masonry manufacturer's directions and applicable NCMA "Tek" bulletins. Restoration cleaners indicated herein are not suitable for use on concrete masonry.

8. Clean limestone units to comply with recommendations in "ILI Handbook" published by Indiana Limestone Institute of America.

B. Where detergent is determined to be too harsh or otherwise unsuitable for cleaning, then clean according to 3.07 below.

3.06 POST-CONSTRUCTION MECHANICAL AND WATER CLEANING

A. Remove excess mortar, sealant, or other material from face of masonry as repointing or masonry rebuilding progresses.

B. Allow completed restoration to cure for approximately 30 days, then thoroughly clean exposed masonry surfaces with stiff nylon bristle brushes and clean water under normal pressure.

1. Do not use metal scrapers or metal brushes.

2. Do not use acid or alkali cleaning agents.

3.07 PROTECTION

A. Provide protection of work and maintain protective conditions in a manner acceptable to the Owner, which ensures the work will be without damage or deterioration to the time of substantial completion.

END OF SECTION

DIVISION 4 - MASONRY

SECTION 04700 – SIMULATED STONE VENEER

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. The Contractor shall be responsible for the supply and installation of new simulated masonry, including manufactured stone veneer and associated trim and accessories, at all locations as indicated on the Contract Drawings. Supply all labor, materials and equipment necessary to provide and complete and proper finished product.

1.02 RELATED SECTIONS:

A. Section 04200 – Unit Masonry

B. Section 05120 – Structural Steel

C. Section 05400 – Cold Formed Metal Framing

D. Section 06100 – Rough Carpentry

E. Section 07231 – Air / Vapor Barrier System

F. Section 07271 – Self-Adhered Non-Permeable Air Barrier Membrane

G. Section 07600 - Flashing and Sheet Metal

H. Section 07602 – Flashing

I. Section 07900 – Caulking

J. Section 07910 – Sealants

K. Related LEED Sections include the following (where applicable):

1. Division 1 Section *"LEED Requirements"* for recycled content and regional materials requirements, submittals and additional LEED requirements.

2. Division 1 Section "Construction Waste Management" for recycling construction waste.

1.03 REFERENCES:

A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.

B. American Concrete Institute (ACI)

C. American Society for Testing and Materials (ASTM):

1. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

2. ASTM C67 – Standard Test Methods of Sampling and Testing Brick and Structural Clay Tile.

3. ASTM C91 - Specification for Masonry Cement.

4. ASTM C150 - Specification for Portland Cement.

5. ASTM C177 – Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.

6. ASTM C192 – Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory

7. ASTM C207 – Standard Specification for Hydrated Lime for Masonry Purposes

8. ASTM C270 – Standard Specification for Mortar for Unit Masonry.

9. ASTM C482 - Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement.

10. ASTM C567 – Standard Test Method for Unit Weight of Structural Lightweight Concrete.

11. ASTM D226 – Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.

12. ASTM E2556 / E2556M – Standard Specification for Vapor Permeable Flexible Sheet Water Resistive Barriers Intended for Mechanical Attachment.

D. Underwriters Laboratories, Inc. (UL):

1. UL 723: Test for Surface Burning Characteristics of Building Materials.

E. Building Materials Evaluation Commission

F. Uniform Building Code (UBC) / International Code Council (ICC):

1. ES Report.

2. UBC Standard No. 14-1, Kraft Waterproof Building Paper.

3. UBC Standard No. 32-12 for Water Absorption.

4. UBC Standard No. 26-10 Parts I and IV: Test Method for

Compressive Strength of Cylindrical Concrete Specimens.

G. LEED (where applicable): US Green Building Council's *Leadership in Energy and Environmental Design Green Building* Rating System.

H. Masonry Standards Joint Committee (MSJC) of The Masonry Society.

I. U.S. Department of Housing and Urban Development (HUD): Material Release Number

1.04 CERTIFICATIONS:

A. Provide the following certifications to qualify the manufacturer:

1. Current ICC-ES Report;

2. UL: Classification File Number;

3. HUD: Material Release Number;

1.05 SUBMITTALS:

A. General: All submittals shall be in accordance with the provisions of Section 01300.

B. Product Data: Submit manufacturer's product data for all manufactured masonry products and accessories, as well as application materials, including mortar color charts, and water resistive barrier.

C. Samples: Submit a selection of panels containing full-size samples of the specified manufactured masonry, showing full range of colors and textures, complete with specified mortar. Actual size of masonry sample to be approximately 12 inches by 12 inches. Panel samples shall be for approval of finishes, colors and textures. Provide colored mortar sample kits of all available mortar tints, for inclusion into the project. Provide samples of all accessory components.

D. Quality Assurance/Control Submittals:

1. Test Reports: Certified test reports, showing compliance with the specified performance characteristics and physical properties.

2. Certificates: Provide ICC-ES Reports, product certificates signed by the manufacturer, certifying that materials comply with specified performance characteristics and criteria, and physical requirements.

3. Qualifications: Submit proof of manufacturer qualifications and proof of installer qualifications. Installer to be certified by the manufacturer as qualified to install their system.

4. Manufacturer's Instructions: Submit manufacturer's installation instructions.

5. Manufacturer's Field Reports: During construction, submit manufacturer's field reports specified herein. (1.06 and 3.05)

6. LEED Submittals (where applicable): Submit recycled content and regional materials documentation for each type of product provided under work of this Section in accordance with Section 01352 *"LEED Requirements"*. Provide Credit MR 5.1 – Local/Regional Materials; indicate location of manufacturer of the manufactured masonry and the distance from the manufacturer to the job site. Provide Credit EQ 4.1: Manufacturers' product data for interior field-applied adhesive and sealant products included in this section, including printed statement of VOC content in accordance with Section 01352 *"LEED Requirements"*.

E. Closeout Submittals: Submit the following:

1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Section 01700 Project Closeout. Provide certified maintenance data and operation data manual. Include methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.

2. Warranty: Warranty documents specified herein shall be project-specific, indicating project name and Owner on all submitted warranties.

1.06 QUALITY ASSURANCE:

A. Qualifications: Manufacturer shall be a firm with a minimum of five (5) years experience in producing manufactured simulated masonry, and shall be a recognized member of the following organizations: MSJC, ACI and ASTM. Installer shall be a company with documented experience in the installation of manufactured masonry including a minimum of (5) projects within a 400-mile radius of this project.

B. For projects over 1,000 square feet of installed product, the manufacturer shall provide field representation during construction, shall review and approve the installation and shall direct any corrective work required.

C. Regulatory Requirements: All products shall be tested and listed by Underwriter's Laboratories, Inc., and shall be in conformance to all applicable local and state code requirements.

D. Project Mock-Up: In order to establish a standard by which all work shall be judged, the General Contactor shall assemble a 4'-0" x 4'-0" project mock-up, at an on-site location as determined by the Architect. Install on-site, using acceptable products and manufacturer approved installation methods. Mock-up shall incorporate penetration and termination details, corner detail and proposed mortar color and tooling. Obtain the Owner's and the Architect's acceptance of the finish color, texture and pattern, as well as workmanship standard. Comply with all Division 1 quality

control provisions.

1. Mock-Up Size: Assemble at 4’-0” x 4’-0” sample panel at the job site at location as directed by the Architect.

2. Pattern: Illustrate field pattern of stone, and color and tooling of joints.

3. Maintenance: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of the mock-up when no longer deemed by the Architect as required.

4. Incorporation: Mock-up may be incorporated into final construction, pending the Architect’s approval. If not approved, Contractor shall have a suitable amount of surplus material ready for final installation.

E. Pre-Installation Meetings: Coordinate and conduct pre-installation meeting to verify the project requirements, substrate conditions, manufacturer’s installation instructions, and manufacturer’s warranty requirements. Attendees shall include the Prime Contractor, the manufacturer’s field representative, the Installing Contractor (if different), the Owner, the Architect, and the Owner’s Representative (as applicable).

F. Product System Technical Data:

1. Shipping Weight of Manufactured Units: 8 - 12 psf. Maximum veneer unit weight: 15.0 psf.

2. Compressive Strength: Tested in accordance with ASTM C39 and C192: greater than 1,800 psi @ 28 days. UBC Standard No.26-10, Parts I and IV.

3. Shear Bond Test (Adhesion): Tested in accordance with ASTM C482: Bond between stone unit, Type S mortar and backing shall be greater than 50 psi, using a unit thickness approximately the same as the stone unit.

4. Thermal Resistance: K factor 2.82 in accordance with ASTM C177. R Value is .620 based on a 1.75” thick sample; Average thickness may vary depending on the veneer product selected; R-value will vary accordingly.

5. Fire Hazard Test on 1.75" Thick Sample: Flame Spread of 0, Smoke Development of 0 in accordance with UL 723; product shall be termed as noncombustible.

6. Freeze/Thaw: Conform to ASTM C67: 50 cycles; no disintegration and less than 3 percent weight loss.

G. Source Quality: Obtain all simulated stone and accessory materials from a single manufacturer.

1.07 DELIVERY, STORAGE AND HANDLING:

A. General: Comply with Division 1 Product Requirements Sections.

B. Ordering: Comply with the manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

D. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Store mortar and other moisture-sensitive materials in protected enclosures; handle by methods which will avoid exposure to moisture.

1.08 PROJECT CONDITIONS

A. Environmental Requirements/Conditions: Provide the manufacturer's recommended environmental requirements and conditions for installation. **Ambient air temperature shall be in accordance with manufacturers requirements:**

1. **Maintain materials and surrounding air temperature to minimum 40°F (4°C) prior to, during. and for 48 hours after completion of work.**

2. Protect materials from rain, moisture, and freezing temperatures prior to, during, and for 48 hours after completion of work.

3. Allow no construction activity on opposite side of wall during installation, and for 48 hours after completion of work.

1.09 WARRANTY

A. Project Warranty: Refer to Section 01700 for required Contractor's Guarantee, which must be submitted as a part of project close-out.

B. Manufacturer's Warranty: Submit, for the Owner's acceptance, manufacturer's standard warranty document executed by an authorized company official. The manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

C. The product specified in this section shall carry a full warranty coverage for a period of 30 years from the Architect-authorized Date of Substantial Completion. In addition, provide the manufacturer's standard limited warranty against defects in manufacturing for a period of 30 years from the Architect-authorized Date of Substantial Completion.

1.10 MAINTENANCE

A. Extra Materials: Furnish extra manufactured stone material in a variety of shapes and sizes in a quantity equal to five (5) percent of the installed stone. Upon delivery, coordinate

location for storage with the Owner's Representative.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. For purposes of this specification and to establish a minimum standard of quality and performance, the design is based on the use of the *Cultured Stone* simulated stone masonry system, as manufactured by *Boral Stone Products, LLC*, a division of *Owens Corning*, One Owens Corning Parkway, Toledo, OH 43659; ph. (800) 255-1727; fax: (419) 325-3995; website: www.culturedstone.com. Such references shall be construed only as establishing the quality of materials and workmanship to be used under this section, as shall not, in any way, be construed as limiting competition. Products used shall be those upon which the design is based, or shall be equal products approved in advance by the Architect. Requests for substitutions will be considered in accordance with provisions of the General Conditions. All permitted equals must be approved in writing by the Architect. All applications for substitution must include samples and technical data.

B. Similar Manufacturers: Similar manufactured stone veneer manufacturers include, but are not limited to, the following firms:

1. *LB Stone, Inc.* – P.O. Box 276, 167 Maple Street, Apple Creek, Ohio, 44606 ph. (330) 698-3931, fax (330) 698-4432.

2. *Artistic Stone Products of Texas* – 1023 Budde Road, Woodlands, Texas, 77386 ph. (936) 321-8098, fax (409) 273-0418.

3. *Crown Hill Stone, Inc.* – 59 Franklin Street, Westfield, New York 14787-1037 ph. (800) 295-1120, fax (716) 326-4601.

C. Simulated stone specified within this section is intended for interior or exterior use as a lightweight veneer facing on masonry, metal framed, or wood framed construction for architectural aesthetics.

D. All products shall be created by master craftsman who select the best textures, sizes and shapes from natural stones. These products shall be suitable for use on residential and commercial projects. The simulated stone products shall be produced in pre-selected sizes and shapes.

E. Simulated stone shall not be assumed to add to the load bearing capacity of a wall. Simulated stone products shall be cast in molds, using a process that replicates existing colors and textures with detail. Each color and texture shall have its own blend of ingredients including portland cement, lightweight aggregates and iron oxide pigments, producing the look and feel of natural stone.

F. Simulated stone shall not be used below water level, as in swimming

pool liners, as discoloring may result. Install a minimum of 4” (100 mm) above grade.

G. Simulated stone shall not be used in areas vulnerable to slush formed by chemicals used to melt ice or snow.

H. Hearthstones shall not be used for exterior use or as a surface area subject to traffic.

I. Sizes and Shapes: Sizes and shapes shall be as selected by the Architect from the manufacturer’s entire series of styles and shapes. The average thickness of manufactured stone wall veneers shall be 1-3/4” (45 mm); thickness may vary from 1” (25.4 mm) to 3-1/2” (90 mm), depending on the texture.

J. Colors and Textures: Provide complete palette of the manufacturer’s colors, ranges, textures and styles for selection by the Architect. The manufacturer shall supply compatible and complementary accessories series, such as quoins, cap stones, water table/sills, keystones, lintel stones, window and door trim units, and pavers, as requested by the Architect to complement and complete the field of simulated stone mounted at runs of wall area.

K. For bidding purposes, the “Yosemite from Provia”, and “Aspen Country” Series (or their current equivalents) shall be utilized, unless otherwise indicated on the drawings. T*his shall not limit the Architect from selecting from any of the entire series line, post-bid*. All alternate manufacturer’s must supply identical colors and patterns to those referenced herein, as a part of the base bid costs submitted.

L. All simulated stone wall veneers shall be made from non-combustible materials, and shall be listed by Underwriter’s Laboratories, Inc. (UL Listing #209T) for use as floor protectors and wall shields with stoves and on fireplace hearths (where applicable). Mortar joints must not exceed 1/2" (12.7 mm) in width. Where applicable, the mortar must be even with the top of the hearth surface.

M. Accessories: Provide water table/sill and coping stones to match the veneer style and color where called for on the drawings.

2.02 RELATED MATERIALS

A. Related Materials: Refer to other sections listed in Related Sections specified herein for related materials.

B. Mortar Components: Provide one of the following, as detailed on the drawings:

1. Premixed: Type N or Type S mortar, complying with ASTM C270.

a. Mortar mixed as per Table #2 on page #3.

b. Mortar Color: Iron Oxide color, meeting ASTM C 979 (if desired)

c. Water: Potable water meeting ASTM C 1602/1602M.

2. Premixed, Polymer Modified meeting ANSI 118.4 and compatible with Adhered Lightweight Concrete Masonry Veneer:

   a. Mortar mixed: Strictly per mortar manufacturer's instructions to ensure compliance with ANSI 118.4.

   b. Water: Potable water meeting ASTM C 1602/1602M.

   c. Mortar Color: Iron Oxide color meeting ASTM C 979 (if specified)

3. Polymer Modifiers / Bonding Agents:

   a. Polymer modifiers and/or bonding agents must comply with ASTM C 270, ASTM C 1059, ASTM C 1384 or CSA 179.

   b. Polymer modifiers and/or bonding agents must be used in strict accordance with the manufacturer's instructions for Adhered Lightweight Concrete Masonry Veneer and must satisfy the sheer bond requirements of ANSI 118.4.

   c. Polymer bonding agents must accommodate re-wetting to avoid potential bond compromise.

4. Field-Mixed Mortar: All field-prepared mortars shall be pre-approved in writing by the manufactured stone manufacturer/supplier, in advance of submission to the Architect. The following criteria must be achieved/utilized:

   a. Portland Cement – ASTM C150, Type I or masonry cement (Type N); ASTM C 91.

   b. Masonry sand.

   c. Lime: ASTM C207.

   d. Iron oxide pigments.

C. Water Resistive Barrier: Barrier shall meet the requirements of ICC Acceptance Criteria 38, "*Acceptance Criteria for Water Resistive Barriers*". **Water resistive barriers must be used on all applications, whether interior or exterior, unless the application is over masonry or concrete where a barrier is not required.**

1. When installing manufactured stone veneer in an exterior application requiring a water resistive barrier, two separate layers of the barrier shall be used. Each layer of water resistive barrier shall meet the requirements for Water Resistive Barrier (Grade D – water-vapor permeable) as defined by ICC Acceptance Criteria C-38, or ASTM E 2556/E 25556M. Installation of the water resistive barrier shall follow the

instructions provided by specific manufacturer. When installing manufactured stone veneer in an interior application, a single layer of water resistive barrier is recommended.

Water-resistive barrier products meeting ICC Acceptable Criteria 38 include, but are not limited to: *Weathermate Plus Housewrap* by *Dow Chemical Company*, Midland, MI; *Tyvek* by *DuPont*, Wilmington, DE; *Model #SC5016 Sure Cavity Rainscreen* by *MTI*; *WrapShield* by *VaproShield*, USA, Gig Harbor, WA. Such references shall be construed only as establishing the quality of materials and workmanship to be used under this section, as shall not, in any way, be construed as limiting competition. Products used shall be those upon which the design is based, or shall be equal products approved in advance by the Architect. Other manufacturers products will be considered, provided that the simulated stone manufacturer deems the product compatible with the system (in writing), and the substituted product meets IBC and IRC building code requirements for weather-resistive barriers, in conformance with ICC (Acceptance Criteria) AC-38. Provide written conformance from manufacturer to Architect as a part of the submittal process.

D. Flashing: To maintain the weather-resistance of the exterior wall on which the stone products are to be installed, corrosion-resistant flashing, weep screed and a means of drainage shall be installed at all penetrations and terminations of the stone cladding.

1. Flashing type and locations shall be as detailed on the contract drawings, and shall be in accordance with the requirements of all applicable building codes.

2. For additional recommendations regarding flashing, refer to the following trade associations, standards, organizations and resources:

   a. ASTM E 2112;
   b. Asphalt Roofing Manufacturers Association (ARMA);
   c. Brick Institute of America (BIA);
   d. The American Plywood Association (APA);
   e. Local building department;
   f. Architect / Engineer;
   g. Masonry Veneer Manufacturers Association (MVMA) installation guide for adhered concrete masonry veneer, available at: www.masonryveneer.org.

E. Metal Lath:

1. Provide minimum 2.5 lb. galvanized self-furring expanded metal lath (diamond mesh) meeting the requirements of ASTM C 847, or min. 18-gauge galvanized self-furring woven wire mesh, meeting the requirements of ASTM C 1032.

2. For metal buildings and open stud construction, provide a

minimum 3.4-lb., 3/8" rib, paper-backed, expanded galvanized metal lath), meeting the requirements of ASTM C 847, with installation complying with ASTM C 1063 (for exteriors) and ASTM C 841 (for interiors). Asphalt paper-backed breather sheet shall meet the requirements of Federal Specification UUB790A, Type 1, Grade-D, Style 2.

F. Fasteners: Provide one of the following, based on substrate:

1. Into Wood Studs: Provide minimum 1/8 inch shank diameter galvanized nails or minimum ¾ inch crown staples of sufficient length to penetrate 1 inch minimum into the stud.

2. Into Metal Studs: Provide minimum 7/16 inch head diameter, corrosion-resistant, self-drilling, self-tapping pancake-head screws of sufficient length to penetrate 3/8 inch minimum into the stud.

G. Weep Screed: Provide weep screeds as required for installation over framed construction.

2.03 MORTAR MIXES

A. Mixing: Mix materials in accordance with manufacturer's instructions, including product data and product technical bulletins. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C 270, Type N or S. Do not use anti-freeze compounds to lower the freezing point of mortar.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.

3.02 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions. Coordinate required repairs as necessary to correct unsatisfactory conditions. Manufacturer's representative shall sign-off on the existing substrate conditions prior to commencement of the work.

B. Commencement of the work by the Installing Contractor represents acceptance of the substrate conditions.

3.03 PREPARATION

A. Surface Preparation: Follow the manufacturer's instructions designated below for the appropriate type of manufactured masonry and substrate:

1. General: Prevent work from occurring on the opposite of walls to which manufactured masonry is applied during and for 48 hours following installation of the manufactured masonry.

2. Open Stud: Install paperbacked metal lath (conforming to 2.02.E.2 requirements) to studs using galvanized nails or staples which penetrate a minimum of 1" and 4" on center. Apply 1/2" to 3/4" scratch coat and allow to dry 48 hours. Wrap weather resistant barrier (conforming to 2.02C above) and metal lath (conforming to 2.02E above) a minimum of 16" around all outside and inside corners.

3. Sheathed Surfaces: Install one layer of weather-resistant barrier with lap joints 4" shingle fashion. Apply code approved metal lath. Attach with galvanized nails or staples which penetrate a minimum of 1". Apply fasteners 6" on center vertically and 16" on centers horizontally. Wrap weather resistant barrier and metal lath a minimum of 16" around all outside and inside corners.

4. Concrete and Masonry Surfaces, New, Clean and Untreated: No preparation needed. Examine newly poured concrete closely to ensure that its finished surface contains no releasing agents (form oil). If it does contain form oil, etch surface with muriatic acid, rinse thoroughly and/or score with a wire brush, or use high pressure water or sandblasting to remove.

4. Existing Concrete and Masonry Surfaces: If required by simulated stone manufacturer, remove all existing paint, coatings, sealers, and dirt. Apply metal lath to surfaces, attach with galvanized concrete nails which penetrate a minimum of 1". Apply 6" apart, 16" on centers.

5. Prior to product installation, the installing contractor shall spread out simulated stone products at the job site, so a good variety of sizes, shapes and colors can be chosen from, prior to installation. For maximum effect, some variety and contrast is required of this veneer system, and should be planned for in advance, by the Installing Contractor. (The use of small stones next to larger ones, heavy-textured pieces next to smooth, and thick stones next to thinner ones will help to achieve this goal.)

6. Mixing manufactured stone products from different boxes during application will allow a desirable balance of individual stones on the finished project.

7. The option of tinting the installation mortar complements the color of the stone being installed, and will enhance

the appearance of the finished installation. This option will be given to the Architect, at no additional cost to contract. Note: Regular mortars can be tinted to complement simulated stone products using iron oxide pigments.

3.04 SIMULATED STONE INSTALLATION

A. Pre-Installation Notes: If stone is being applied in hot or dry weather, the back of each piece should be moistened with a fine spray of water or a wet brush to adequately prevent excessive absorption of moisture from the mortar. If being installed over concrete, masonry or scratch coat substrate, the substrate surface area should also be dampened before applying mortar. Applications should be protected from freezing as mortar will not set up properly under such conditions. Do not use antifreeze compounds to lower the freezing point of mortar.

B. Exterior Applications: On exterior applications, the incorrect installation or absence of flashing, cant strips, gutters and downspouts in adjacent construction may result in diversion of water run-off onto finished surface areas. Masonry and other building products subjected to these conditions may develop staining, and when combined with severe freeze-thaw conditions, may eventually cause surface damage. The General Contractor is fully responsible to supply all necessary masonry flashing and drainage in adjacent construction for the express intent of remediating water run-off from finish surfaced areas, prior to the application of the simulated stone veneers. All veneers shall be installed a minimum of 4” above grade.

C. Apply mortar and stone, working from the bottom up, or from the top down. Working from the top down may help avoid splashing previously applied stone with dripping mortar. (*Ledgestone* Series types should be installed from the bottom up.) Using a trowel, apply mortar 1/2" to 3/4" thick to prepared surface area (lath, dampened masonry, or concrete surfaces), covering a maximum of 10 square feet at one time. Do not spread more than a workable area (5 - 10 sq ft) so that mortar will not "set up" before stone is applied.

D. Setting Units: Press each stone into the mortar setting bed firmly enough to squeeze some mortar out around the stone's edges. Apply pressure to the stone to ensure a good bond. Ensure complete coverage between the mortar bed and back surface of the stone. Mortar may also be applied to the entire back of the stone.

1. Where applicable, install hearth pieces in a full 1/2" to 3/4" deep mortar setting bed.

E. Joints: Place units with uniform mortar joints. In order to obtain the most natural look, stone joints should be as narrow as possible, and shall not exceed 1/2" in width on average. When installing "pre-fitted" stone textures, units should be fitted tight against each other with no allowance for mortar joints.

Install outside corner return units with short and long lengths alternated.

1. Remove excess mortar; do not allow mortar to set up on face of units, Point, rake and tool joints before mortar has set. Clean and finish joints in accordance with manufacturer's instructions.

F. Cutting: Perform necessary cutting with proper tools to provide uniform edges; take care to prevent breaking unit corners or edges. Broken units will be rejected by the Architect, and the General Contractor shall be fully responsible for complete removal and replacement of same.

G. Related Products Installation: Refer to other sections listed under 1.02 of this section for related materials installation.

3.05 FIELD QUALITY REQUIREMENTS

A. Manufacturer's Field Services: Under the Base Bid, the General Contractor shall arrange and supply manufacturer's field services during construction, which shall consist of product use recommendations and periodic site visit for inspection and approval of product installation in accordance with manufacturer's instructions.

1. Site Visits: The contractor shall arrange for an appropriate amount of site visits by the manufacturer’s field representative, based on the size of the project. At a bare minimum, for projects totaling less than 1,000 sf of installed product, an initial visit shall be made to verify that all conditions are acceptable prior to the start of the installations. The field representative shall then visit the site as necessary, to assess and guide the installations of the manufactured stone veneer system. All visits shall be covered under the base bid submitted; no additional charges will be entertained by the Owner post-bid.

2. The manufacturer’s field representative shall not enter the job site without first checking in with the on-site Construction Manager (where applicable), who will require a sign-in by the representative to verify attendance on-site. The manufacturer’s field representative shall file a post-inspection progress report to both the Architect and Construction Manager to specifically comment on the areas of installation, including quality of workmanship, potential problems, substrate conditions and other recommendations as necessary. The General Contractor shall be required to conduct any and all repairs or modifications necessary for a complete and proper installation.

3.06 CLEANING

A. Cleaning: Remove temporary coverings and protection of adjacent

work areas. Remove construction debris from project site and legally dispose of debris.

1. Cleaning: Use a strong solution of granulated soap or detergent and water with a bristle brush. Do not use a wire brush, as it will cause damage to the surface. Rinse immediately with fresh water. Do not attempt to clean using acid or acid based products. *Do not clean with high pressure power washers.*

2. Salt and De-icing Chemicals: During the project, the Contractor shall not use de-icing chemicals on areas immediately adjacent to a simulated stone veneer application. Upon final completion, this becomes the Owner's responsibility.

3. Scuffing: Remove all scuff marks by cleaning as specified herein.

4. Efflorescence: The Contractor is responsible for the removal of efflorescence should it appear during the work or within the guarantee period. To remove efflorescence, allow the stone to dry thoroughly, then scrub vigorously with a stiff bristle brush and clean water. Rinse thoroughly. Do not use a wire brush. For difficult efflorescence problems, scrub thoroughly with a solution of 1 part white household vinegar to 5 parts clean water. Rinse thoroughly.

3.07 PROTECTION

A. Protection: Protect all finished work from rain during and for 48 hours following the installation. Protect all finished work from damage during the remainder of the construction period.

B. Any surfaces damaged during the construction period shall be repaired or replaced, as directed by the Architect, at no additional cost to the Owner.

END OF SECTION

DIVISION 4 - MASONRY

SECTION 04720 – ARCHITECTURAL CAST STONE

PART 1 - GENERAL

1.01 SCOPE:

A. This Section includes the following:

1. Manufactured cast stone veneer at exterior walls.
2. Manufactured cast stone date stone.
3. Manufactured cast stone coping, cornices, sills and lintel components, etc.
4. Reinforcement, and accessories
5. Mortar and joint pointing.

B. All labor, materials, and equipment to provide the cast stone shown on the architectural drawings and as described in this specification.

C. Manufacturer shall furnish and deliver cast stone covered by this specification.

D. Setting contractor shall unload, store, furnish all anchors, and set cast stone.

1.02 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Related Sections include, but not limited to, the following:

1. Section 04200 – Unit Masonry
2. Section 05500 – Metal Fabrication
3. Section 06702 - Flashing
4. Section 07900 – Caulking
5. Section 07910 – Joint Sealers

1.03 QUALITY ASSURANCE:

A. Manufacturer: Must have ten (10) years minimum continuous operating experience and have facilities for manufacturing cast stone as described herein.

B. Reference Standards: Comply with applicable provisions and recommendation of the following, except as otherwise shown or specified.

1. Cast Stone Institute Standard Specifications.
2. ASTM C 33 - Specification for Concrete Aggregates.
3. ASTM C 150 - Specification for Portland Cement.

4. ASTM C 270 - Specification for Mortar for Unit Masonry.
5. ASTM C 494C/M - Specification for Chemical Admixtures for Concrete.

6. ASTM A 615A/M - Specification for Deformed and Plain Billet-Steel Bars for Reinforced Concrete.
7. ASTM C 979 - Specification for Coloring Pigments for Integrally Pigmented Concrete.
8. ASTM C 1116 – Specification for Fiber Reinforced Concrete and Shotcrete.
9. ASTM C 1194 - Test Method for Compressive Strength of Cast Stone.
10. ASTM C 1195 - Test Method for Absorption of Cast Stone.
11. ASTM C 1364 – Standard Specification for Cast Stone.
12. Cast Stone Institute Technical Manual (Current Edition)

C. Pre-Installation Conference: Immediately prior to any cast stone application, a pre-installation meeting shall be held at the job site. The meeting shall be arranged by the General Contractor and attended by the Cast Stone Manufacturer's Technical Representative, Cast Stone Installer, General Contractor, Owner, Architect and Construction Manager (where applicable). The purpose of this meeting is to discuss specific expectations and responsibilities, construction procedures, specified requirements, and application procedures.

D. Manufacturer's Representation: Prior to installation, the General Contractor shall arrange for the manufacturer's technical representative to demonstrate proper installation and finishing procedures for each type and component of stone to be placed.

E. Manufacturer's Qualifications: A Cast Stone Institute Certified Producer, with a minimum of ten (10) years experience in producing cast stone of the types required for project. Plant shall have adequate capacity to furnish quality, shapes, sizes and quantity of cast stone required in accordance with the project schedule. Manufacturer shall submit a written list of projects similar in scope and at least three (3) years of age, along with owner, architect and contractor references.

F. Manufacturing Standards: Comply with the requirements of the Cast Stone Institute Technical Manual and the project specifications. Where a conflict may occur, the Contract Documents shall prevail.

G. Installer's Qualifications: Company specializing in the installation of cast stone products, with minimum of five (5) years of successful experience in handling and installing cast stone units on projects of comparable size and scope.

H. Certifications: Provide manufacturer's standard certificates of compliance with Cast Stone Institute standards.

1.04 PRODUCT DESCRIPTION:

A. General: A refined architectural concrete building unit manufactured to simulate natural cut stone, used in Division 4 masonry applications. Cast stone unit colors, textures, and shapes shall conform to those indicated on the drawings and described in this specification.

B. Design Requirements: Cast stone units and their anchorage shall be designed to withstand dead and live loads, lateral loads, applicable snow load and other loads calculated in accordance with governing code of the area where project occurs. Design requirements shall be indicated on manufacturers shop drawings.

C. Provide special shapes and configurations indicated on the drawings.

1.05 SUBMITTALS:

A. All submissions shall be made in accordance with Section 01300 Submissions.

B. Submit for approval the following:

1. Submit 12”x12” pieces of the cast stone that are representative of the general range of finish and color to match existing cast stone or proposed to be furnished for the project.

2. Test Reports: Submit manufacturers test results of cast stone components previously made by the manufacturer using materials from same sources proposed for use in project.

3. Product Data: Submit manufacturer's standard product literature for stone, accessories, sealant and cleaner.

4. Shop Drawings: Prior to fabrication and delivery, submit manufacturers shop drawings clearly indicating:

a. Profiles, cross sections, reinforcement, exposed faces, arrangement of joints, anchoring methods, anchors, annotation of components and their locations in project as indicated on layout drawings.

b. Unless otherwise shown on the contract drawings:

1. Provide suitable wash on all exterior sills, coping, projecting courses, and pieces with exposed top surfaces.
2. Provide drips as needed.
3. Provide casting of sleeves to accommodate required penetrations and grout solid after installation.

5. Warranty Period: Provide manufacturer written warranty against deterioration or developing surface defects that would detract from its appearance for a minimum period of ten (10) years from

date of manufacture.

C. The cast stone manufacturer shall be responsible for all calculations, engineering and detailing of anchor methods/supports and reinforcing. Shop drawings shall bear the seal and signature of N.Y.S. P.E.

1.06 QUALITY ASSURANCE:

A. Standards: Unless otherwise specified in this section, cast stone shall comply with the following:

1. ASTM C 1364.
2. Cast Stone Institute Standard Specification (latest edition).

B. Mock-Up: Provide full size cast stone components for installation in mock-up of exterior wall. Approved mock-ups will become standard for appearance and workmanship.

1. Construct cast stone mock-up wall panel, of size appropriate to include stone attachment, accessories, flashings, corner condition, and typical jointing.
2. Locate where directed. Maintain and protect approved sample wall panel for duration of the work. Completed work shall match approved sample panel.
3. If mock-up is disapproved, provide new mock-up. Repeat procedure until mock-up is approved.
4. Remove mock-up only by direction of the Architect. Removal shall be complete, with all materials disposed off-site and the site restored.

C. Job Site Testing – One sample from production units may be selected at random from the field for each 500 cubic feet delivered to the job site.

1. Three field cut cube specimens from each of these samples shall have an average minimum compressive strength of not less than 85% with no single specimen testing less than 75% of design strength as allowed by ACI 318.
2. Three field cut cube specimens from each of these samples shall have an average maximum cold-water absorption of 6%.
3. Field specimens shall be tested in accordance with ASTM C 1194 and C 1195

1.07 DELIVERY, STORAGE, AND HANDLING:

A. Delivery:
1. Deliver cast stone components secured to shipping pallets and protected from damage and discoloration.
2. Protect corners from damage.

3. Number each piece individually to match shop drawings and scheduled installation sequence.

B. Storage:
1. Store cast stone components and installation materials in accordance with manufacturers instructions.
2. Store cast components on pallets with nonstaining, waterproof covers.
3. Ventilate under covers to prevent condensation.
4. Prevent contact with dirt.

C. Handling:
1. Protect cast stone components during handling and installation to prevent chipping, cracking or other damage.

1.08 PROJECT CONDITIONS:

A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F(4 deg C) and above and will remain so until cast stone has dried, but not less than 7 days after completing cleaning.

B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1.09 SEQUENCING and SCHEDULING

A. Comply with manufacturer's recommendations and procedure recommended by the Cast Stone Institute. Describe special sequences and procedures when units must be set in sequence to attain desired appearance or structural integrity such as loading limits, shoring/supports or similar requirements.

B. Schedule and coordinate production and delivery of cast stone components with unit masonry work to optimize on-site inventory and to avoid delay in work.

PART 2 - PRODUCTS

2.01 CAST STONE MATERIALS:

A. Physical Properties - Provide the following complying with ASTM C 1364:

1. Compressive Strength, ASTM C 1194: 6,500 psi minimum for

products at 28 days.
2. Absorption, ASTM C 1195: 6% maximum by cold water method or 10% maximum by the boiling method for products at 28 days.
3. Air Content, ASTM C 173 or C 231: Air entrainment is not required for VDT products.
4. Freeze-Thaw, ASTM C 1364: The CPWL shall be less than 5% after 300 cycles of freezing and thawing.
5. Linear Shrinkage, ASTM C 426: Shrinkage shall not exceed 0.065%

B. Raw Materials:

1. Portland Cement - Type I or Type III, white and/or gray as required to match specified color, ASTM C 150
2. Coarse Aggregates - Granite, quartz, or limestone, ASTM C 33, except form gradation, and are optional for the VDT casting method.
3. Fine Aggregates - Natural or manufactured sands, ASTM C 33, except for gradation
4. Coloring Pigments - Inorganic iron oxides pigments, ASTM C 979 except that carbon black pigments shall not be used.
5. Chemical Admixtures: ASTM C 1364.
6. Water: Potable.
7. Reinforcement – Where required, ASTM A 615 (grade 40 epoxy coated)
8. Fiber Reinforcement – Fibrous nylon, ASTM C 1164
9. All anchors, dowels and other anchor devices and shims shall be standard building stone anchors commercially available in non-corrosive materials such as stainless steel, Type 304.

2.02 MANUFACTURERS

A. Continental Cast Stone. 400 Cooper Road, West Berlin NJ 08091. Phone: 856-753-8700 and Estimating Fax: 856-753-8711

B. Corinthian Cast Stone Corp. 115 Wyandanch Ave, Wyandanch NY 11798. Phone: 631-776-7100 and Fax: 631-776-7101

C. Approved equal by Architect

2.03 ACCESSORIES

A. Clips, Plates and Miscellaneous Anchors: ASTM A167, Type 304 stainless steel for items in direct contact with cast stone, unless specifically indicated otherwise.

1. Anchoring Veneer to Miscellaneous Substrates: Stainless steel angles and split-tail anchors.
2. Anchors for Concrete or Concrete Masonry Backup: Stainless Steel with expansion shields.
3. Corners: Stainless Steel cramp anchors for anchoring stones together.

B. Dowels: 1/2-inch diameter, 5 inches long, ASTM A167, Type 304 stainless steel. Provide minimum two dowels per stone or as

appropriate to size and configuration of units.

C. Setting Buttons, Shims, and Sheet: Resilient plastic, non-staining, thickness to suit joint thickness and bed depths. For pointed joints, sized to avoid interference with pointing operation.

D. Anchors: ASTM A167, Type 304 stainless steel, sized for conditions, configuration as indicated, with additional attachment devices if recommended by cast stone manufacturer.

1. Anchor Bolts, Nuts and Washers: Type 304 stainless steel dowels.
2. Steel Plates, Shapes and Bars: Type 304 stainless steel.

E. Other Fasteners: Shelf angles and other structural supports shall be galvanized after fabrication in accordance with ASTM A123.

F. Weeps: As furnished or recommended by cast stone manufacturer.

G. Sealants: Vulkem 116, One-part, moisture curing, gun-grade polyurethane sealant.

2.04 FABRICATION

A. Method: Dry Cast; Manufactured from zero slump concrete

1. Vibrant Dry Tamp (VDT) cast method: Vibratory ramming of earth moist, zero-slump concrete against a rigid mold until it is densely compacted.
2. Machine casting method: Manufactured from earth moist, zero-slump concrete compacted by machinery using vibration and pressure against a mold until it becomes densely consolidated.

B. Shapes: Unless otherwise indicated on drawings, provide.

1. Suitable wash on exterior sills, copings, projecting courses and components with exposed top surfaces.
2. Drips on projecting components.

C. Reinforcement:

1. Reinforce the units for safe handling and structural stress.
2. Minimum reinforcing shall be 0.25 percent of the cross section area.
3. Reinforcement shall be non-corrosive where faces exposed to weather are covered with less than 1.5 in. of concrete material. All reinforcement shall have minimum coverage of twice the diameter of the bars.
4. Panels, soffits and similar stones greater than 24 in. in one direction shall be reinforced in that direction. Units less than 24 in. in both their length and width dimension shall be non-reinforced unless otherwise specified.

5. Welded wire fabric reinforcing shall not be used in dry cast products.

D. Curing:

1. Cure cast stone components with a direct-fired steam generator at a minimum temperature of 105 degrees F for a minimum of six (6) hours, within twelve (12) hours of fabrication.
2. Cure cast stone components in presence of carbon monoxide and carbon dioxide to promote carbonation at surface, to minimize efflorescence.

E. Color and Finishing:

1. Color shall be as selected from the entire available color palette from the manufacturer. If custom colors are required, they shall be supplied at the differential cost increase over the standard palette of colors.
2. Mortar color shall match stone unless otherwise indicated.
3. All surfaces intended to be exposed to view shall have a fine-grained texture similar to natural stone, with no air voids in excess of 1/32 in. and the density of such voids shall be less than three (3) occurrences per any one square inch and not obvious under direct daylight illumination at a five (5) foot distance.
4. Units shall exhibit a texture approximately equal to the approved sample when viewed under direct daylight illumination at a ten (10) foot distance.
5. Remove blemishes from exposed surfaces before packaging for shipment.

F. Manufacturing Tolerances:

1. Cross section dimensions shall not deviate by more than 1/8” from approved dimensions.
2. Length of units shall not deviate by more than length/360 or 1/8”, whichever is greater not to exceed 1/4". Maximum length of any unit shall not exceed 15 times the average thickness of such unit unless otherwise agreed by the manufacturer.
3. Warp, bow or twist of units shall not exceed length/360 or 1/8”, whichever is greater.
4. Location of dowel holes, anchor slots, flashing grooves, false joints and similar features – On formed sides of unit, 1/8”, on unformed sides of unit, 3/8” maximum deviation.

2.05 DATE STONE

A. Letters and numerals in date stone shall be incised by casting or sandblasting to ½-inch depth from approved full-sized layouts of lettering. Letter and numeric style shall be as specified by Architect.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions to receive cast stone components, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of cast stone.

B. Proceed with installations only after unsatisfactory setting conditions have been corrected. Commencement of work constitutes acceptance of existing field conditions.

3.02 INSTALLATION

A. Setting:

1. Drench cast stone components with clear, running water immediately before installation.
2. Do not use pry bars or other equipment in a manner that could damage cast stone components
3. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.
4. Set cast stone components in a full bed of mortar, unless otherwise indicated on the drawings.
5. Fill vertical joints with mortar.
6. Mortar Type N, ASTM C 270. All joints shall be 3/8 in. unless otherwise indicated on drawings.
7. Leave head joints in copings and similar components with horizontal raked joints for sealant.
8. Rake mortar joints 3/4 in. for pointing.
9. Sponge face of each stone to remove excess mortar immediately after setting.
10. Tool joints to a slight concave profile
11. Install/set all cast stone components and accessories accurately, using skilled, experienced personnel, according to approved shop and setting drawings, and manufacturer’s printed installation instructions. Use stone-fitters to perform field cutting with power saws, when required. Do not install damaged cast units.
12. Provide chases, reveals, openings and other spaces required to accommodate other work. Close up after other work is complete with cast stone which matches stone already set.
13. Where an open cavity is indicated between cast stone / units and back-up material, keep cavity free of mortar and grout.
14. Install and adjust anchors, supports, fasteners and other attachments indicated or as necessary to secure the stones accurately in locations, with uniform joints, and with edges and faces aligned. Install all cast stonework with anchors, except where only masonry bond is indicated.
15. Install concealed flashing under all copings and at continuous

shelf angles, lintels, ledges and similar features.

16. Weepholes - Cavity Wall Construction: Install weepholes above flashing over window heads, relieving angles, through-wall flashing at bottom of wall cavity, etc. as may be shown on the drawings. Ensure weepholes and cavity area above flashing is free of mortar droppings.
17. Install all anchors, supports, fasteners, and other attachments indicated or necessary to secure stonework in place. Attach anchors securely to stone and to supporting surfaces. Place anchors and dowels firmly and fill all holes with mortar or non-shrink grout.

B. Sealant Joints:

1. Insert properly sized foam backing rod, and install Vulkem 116 sealant using gun.
2. Provide sealant joints at the following locations and as indicated on drawings: Cast stone components with exposed tops, joints at relieving angles and control/expansion joints.

C. Protect stone while on ground (and after setting) from splashing, mortar, and damage from other trades.

3.03 SETTING TOLERANCES

A. Tolerances shall comply with Cast Stone Institute Standard Specification (latest edition).

1. Variation from Plumb: Do not exceed 1/8 in. in five (5) feet or 1/4 in. in twenty (20) feet or more.
2. variation from Level: Do not exceed 1/8 in. in five (5) feet, 1/4 in. in twenty (20) feet, or 3/8 in. maximum.
3. Variation in Joint Width: Do not vary joint width more than 1/8 in. or 1/4 of normal joint width, whichever is greater.

4. Variation in Plane Between Adjacent Surfaces: Do not exceed 1/8 in. difference between planes of adjacent components or adjacent surfaces indicated to be flush with components.

3.04 SURFACE REPAIR

A. Repair chipping and other surface damage noticeable when viewed in direct daylight at ten (10) feet.

B. The repairing of cast stone chipped or damaged shall be performed only by mechanics skilled in this work, using matching touch-up materials furnished by the cast stone manufacturer and according to his direction. Stones that cannot be repaired with small patching shall be removed and replaced with new perfect stones at no additional cost to the owner for incurred labor or materials.

C. Repair methods and results to be as recommended by manufacturer approved by Architect.

3.05 FIELD QUALITY CONTROL

A. Inspection: Verify that on-going and completed cast stonework meets specified tolerance and appearance requirements. Remove and replace work that is broken, chipped, stained, or otherwise damaged; work that does not match approved samples or approved mock-up; and work containing defective joints. Inspect by Cast Stone Institute standards.

B. Replace unacceptable materials using methods and procedures approved by the cast stone manufacturer, which leaves no visible evidence of replacement.

C. Acceptable Appearance: Cast Stone shall show no obvious repairs or imperfections, other than minimal color variations, when viewed with the unaided eye at a 10’ distance in normal daylight conditions.

3.08 CLEANING and PROTECTION

A. Cleaning: Perform final cleaning as soon as possible after mortar has set and been tooled. Clean faces of stone/unit at pointed joints immediately. Clean stone by wetting with clear running water and applying a solution of "Sure Clean #600" by ProSoCo Products, Inc., or equal. Follow manufacturer's instructions. Remove soiled areas, streaks and stains from pre-finished components using clean water, mild soap, and soft bristle brush. After cleaning, rinse the cast stone/unit and adjacent materials thoroughly with clean water to remove the cleaning solution.

B. Do not use acid solutions, wire brushes, cleaning compounds with caustic or harsh fillers, or other materials or methods which could damage, discolor or etch surfaces or joints, without written approval from cast stone manufacturer.

C. Protection: Protect work from staining or damage to finished surfaces by on-going construction, until acceptance by the Owner.

END OF SECTION

DIVISION 5 - METALS

SECTION 05120 - STRUCTURAL STEEL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.02 SUMMARY

A. Extent of structural steel work is shown on drawings, including schedules, notes, and details to show size and location of members, typical connections, and type of steel required.

B. Structural steel is that work defined in American Institute of Steel Construction (AISC) "Code of Standard Practice" and as otherwise shown on drawings.

C. Miscellaneous metal fabrications are specified elsewhere in Division 5. Refer to Division 3 for anchor bolt installation in concrete; Division 4 for masonry.

D. Source Quality Control: Materials and fabrication procedures are subject to inspection and tests in mill, shop, and field, conducted by a qualified inspection agency. Such inspections and test will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.

1. Promptly remove and replace materials or fabricated components which do not comply.

E. Design of Members and Connections: Details shown are typical; similar details apply to similar conditions, unless otherwise indicated. Verify dimensions at site whenever possible without causing delay in the work. Contractor shall retain the services of a licensed professional engineer for the design of any connections not shown on the drawings.

1. Promptly notify Architect whenever design of members and connections for any portion of structure are not clearly indicated.

1.03 SUBMISSIONS

A. Product Data: Submit producer's or manufacturer's specifications and installation instructions for the following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).

1. Structural steel (each type), including certified copies of mill

reports covering chemical and physical properties.

2. High-strength bolts (each type), including nuts and washers.

3. Structural steel primer paint.

4. Shrink-resistant grout.

B. Shop Drawings: Submit shop drawings prepared under the supervision of a registered professional engineer, including complete details and schedules for fabrication and assembly of structural steel members, procedures, and diagrams.

1. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS A2.1 and A2.4 symbols, and show size, length, and type of each weld.

2. Provide setting drawings, templates, and directions, for installation of anchor bolts and other anchorages to be installed as work of other sections.

C. Test Reports: Submit copies of reports of tests conducted on shop and field bolted and welded connections. Include data on type(s) of tests conducted and test results.

D. Surveys: Submit certified copies of each survey conducted by a registered professional engineer or land surveyor, showing elevations and locations of base plates and anchor bolts to receive structural steel, and final elevations and locations for major members. Indicate discrepancies between actual installation and contract documents.

1.04 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of following, except as otherwise indicated:

1. AISC 'Code of Standard Practice for Steel Buildings and Bridges.'

2. Paragraph 4.2.1 of the above code is hereby modified by deletion of the following sentence: "This approval constitutes the owner's acceptance of all responsibility for the design adequacy of any connections designed by the fabricator as a part of his preparation of these shop drawings."

3. AISC "Specifications for the Design, Fabrications, and Erection of Structural Steel for Buildings," including "Commentary" and Supplements thereto as issued.

4. AISC "Specifications for Architecturally Exposed Structural Steel."

5. AISC "Specifications for Structural Joints using ASTM A325 or A490 Bolts" approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation.

6. American Welding Society (AWS) D1.1 "Structural Welding Code - Steel."

7. ASTM A6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use."

B. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure."

1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.

2. If recertification of welders is required, retesting will be Contractor's responsibility.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site at such intervals to insure uninterrupted progress of work.

B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time to not delay work.

C. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion or deterioration.

1. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Metal Surfaces, General: For fabrications of work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, rust and scale, seam marks, roller marks, rolled trade names, and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating, and application of surface finishes.

B. Structural Steel Shapes, Plates, and Bars: ASTM A992/A572-50.

C. Cold-Formed Steel Tubing: ASTM A500, Grade B.

D. Hot-Formed Steel Tubing: ASTM A501.

E. Steel Pipe: ASTM A53, Type E or S, Grade B; or ASTM A501.

1. Finish: Black, except where indicated to be galvanized.

F. Steel Castings: ASTM A27, Grade 65-35, medium-strength carbon steel.

G. Headed Stud-Type Shear Connectors: ASTM A108, Grade 1015 or 1020, cold finished carbon steel; with dimensions complying with AISC Specifications.

H. Anchor Bolts: ASTM A307, non-headed type unless otherwise indicated.

I. Unfinished Threaded Fasteners: ASTM A307, Grade A, regular low-carbon steel bolts and nuts.

1. Provide either hexagonal or square, head and nuts, except use only hexagonal units for exposed connections.

J. High-Strength Threaded Fasteners: Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers, as follows:

1. Quenched and tempered medium-carbon steel bolts, nuts, and washers, complying with ASTM A325.

2. Quenched and tempered alloy steel bolts, nuts, and washers, complying with ASTM A490.

a. Direct tension indicator washers may be used at Contractor's option.

K. Electrodes for Welding: Comply with AWS Code.

L. Structural Steel Primer Paint: 10-1009 Gray Metal Primer by Tnemec Co., Inc.

M. Loose and Hung Lintel Steel Primer Paint: 50-330 Poly-Ura-Prime by Tnemec Co., Inc.

1. Lintel angles for exterior veneer, either loose or hung, shall be hot dip galvanized. Final painting shall be after installation, but prior to installation of items in masonry openings.

N. Non-metallic Shrinkage-resistant Grout: Pre-mixed, non-metallic, non-corrosive, non-staining product containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing and water reducing agents, complying with CE-CRD-C621.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

a. Euco N.S.; Euclid Chemical Company.
b. Crystex; L & M Construction Chemicals.
c. Masterflow 713; Master Builders.
d. Five Star Grout; U.S. Grout Corporation.
e. Upcon; Upco Chemical Division, USM Corporation.
f. Propak; Protex Industries, Inc.
g. Set Non-Shrink; Set Products, Inc.

2.02 FABRICATION

A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members where indicated.

1. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.

2. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

B. Connections: Weld or bolt shop connections, as indicated. Bolt field connections, except where welded connections or other connections are indicated.

1. Provide high-strength threaded fasteners for principal bolted connections, except where unfinished bolts are indicated.

2. Provide unfinished threaded fasteners for only bolted connections of secondary framing members to primary members (including purlins, girts, and other framing members taking only nominal stresses) and for temporary bracing to facilitate erection.

C. High-Strength Bolted Construction: Install high-strength threaded fasteners in accordance with AISC "Specifications for Structural Joints using ASTM A325 or A490 Bolts".

D. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods which will produce true alignment of axes without warp.

E. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Shop weld shear connectors, spaced as shown, to beams and girders in composite construction. Use automatic end welding of headed stud shear connectors in accordance with manufacturer's printed instructions.

F. Holes for Other Work: Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as shown on final shop drawings.

1. Provide threaded nuts welded to framing, and other specialty items as indicated to receive other work.

2. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

G. Expansion Joints: Provide expansion joints in steel shelf angles when part of structural steel frame; locate at vertical brick expansion joints as indicated on drawings.

2.03 SHOP PAINTING

A. General: Shop paint structural steel, except those members or

portions of members to be embedded in concrete or mortar. Paint embedded steel which is partially exposed on exposed portions and initial 2" of embedded areas only.

1. Do not paint surfaces which are to be welded or high-strength bolted with friction-type connections.

2. Do not paint surfaces which are scheduled to receive sprayed-on fireproofing.

3. Apply 2 coats of paint to surfaces which are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

B. Surface Preparation: After inspection and before shipping, clean steel work to be painted. Remove loose rust, loose mill scale, and spatter, slag, or flux deposits. Clean steel in accordance with one of the approved Steel Structures Painting Council (SSPC) methods as follows:

1. SP-1 "Solvent Cleaning."

2. SP-2 "Hand Tool Cleaning."

3. SP-3 "Power Tool Cleaning."

4. SP-5 "White Metal Blast Cleaning."

5. SP-6 "Commercial Blast Cleaning."

6. SP-7 "Brush-Off Blast Cleaning."

7. SP-10 "Near-White Blast Cleaning."

C. Painting: Immediately after surface preparation, apply structural steel primer paint in accordance with manufacturer's instructions and at a rate to provide dry film thickness of not less than 1.5 mils. Use painting Paint System Guide No. 7.00.

D. Painting: Provide a one-coat shop applied paint system complying with Steel Structures Painting Council (SSPC), methods which result in full coverage of joints, corners, edges, and exposed surfaces.

PART 3 - EXECUTION

3.01 ERECTION

A. Surveys: Employ a registered professional engineer or land surveyor for accurate erection of structural steel. Check elevations of concrete and masonry bearing surfaces, and locations of anchor bolts and similar devices, before erection work proceeds, and report discrepancies to Architect. Do not proceed with erection until corrections have been made, or until compensating adjustments to

structural steel work have been agreed upon with Architect.

B. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds.

C. Temporary Planking: Provide temporary planking and working platforms as necessary to effectively complete work.

D. Setting Bases and Bearing Plates: Clean concrete and masonry surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of base and bearing plates.

1. Set loose and attached base plates and bearing plates for structural members on wedges or other adjusting devices.

a. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.

b. Pack grout solidly between bearing surfaces and base or bearing plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.

c. For proprietary grout materials, comply with manufacturer's instructions.

E. Field Assembly: Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure within specified AISC tolerances.

2. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at time of erection and mean temperature at which structure will be when completed and in service.

3. Splice members only where indicated and accepted on shop drawings.

F. Erection Bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds, and grind smooth at exposed surfaces.

1. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

    a. Do not enlarge unfair holes in members by burning or by use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.

G. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary members which are not under stress, as acceptable to Architect. Finish gas-cut sections equal to a sheared appearance when permitted.

H. Touch-up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting.

    1. Apply by brush or spray to provide minimum dry film thickness of 1.5 mils.

I. Touch-up Painting: Cleaning and touch-up painting of field welds, bolted connections, and abraded areas of shop paint on structural steel is included in Division 9 under painting work.

3.02 QUALITY CONTROL:

A. The Contractor shall make arrangement for and the Owner shall pay for an independent testing and inspection agency to inspect high-strength bolted connections and welded connections, to perform tests and prepare test reports. The Contractor will be responsible for all costs associated with failed tests.

    1. Testing agency shall conduct and interpret tests, and state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.

    2. Provide access for testing agency to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.

    3. Testing agency may inspect structural steel at plant before shipment; however, Architect reserves right, at any time before final acceptance, to reject material not complying with specified requirements.

    4. Correct deficiencies in structural steel work which inspections and laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expense, as may be necessary to reconfirm any non-compliance of original work, and as may be necessary to show compliance of corrected work.

B. Shop Bolted Connections: Inspect or test in accordance with AISC specifications.

C. Shop Welding: Inspect and test during fabrication of structural steel assemblies, as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.

2. Perform visual inspection of all welds.

3. Perform tests of welds as follows. Inspection procedures listed are to be used at Contractor's option:

a. Liquid Penetrant Inspection: ASTM E165.

b. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration not acceptable.

c. Radiographic Inspection: ASTM E94 and ASTM E142; minimum quality level "2-2T."

d. Ultrasonic Inspection: ASTM E164.

D. Field Bolted Connections: Inspect in accordance with AISC specifications.

E. Field Welding: Inspect and test during erection of structural steel as follows:

1. Verify certification of welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.

2. Perform visual inspection of all welds.

3. Perform tests of welds as follows:

a. Liquid Penetrant Inspection: ASTM E165.

b. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration not acceptable.

c. Radiographic Inspection: ASTM E94 and ASTM E142; minimum quality level "2-2T."

d. Ultrasonic Inspection: ASTM E164.

END OF SECTION

DIVISION 5 - METALS

SECTION 05300 - METAL DECKING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.

1.02 SUMMARY

A. Extent of metal decking is indicated on drawings, including basic layout and type of deck units required.

B. Header Duct used in conjunction with cellular metal floor deck is specified in Division 16; not work of this section.

1.03 SUBMISSIONS

A. General: Comply with pertinent provisions of Section 01300.

B. Product Data: Submit manufacturer's specifications and installation instructions for each type of decking and accessories. Include manufacturer's certification as may be required to show compliance with these specifications.

C. Shop Drawings: Submit detailed drawings showing layout and types of deck panels, anchorage details, and conditions requiring closure panels, supplementary framing, sump pans, cant strips, cut openings, special jointing, or other accessories.

D. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance.

1.04 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following codes and standards, except as otherwise indicated or specified:

1. AISI "Specification for the Design of Cold-Formed Steel Structural Members."

2. AWS D1.3 "Structural Welding Code - Sheet Steel."

3. SDI "Design Manual for Floor Decks and Roof Decks."

B. Qualification of Field Welding: Qualify welding processes and welding operators in accordance with "Welder Qualification" procedures of AWS D1.1.

1. Welded decking in place is subject to inspection and testing. Expense of removing and replacing portions of decking for testing purposes will be borne by Owner if welds are found to be satisfactory. Remove work found to be defective and replace with new acceptable work.

C. Underwriter's Label: Provide metal floor deck units listed in Underwriter's Laboratories "Fire Resistance Directory," with each deck unit bearing the UL label and marking for specific system detailed.

1. Provide cellular floor deck units listed in UL "Electrical Construction Materials List" with each cellular metal floor deck unit bearing UL labels and marking. Provide units which will permit use of standard header ducts and outlets for electrical distribution systems.

D. FM Listing: Provide metal roof deck units which have been evaluated by Factory Mutual System and are listed in "Factory Mutual Approval Guide" for "Class I" fire rated construction.

1.05 PRODUCT HANDLING

A. Protection: Use all means necessary to protect materials of this Section before, during, and after installation and to protect work and materials of all other trades.

B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

1. Metal Deck Units:

a. Bowman/E.G. Smith, Div. Cyclops Corporation.
b. Consolidated Systems, Inc.
c. Epic Metals Corporation.
d. Mac-Fab Products, Inc.
e. Roll Form Products, Inc.
f. United Steel Deck, Inc.
g. Vulcraft/Div. Nucor Corporation.
h. United Steel Deck, Inc.
i. Wheeling Corrugating Company.
j. Wolverine Deck Company.

2.02 MATERIALS

A. Steel for Galvanized Metal Deck Units: ASTM A446, Grade A.

B. Miscellaneous Steel Shapes: ASTM A36.

C. Sheet Metal Accessories: ASTM A526, commercial quality, galvanized.

D. Galvanizing: ASTM A653, G60.

E. Galvanizing Repair Paint: High zinc-dust content paint for repair of damaged galvanized surfaces complying with Military Specifications MIL-P-21035 (Ships).

F. Acoustic Sound Barrier Closures: Manufacturer's standard mineral fiber closures.

2.03 FABRICATION

A. General: Form deck units in lengths to span 3 or more supports, with flush, telescoped or nested 2" laps at ends and interlocking or nested side laps, unless otherwise indicated.

B. Roof Deck Units: Provide deck configurations complying with SDI "Roof Deck Specifications," of metal thickness, depth, and width as shown.

C. Metal Closure Strips: Fabricate metal closure strips, for cell raceways and openings between decking and other construction, of not less than 0.045" min. (18 gauge) sheet steel. Form to provide tight-fitting closures at open ends of cells or flutes and sides of decking.

D. Roof Sump Pans: Fabricate from single piece of 0.071" min. (14 gauge) galvanized sheet steel with level bottoms and sloping sides to direct water flow to drain, unless otherwise shown. Provide sump pans of adequate size to receive roof drains and with bearing flanges not less than 3" wide. Recess pans not less than 1-1/2" below roof deck surface, unless otherwise shown or required by deck configuration. Holes for drains will be cut in the field.

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine the areas and conditions under which metal decking is to be installed and correct conditions detrimental to the proper and timely completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General: Install deck units and accessories in accordance with manufacturer's recommendations and approved shop drawings, and as specified herein.

1. Place deck units on supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before being permanently fastened. Do not stretch or contract side lap interlocks.

2. Place deck units in straight alignment for entire length of run of cells and with close alignment between cells at ends of abutting units.

3. Place deck units flat and square, secured to adjacent framing without warp or excessive deflection.

4. Do not place deck units on concrete supporting structure until concrete has cured and is dry.

5. Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural members.

6. Do not use floor deck units for storage or working platforms until permanently secured.

B. Fastening Deck Units:

1. Fasten floor deck units to steel supporting members by not less than 3/4" diameter fusion welds or elongated welds of equal strength, spaced not more than 12" o.c. with a minimum of 2 welds per unit at each support.

   a. Tack weld or use self-tapping No. 8 or larger machine screws at 4'-0" o.c. for fastening end closures.

2. Fasten roof deck units to steel supporting members by not less than 1/2" diameter fusion welds or elongated welds of equal strength, spaced not more than 12" o.c. at every support, and at closer spacing where required for lateral force resistance. In addition, secure deck to each supporting member in ribs where side laps occur.

3. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work.

   a. Use welding washers where recommended by deck manufacturer.

4. Mechanically fasten side laps of adjacent deck units between supports, at intervals not exceeding 24" o.c., using self-tapping No. 8 or larger machine screws.

C. Keep the interiors of cells that will be used as raceways free of welds having sharp points or edges.

D. Cutting and Fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to the decking, as shown.

E. Reinforcement at Openings: Provide additional metal reinforcement and closure pieces as required for strength, continuity of decking, and support of other work shown.

F. Hanger Slots or Clips: Provide UL approved punched hanger slots between cells or flutes of lower element where floor deck units are to receive hangers for support of ceiling construction, air ducts, diffusers, or lighting fixtures.

1. Hanger clips designed to clip over male side lap joints of floor deck units may be used instead of hanger slots.

2. Locate slots or clips at not more than 14" o.c. in both directions, not over 9" from walls at ends, and not more than 12" from walls at sides, unless otherwise shown.

3. Provide manufacturer's standard hanger attachment devices.

G. Joint Covers: Provide metal joint covers at abutting ends and changes in direction of floor deck units, except where taped joints are required.

H. Roof Sump Pans: Place over openings provided in roof decking and weld to top decking surface. Space welds not more than 12" o.c. with at least one weld at each corner. Cut opening in roof sump bottom to accommodate drain size indicated.

I. Closure Strips: Provide metal closure strips at open uncovered ends and edges of roof decking, and in voids between decking and other construction. Weld into position to provide a complete decking installation.

J. Touch-up Painting: Cleaning and touch-up painting of field welds, abraded areas and rust spots, as required after erection and before proceeding with field painting, is included in Division 9 under Painting.

END OF SECTION

DIVISION 5 - METALS

SECTION 05400 - COLD FORMED METAL FRAMING

PART 1 - GENERAL

1.01 GENERAL:

A. Furnish labor, materials, tools, and equipment necessary or required to perform and complete the installation of cold formed framing as indicated on the drawings and specified herein. Shapes, sizes and accessories as specified and detailed shall establish the type of units and materials to be used to provide the functional and finished aesthetic requirements desired.

B. Drawings and general provisions of contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.02 SUMMARY:

A. Extent of cold-formed metal framing is shown on drawings.

B. Types of cold-formed metal framing units include the following:

1. "C" shaped load bearing and non-load bearing steel studs.
2. "C" shaped steel joists.
3. Track Sections
4. Hat Channels
5. Clip Angles

C. Related Sections include the following:

1. Section 03300 – Concrete
2. Section 04200 – Unit Masonry
3. Section 05120 – Structural Steel
4. Section 05500 – Miscellaneous Metal
5. Section 06100 – Rough Carpentry
6. Section 06200 - Finish Carpentry
7. Section 07200 – Building Insulation
8. Section 09250 – Gypsum Wallboard

1.03 REFERENCES:

A. AISI – Specification for the design of cold-formed steel structural members, code of standard practice (COSP).
B. ASCE 7 – Minimum design loads for building or other structures.
C. ASTM A90 – Standard test method for weight (mass) of coating on iron and steel articles with zinc or zinc alloy coatings.
D. ASTM A370 – Standard test methods and definitions for mechanical testing of steel products.

E. ASTM A653 – Standard specification for steel sheet, zinc coated (galvanized) or zinc iron alloy coated (galvannealed) by the hot-dip process.

F. ASTM A780 – Standard practice for repair of damaged and uncoated areas of hot-dip galvanized coatings.
G. ASTM A924 – Standard specification for general requirements for steel sheet, metallic coated by the hot-dip process.
H. ASTM A1003 – Standard specification for steel, sheet, cold rolled, carbon, structural, high strength low alloy and high strength low alloy with improved formability.
I. ASTM A1008 – Standard specification for steel, sheet and strip, hot rolled, carbon, structural, high strength low alloy and high strength low alloy with improved formability.
J. ASTM 1011 – Standard specification for steel, sheet and strip, hot rolled, carbon, structural, high strength low alloy and high strength low alloy with improved formability
K. ASTM B633 – Standard specification for elctrodeposited coatings of zinc and iron on steel.
L. ASTM C754 – Specification for installation of framing members to receive screw attached gypsum wallboard, backing board or water resistant backing board.
M. ASTM C840 – Standard specification for application and finishing of gypsum board.
N. ASTM C955 – Standard specification for load bearing (tranverse and axial) steel studs, runners (tracks), and bracing or bridging for screw application of gypsum panel products and metal plaster bases.
O. ASTM C1007 – Standard specification for installation of load bearing (transverse and axial) steel studs and related accessories.
P. ASTM C1513 – Standard specification for steel taping screws for cold formed steel framing connections.
Q. ASTM E84 – Standard test method for surface burning characteristics of building materials.
R. ASTM E90 – Method for laboratory measurement of airborne sound transmission loss of building partitions.

1.04 DESIGN REQUIREMENTS:

A. Fire Resistive Rating: Where fire rated construction is indicated on drawings, provide materials and construction that are identical to those assemblies whose fire resistance rating has been determined per ASTM E119 by a testing and inspecting organization acceptable to authorities having jurisdiction.

1. Meet or exceed fire resistance requirements outlined under provisions of the GA-600 Fire Resistance Design Manual for wall and ceiling assemblies.
2. Meet or exceed flame/fuel/smoke requirements of ASTM E84 surface burning characteristics for finish materials

B. Sound Transmission Characteristics: For specified wall assemblies with STC ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and

classified according to ASTM E413 by a qualified independent testing agency.

C. AISI Specifications: Comply with AISI's current 'Specification for the Design of Cold-Formed Steel Structural Members' and the following for calculating structural characteristics of cold formed metal framing:

1. CCFS Technical Bulletin: Current 'AISI Specification Provisions for Screw Connections'.

D. Fire Rated Assemblies: Where framing units are components of the assemblies indicated for a fire resistance rating, including those required for compliance with governing regulations, provide units which have been approved by governing authorities.

1.05 SUBMISSIONS:

A. All submissions shall be made in accordance with Section 01300 Submissions.

B. Product Data: Submit manufacturers data sheets on each product to be used, including:

1. Preparation instructions and recommendations
2. Storage and handling requirements and recommendations
3. Installation methods

C. Structural Calculations (For Structural Load Bearing or Supporting Assemblies):

1. Submit structural calculations prepared by manufacturer for approval. Submittal shall be sealed by a Professional Engineer registered in the state of the project
2. Description of design criteria
3. Engineering analysis depicting stress and deflection (stiffness) requirements for each framing application
4. Selection of framing components, accessories and welded connection requirements
5. Verification of attachments to structure and adjacent framing components
6. Engineer shall have a minimum of five (5) years experience with projects of similar scope

D. Shop Drawings (For Structural Load Bearing or Supporting Assemblies):

1. Submit shop drawings prepared by the manufacturer showing plans, sections, elevations, layouts, profiles and product components locations, including anchorage, bracing, fasteners, accessories and finishes.
2. Show connection details with screw types and locations, weld lengths and locations and other fastener requirements.

3. Where prefabricated or prefinished panels are to be provided, provide drawings depicting panel configurations, dimensions and locations

E. Welders Certificates: Submit manufacturers certificates, certifying welders employed on work, verifying AWS qualifications within the previous 12 months.

F. Mill Certificates: Signed by steel sheet producer indicating steel sheet complies with requirements, including uncoated steel thickness, yield strength, tensile strength, total elongation, chemical requirements, and galvanized-coating thickness.

1.06 QUALITY ASSURANCE:

A. Manufacturer Qualifications: Materials shall be provided by a firm that is experienced in manufacturing cold-formed metal framing similar to that indicated for this Project and with a record of successful in-service performance.

1. Assumes responsibility for designing cold-formed metal framing and connections to comply with performance requirements. This responsibility includes preparation of Shop Drawings and design calculations by a qualified professional engineer.

B. Installer Qualifications: Work shall be installed by an experienced installer who has completed cold-formed metal framing similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Professional Engineer Qualifications: A professional engineer who is licensed to practice in the jurisdiction where project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent. Engage a qualified Professional Engineer to prepare design calculations, shop drawings and other structural data.

D. Mock-Up: When requested by the Architect or owner, contractor shall provide a 4’x4’ mock-up for evaluation of workmanship for each type of cold formed metal framing specified/required by the project.

1. Construct areas designated by Architect.
2. Do not proceed with remaining work until material, details, and workmanship are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.
4. Demolish mock-up at a time as a designated by the Architect.

1.07 DELIVERY, STORAGE, and HANDLING:

A. Store products in manufacturers unopened packaging until ready for installation.

B. Store materials protected from exposure to rain, snow or other harmful weather conditions, at temperature and humidity conditions per AISI COSP Section F3.

1.08 Project Conditions:

A. Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturers absolute limits.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. Manufacturers: Subject to compliance with requirements, provide products of one of the following:

1. Marino/WARE
2. Clark Steel Framing Systems.
3. Dietrich Metal Framing.

2.02 METAL FRAMING:

A. System Components: With each type of metal framing required, provide manufacturer's standard U-shaped steel runners (tracks), blocking, lintels, clip angles, shoes, reinforcements, fasteners, and accessories as recommended by manufacturer for applications indicated, as needed to provide a complete metal framing system.

B. Materials and Finishes:

1. For 16-gauge and heavier units, fabricate metal framing components of structural quality steel sheet with a minimum yield point of 50,000 psi; ASTM A 446, A 570, or A 611.
2. For 18-gauge and lighter units, which will only be attached mechanically, fabricate metal framing components of commercial quality steel sheet with a minimum yield point of 37,000 psi; ASTM A 446, A 570, or A 611.

C. Provide galvanized finish to metal framing components complying with ASTM A525 for minimum G90 coating.

1. Finish of installation accessories to match that of main framing components, unless otherwise indicated.

D. "C"-shaped Studs: Manufacturer's standard load-bearing steel studs of size, shape, and gauge indicated, with 2" flange and flange return lip.

E. Punched Channel Studs: Manufacturer's standard factory-punched, load-bearing steel studs of size, shape, and gauge indicated, with 1.375" flange.

E. Hat Shaped Furring Channels: 22 gauge with minimum 1/2” wide flanges. Minimum depth 3/4” unless otherwise noted on drawings.

F. Joists: Manufacturer's standard C-shape sections of size, shape, and gauge indicated.

G. Framing Accessories:

1. Fabricate steel framing accessories of the same material and finish used for framing members, with a minimum yield strength equal to that of main components.
2. Provide accessories of manufacturer’s standard thickness and configuration, unless otherwise indicated, as follows:

a. Supplementary framing.
b. Bracing, bridging and solid blocking.
c. Web stiffeners.
d. End clips.
e. Gusset plates.
f. Stud kickers, knee braces and girts.
g. Hole reinforcing plates.
h. Backer plates.

2.03 FABRICATION:

A. General: Framing components may be prefabricated into panels prior to erection. Fabricate cold-formed metal framing and accessories plumb, square, true to line, and braced against racking with joints welded. Perform lifting of prefabricated panels in a manner to prevent damage or distortion.

1. Fabricate framing assemblies in jig templates to hold members in proper alignment and position and to assure consistent component placement.
2. Cut framing members by sawing or shearing; do not torch cut.
3. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator.
4. Fasten other materials to cold-formed metal framing by welding, bolting or screw fastening, according to shop drawings.

B. Mechanical Fasteners: ASTM C1513, corrosion resistant coated, self-drilling, self-tapping steel drill screws. Minimum two (2) screws per connection.

C. Fabrication Tolerances: Fabricate assemblies level, plumb and true to line, to a maximum allowable tolerance variation of 1/8 inch in 10 feet, and as follows:

1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch.

D. Reinforce, stiffen and brace framing assemblies to withstand handling, delivery and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.

PART 3 - EXECUTION

3.01 INSPECTION AND PREPARATION:

A. Pre-installation Conference: Prior to start of installation of metal framing systems, meet at project site with installers of other work including door and window frames and mechanical and electrical work. Review areas of potential interference and conflicts, and coordinate layout and support provisions for interfacing work.

1. Verify that concealed wood/sheet steel blocking has been installed the proper locations.

B. Examine substrates to which metal framed construction attaches or abuts. Verify pre-set hollow metal frames, cast in anchors, and structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of wall framing.

C. Preparation: Grout bearing surfaces uniform and level to ensure full contact of bearing flanges or track webs on supporting concrete or masonry construction.

3.02 INSTALLATION, GENERAL:

A. Manufacturer's Instructions: Install metal framing systems in accordance with ASTM C 1007 and manufacturer's printed or written instructions and recommendations, unless otherwise indicated.

B. Runner Tracks: Install continuous tracks sized to match studs. Align tracks accurately to layout at base and tops of studs. Secure tracks as recommended by stud manufacturer for type of construction involved, except do not exceed 24" o.c. spacing for nail or power-driven fasteners. Provide fasteners at corners and ends of tracks.

1. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.
2. Where stud system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners to supporting structure.
3. Install supplementary framing, blocking, and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim, and furnishings, and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations and industry standards in each case, considering weight or loading resulting from item supported.

C. Installation of Wall Stud System: Secure studs to top and bottom runner tracks by screw fastening at both inside and outside flanges.

1. Frame wall openings larger than 2'-0" square with double stud at each jamb of frame except where more than 2 are either shown or indicated in manufacturer's instructions. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full-height studs of wall. Secure stud system wall opening frame in manner indicated.
2. Frame both sides of expansion and control joints, with separate studs; do not bridge the joint with components of the stud system. Independently frame both sides of joints.
3. Install horizontal stiffeners in the stud system, spaced (vertical distance) at not more than 4'-6" o.c. Mechanically fasten at each intersection.
4. Fasten hole reinforcing plates over web penetrations that exceed the size of the manufacturer’s standard punched openings.

D. Erection Tolerances: Bolt or weld wall panels (at both horizontal and vertical junctures) to produce flush, even, true to line joints.

1. Step in face and jog in alignment between panels not to exceed 1/16".

E. Insulation: Install insulation in exterior framing members, headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

3.03 REPAIRS AND PROTECTION:

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings and all welded areas on fabricated and installed cold-formed metal framing with galvanized repair paint, according to ASTM A 780 and manufacturer’s written instructions. Wire brush slag off of all welds.

END OF SECTION

DIVISION 5 - METALS

SECTION 05500 – MISCELLANEOUS METAL

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included: Provide all miscellaneous metal and metal fabrications, complete and installed, as shown on the Drawings, specified herein, or needed for a complete and proper installation of all building components, which may not be specifically called for under other sections of these Specifications.

B. Related Sections:

1. Section 04200 – Unit Masonry
2. Section 05120 - Structural Steel
2. Section 05210 – Steel Joists and Girders
3. Section 05300 - Metal Decking
4. Section 05400 - Cold-Formed Metal Framing
5. Section 05512 – Wrought-Iron Railings
6. Section 05514 – Steel Railings
7. Section 05516 – Aluminum Railings

1.02 QUALITY ASSURANCE

A. Standards: Comply with standards specified herein and as listed in Section 01085 – Applicable Standards.

B. Qualifications of Personnel: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

C. Welding: Perform all shop and field welding required in connection with the work of this Section, adhering strictly to the current pertinent recommendations of the American Welding Society.

1.03 SUBMISSIONS

A. Comply with provisions of Section 01300 and as modified below.

B. Product Data:

1. Complete materials list of all items proposed to be furnished and installed under this Section.

2. Manufacturers' product data, specifications, and other data required to demonstrate compliance with specified requirements.

C. Shop Drawings: The Contractor shall prepare and submit shop

drawings covering all items of work of this section. The drawings shall show all dimensions and details of construction, installation and relation to adjoining and related work where same requires cutting or close fitting, and shall show all reinforcement, gauges of metal, anchorage, reinforcing, and other work required for complete installation.

1. Provide templates for bolts and/or anchorage installation by other trades.

1.04 COORDINATION

A. All work under this section shall be properly coordinated with the work of other sections and contracts which affects or is affected by work of this section. To this end, close cooperation shall exist between trades and/or Contractors installing other work in any way affecting or affected by work under this section.

B. Shop drawings shall be exchanged between the trades and/or Contractors so affected to the end that all work shall properly receive or be received by work under other sections, and the entire operation shall be a harmonious whole.

1.05 WORKMANSHIP AND INSTALLATION

A. All work included under this section shall be installed by the contractor at the proper time, and as rapidly as progress of the adjacent and connecting work will permit. All work to be set by others shall be delivered when required by them. The Contractor shall consult with the various other contractors installing adjoining work regarding the methods to be employed in connecting the several materials. Holes and connections for the work of other trades shall be provided as necessary.

B. All work shall be erected and secured plumb and true to line, and finished smooth and clean from fine and noticeable irregularities or file marks. Ferrous metals entering or adjoining exterior masonry surfaces shall be insulated from it with lead shields and by an approved non-staining elastic cement of approved color.

1.06 VERIFYING CONDITIONS

A. Verify all measurements in the field, as required, for work fabricated to fit conditions at the building. Before starting work, examine all adjoining work on which the work of this section is in any way dependent for perfect workmanship and fit. Do such corrective work to adjoining work as may be necessary to make the work of this section perfect in all respects.

1.07 PRODUCT HANDLING

A. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation and to protect the work and materials of all other trades.

B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 GENERAL

A. All metals shall be free from defects impairing strength or durability, and of best commercial quality for purposes specified. Metals shall be made with structural properties to withstand safely the strains and stresses to which they will normally be subjected.

B. For fabrication of the work of this Section which will be exposed to view, use only those materials which are smooth and free from surface blemishes including pitting, seam marks, roller marks, rolled trade names, and roughness.

C. Standards: All materials shall comply with the latest version of the standard documents indicated:

1. Steel plates, shapes, and bars: ASTM A36.

2. Steel plates to be bent or cold formed: ASTM A283, Grade C.

3. Steel tubing, hot-formed, welded, or seamless: ASTM A501.

4. Steel bars and bar-size shapes: ASTM A306 Grade 65, or ASTM A36.

5. Cold-finished steel bars: ASTM A108, grade as selected by the fabricator.

6. Cold-rolled carbon steel sheets: ASTM A336.

7. Galvanized carbon steel sheets: ASTM A526, with ASTM A525, G90, zinc coating.

8. Stainless steel sheets: Type 302/304 of American Iron and Steel Institute, 24 gauge, with No. 4 finish.

9. Gray iron castings: ASTM A48, Class 30.

10. Malleable iron castings: ASTM A47, grade as selected by the fabricator.

11. Steel pipe: ASTM A53, type as selected, Grade A, black finish unless galvanizing is required, standard weight (Schedule 40) unless otherwise indicated.

12. Concrete inserts: Threaded or wedge type, galvanized ferrous

castings, either malleable iron ASTM A47 or cast steel ASTM A27. Provide bolts, washers, and shims as required, hot-dip galvanized, ASTM A153.

13. Non-shrink non-ferrous grout: CE CRD C588.

14. Aluminum extrusions shall be free of roll marks, scratches, rolled-in streaks and any other defect which may affect the uniform appearance of finished surfaces.

15. Aluminum extrusions must be at least 0.8" thick and sheet or plate, at least No. 16 gauge.

16. Aluminum pipe: 6063-T6 alloy.

17. Schedule of Aluminum Finishes:

    a. Exposed exterior extrusions (except saddles, louvers, railings, and windows): 215-R1.

    b. Exposed exterior sheet and plate: 215-R1.

    c. Exposed interior extrusions: 204-R1.

    d. Exposed interior sheet and plate: 204-R1.

    e. Extrusion, sheet plate not exposed: Mill.

    f. Casting: F.

2.02 WORKMANSHIP

A. General workmanship requirements:

1. Use materials of size and thickness shown, or if not shown, of required size and thickness to produce sufficient strength and durability in the finished product.

2. Work to dimensions shown or accepted on the Shop Drawings, using proven details of fabrication and support.

3. Use type of materials shown or specified for the various components of the work.

4. Form exposed work true to line and level, with accurate angles and surfaces and with straight, sharp edges.

5. Ease the exposed edges to a radius of approximately 0.8-mm (1/32") unless otherwise shown.

6. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

7. Weld corners and seams continuously, complying with AWS

recommendations. At exposed connections, grind exposed welds smooth and flush; match and blend with adjoining surfaces.

8. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type shown or, if not shown, use Phillips flat-head (countersunk) screws or bolts.

9. Provide for anchorage of the type shown. Coordinate with supporting structure. Fabricate and space the anchoring devices to provide adequate support for intended use.

10. Cut, reinforce, drill, and tap miscellaneous metal work as indicated to receive finish hardware and similar items.

2.03 FABRICATIONS

A. Rough hardware:

1. Provide bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete and other structures.

2. Manufacture or fabricate items of sizes, shapes, and dimensions required.

3. Provide malleable iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

B. Loose bearing and leveling plates:

1. Provide loose bearing and leveling plates for steel items bearing on concrete construction, made flat, free from warps or twists, and of required thickness and bearing area.

2. Drill plates for anchor bolts and for grouting as required.

3. Galvanize after fabrication.

C. Miscellaneous framing and supports:

1. Provide miscellaneous steel framing and supports which are not part of structural steel framework, as required to complete work.

3. Fabricate miscellaneous units to sizes, shapes, and profiles shown; or, if not shown, of required dimensions to receive adjacent other work to be retained by framing.

4. Fabricate the miscellaneous units from structural steel shapes, plates, and steel bars of welded construction with mitered joints for field connection, unless otherwise shown.

5. Cut, drill, and tap units to receive hardware.

6. Equip units with integrally welded anchors for casting into concrete or building into masonry, and furnish inserts if units must be installed after concrete is placed.

7. Except as otherwise shown on Construction Drawings, space anchors at 24" on centers, and provide minimum anchor units of 1-1/4" x 1/4" x 8" steel straps.

8. Galvanize miscellaneous frames and supports where indicated.

D. Loose Lintels:

1. Provide loose lintels for all trades, over all openings where lintels are not shown on structural drawings or where door bucks over 3'-0" wide are not reinforced. Provide loose lintels for all door bucks, greater than 5'-0" carrying masonry above. For each 4" thickness of masonry, provide one 3 1/2" x 3 1/2" x 5/16" angle at spans 3'-0" or less; 6" x 3 1/2" x 3/8" angle at spans 3'-0" to 6'-4". For 6" thick walls, provide WT 7 x 11 for spans 3'-0" to 6'-4". For spans 6'-4" to 8'-0" at 6" walls, provide WT 7 x 13. Provide lintels at heads of all aluminum bucks where not indicated on structural drawings.

2. All exterior lintels and miscellaneous framing to be galvanized.

E. Steel framed stairs:

1. General:

a. Use welding for joining pieces together, unless otherwise shown or specified. Fabricate units so that bolts and other fastenings do not appear on finish surfaces. Make joints true and tight, and make connections between parts lightproof tight. Provide continuous welds, ground smooth where exposed.

b. Construct stair units to conform to sizes and arrangements shown. Provide all components for the support of stairs and platforms.

2. Stair framing:

a. Fabricate stringers from structural steel channels, or plates, or a combination thereof as shown. Provide closures for ends of stringers.

b. Construct platforms of structural steel channel headers and miscellaneous framing members in the arrangement shown. Bolt or weld stringers to stringers.

3. Metal pan units: Form from structural steel sheet of the gauge shown on the drawings, and to the configuration shown on the drawings. Provide platforms of the same metal and gauge as

indicated for pans, unless otherwise indicated.

F. Saddles:

1. Saddles shall be cast abrasive aluminum fitted to full width of frame opening.

2. Set level by shimming in full bed of mastic and fasten with FHCS screws.

2.04 FASTENERS

A. General: Provide zinc-coated fasteners for exterior use and where built into exterior walls. Select fasteners for the type, grade, and class required.

B. Standards: All fasteners shall comply with:

1. Bolts and nuts: Regular hexagon-head type, ASTM A307, Grade A.

2. Lag bolts: Square-head type, Fed. Spec. FF-B-561.

3. Machine screws: Cadmium plated steel, Fed. Spec. FF-S-92.

4. Wood screws: Flat-head carbon steel, Fed. Spec. FF-S-111.

5. Plain washers: Round, carbon steel, Fed. Spec. FF-W-92.

6. Masonry anchorage devices: Expansion shields, Fed. Spec. FF-S-325.

7. Toggle bolts: Tumble-wing type, Fed. Spec. FF-B-588, type, class, and style required.

8. Lock washers: Helical spring type carbon steel, Fed. Spec. FF-W-84.

2.05 PAINT/FINISHING

A. Shop priming:

1. Shop prime all ferrous miscellaneous metal work, except surfaces and edges to be field welded and galvanized surfaces, unless otherwise specified.

a. Remove oil, grease, and similar contaminants in accordance with SSPC-SP-1.

b. Clean off heavy rust and loose mill scale in accordance with SSPC-SP-2 or SSPC-SP-3.

c. Immediately after surface preparation, brush or spray on primer in accordance with manufacturer's recommendations, and at a rate to provide the recommended dry film thickness.

2. Use painting methods which will result in full coverage of joints, corners, edges, and exposed surfaces.

3. Primer for ferrous metals: 10-1009 Gray Metal Primer by Tnemec Co., Inc.

4. Primer for Loose and Hung Steel Lintels: 50-330 Poly-Ura-Prime by Tnemec Co., Inc.

   a. Lintel angles for exterior veneer, either loose or hung, shall be hot dip galvanized. Final painting shall be after installation, but prior to installation of items such as windows or louvers that would conceal the lintel or portion thereof.

5. Non-visible ferrous metals, such as structural steel, bearing plates or anchorage, which will be exposed to building cavities or set below grade shall be painted with Benjamin more M47/M48 Coal Tar Epoxy.

6. All listed primers shall be compatible with finish coats of paint. Coordinate selection of metal primer with actual finish paint provided under Section 09900 of these Specifications.

2.06 GALVANIZING

A. Provide hot-dip zinc coating for those items shown or specified to be galvanized, as follows:

   1. ASTM A153 for galvanizing iron and steel hardware.

   2. ASTM A123 for galvanizing rolled, pressed, and forged steel shapes, plates, bar, and strip 3 mm (1/8") thick and heavier.

   3. ASTM A386 for galvanizing assembled steel products.

B. Galvanizing repair paint: Use a high zinc dust content paint for regalvanizing welds in galvanized steel, or to repair damage incurred during handling and installation, complying with MIL SPEC MIL-P-21035.

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine the areas and conditions under which miscellaneous metal items are to be installed, and correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Furnish setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, anchor bolts, and miscellaneous items having integral anchors, which are to be embedded in concrete construction. Coordinate delivery of such items to project site.

3.03 INSTALLATION

A. Setting loose plates:

1. Clean concrete bearing surfaces free from bond-reducing materials, and roughen to improve bond to surfaces. Clean the bottom surface of bearing plates.

2. Set loose leveling and bearing plates on wedges, or other adjustable devices.

3. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims; but if protruding, cut off flush with the edge of the bearing plate before packing with grout.

3. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

B. Setting lintels:

1. Bear 8" minimum at each side of opening wherever possible. Furnish clip angles or other approved connection securely anchored to supporting construction and bolt to lintels wherever 8" bearing is not possible.

C. Installing stairs:

1. Install in accordance with approved shop drawings, providing all anchorage, welding, or bearing as specified on said shop drawings.

D. Fastening to in-place construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction including threaded fasteners for concrete inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.

E. Cutting, fitting, and placement:

1. Perform cutting, drilling, and fitting required for installation of miscellaneous metal fabrications.

2. Set work accurately in location, alignment, and elevation, and make plumb, level, true, and free from rack, measured from

established lines and levels.

3. Provide temporary bracing or anchors in formwork for items which are to be built into concrete or similar construction.

4. Fit exposed connections accurately together to form tight hairline joints.

5. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations.

6. Grind exposed joints smooth, and touch up shop paint coat. Do not weld, cut, or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.

F. Field welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of weld made, and methods in correcting welding work.

G. Touch up painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting. Apply by brush or spray to provide minimum dry film thickness of 2.0 mils.

3.04 CLEANING, ACCEPTANCE, AND PROTECTION

A. All work shall be properly protected from defacement or damage. Defective work shall be satisfactorily repaired or removed and replaced at no additional cost to the Owner.

B. Upon completion, inspection, and approval by the Architect, the ornamental work of this section shall be cleaned with a mild soap and water or a petroleum distillate and all temporary protective coatings removed, except Methacrylate Lacquer.

C. All operative items shall be adjusted to work properly and the work left whole, clean, and in perfect condition.

END OF SECTION

DIVISION 6 - WOOD AND PLASTICS

SECTION 06100 - ROUGH CARPENTRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this Section.

1.02 SUMMARY

A. Types of work in this section include rough carpentry for:

1. Framing with dimensional lumber as shown on the drawings and as specified herein.

2. Plywood, OSB, particleboard panels and/or other sheathing as shown on the drawings and as specified herein.

3. Wood blocking, nailers and/or sleepers.

1.03 RELATED SECTIONS

A. 06170 – Prefabricated Structural Wood.

B. 06164 – Gypsum Sheathing.

C. 06200 – Finish Carpentry.

D. 07200 – Building Insulation.

E. 07231 – Air Vapor Barrier System.

F. 07241 – Direct Applied Exterior Finish Systems.

G. Various Division 7 Roofing Specifications.

H. Various Division 9 Finishes Specifications.

F. If designated as a LEED project, then also:

1. Division 1 Section "LEED Requirements" for recycled content and regional materials requirements, submittals and additional LEED requirements.

2. Division 1 Section "Construction Waste Management" for recycling construction waste.

1.04 DEFINITIONS

A. Rough Carpentry: Carpentry work not specified as part of other sections and which is generally not exposed, except as otherwise indicated.

B. Exposed Framing: Framing not concealed by other construction.

C. Dimensional Lumber: Lumber of 2 inches nominal or greater, but less than 5 inches nominal in least dimension.

1.05 QUALITY ASSURANCE

A. All materials shall be provided and all work shall be performed in accordance with the NYS Uniform Building Code requirements (current version).

B. Lumber shall be certified by the following authorities/grading agencies:

1. NELMA: Northeastern Lumber Manufacturers' Association.

2. NLGA: National Lumber Grades Authority.

3. RIS: Redwood Inspection Service.

4. SPIB: The Southern Pine Inspection Bureau.

5. WCLIB: West Coast Lumber Inspection Bureau.

6. WWPA: Western Wood Products Association.

7. FSC: Forest Stewardship Council.

1.06 SUBMISSIONS

A. All submissions shall be made in accordance with Section 01300 - Submissions and as modified below.

B. Material Certificates: Where dimensional lumber is provided to comply with minimum allowable unit stresses, submit a listing of species and grade selected for each use, and submit evidence of compliance with specified requirements. Compliance may be in forms of a signed copy of applicable portion of lumber producer's grading rules showing design values for selected species and grade. Design values shall be as approved by the Board of Review of American Lumber Standards Committee.

C. Wood Treatment Data: Submit chemical treatment manufacturer's instructions for handling, storing, installation, and finishing of treated material.

1. Preservative Treatment: For each type specified, include certification by treating plant stating type of preservative solution and pressure process used, note amount of preservative retained, and conformance with applicable standards.

a. For water-borne treatment include statement that moisture content of treated materials was reduced to levels indicated prior to shipment to project site.

b. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

D. LEED Submittals; for projects requiring LEED certification, submit the following additional information:

1. Submit recycled content and regional materials documentation for each type of product provided under work of this Section in accordance with Section 01352 "LEED Requirements".

2. Credit EQ 4.1: Manufacturers' product data for interior field-applied construction adhesive, including printed statement of VOC content in accordance with Section 01352 "LEED Requirements".

3. Credit EQ 4.4: Composite wood manufacturer's product data for each composite wood product used indicating that product's bonding agent contains no urea formaldehyde in accordance with Section 01352 "LEED Requirements".

4. Forest Certification for the following wood products; materials produced from wood obtained from forests certified by a Forest Stewardship Council (FSC)-accredited certification body to comply with FSC 1.2, "Principles and Criteria":

1. Dimensional lumber framing.

2. Plywood.

1.07 DELIVERY, STORAGE AND PRODUCT HANDLING

A. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels flat with spacers between each bundle to provide for air circulation around stacks and under coverings.

PART 2 - MATERIALS

2.01 LUMBER, GENERAL

A. Lumber Standards: Manufacture lumber to comply with *"Voluntary Lumber Standard"* DOC PS20-10, or most current edition, and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.

1. Grade Stamps: Factory-mark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill..

2. Where nominal sizes are indicated, provide actual sizes required by DOC PS20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

3. Provide dressed lumber, S4S, unless otherwise indicated.

4. Plywood Standards: Comply with the latest edition of U.S.

Product Standard PSI and APA performance standards.

5. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing and shipment for sizes 2" or less in nominal thickness, unless otherwise indicated.

B. Inspection Agencies: Inspection agencies and the abbreviations used to reference with lumber grades and species include the following:

1. SPIB: Southern Pine Inspection Bureau.
2. WWPA: Western Wood Products Association.

C. Grade Stamps: Factory-mark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing and mill.

2.02 FRAMING LUMBER

A. For items of dimensional lumber size, provide Construction or No. 2 grade lumber with 15 percent maximum moisture content of any species, unless otherwise noted on the Construction Drawings.

1. Hem-fir (north); NLGA.

2. Mixed southern pine; SPIB.

3. Spruce-pine-fir; NLGA.

4. Hem-fir; WCLIB, or WWPA.

5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

6. Species group below includes hem-fir and spruce-pine-fir (south).

7. Western woods; WCLIB or WWPA.

8. Northern species; NLGA.

2.03 MISCELLANEOUS LUMBER

A. Provide wood for support or attachment of other work including cant strips, nailers, blocking, furring, grounds, stripping, rooftop equipment bases and support curbs, and similar members. Provide lumber sizes indicated, worked into shapes shown.

1. Grade: Standard grade light framing size lumber of any species or board size lumber as required. No. 3 Common or Standard grade boards per WCLIB or WWPA rules or No. 3 boards per SPIB rules.

2.04 PLYWOOD PANELS AND ROOF SHEATHING

A. Plywood must contain no urea-formaldehyde resins.

B. Telephone and Electrical Equipment Backing Panels: DOC PS1, Exposure

1, C-D Plugged, in thicknesses as indicated, not less than ½ inch nominal thickness.

C. Plywood Roof Sheathing: Exposure 1, Structural 1 sheathing.

1. Span Rating: Not less than 48/24.

2. Nominal Thickness: Not less than 23/32 inch.

2.05 MISCELLANEOUS MATERIALS

A. Fasteners and Anchorages: Provide size, type, material, and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers, and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommended nails.

1. Where rough carpentry work is exposed to weather, in ground contact, pressure-preservative treated, or in areas of high relative humidity, provide fasteners and anchorages with a hot-dip zinc coating, complying with ASTM A153.

2. Nails, brads and staples shall comply with ASTM F 1667.

3. Power-Driven fasteners shall comply with NES NER-272.

4. Wood Screws shall comply with ASME B18.6.1.

5. Lag Bolts shall comply with ASME B18.2.1.

6. Bolts: Steel bolts shall comply with ASTM A307, Grade A; with ASTM A563 hex nuts and, where so indicated, flat washers.

7. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

a. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

b. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

8. Metal Framing Anchors (where applicable):

a. Basis-of-Design Products: Subject to compliance with requirements, provide products indicated on Drawings or engineered-approved equals by one of the following:

a. Simpson Strong-Tie Co., Inc.

b. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer that meet or exceed those indicated of basis-of-design products. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

c. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet, complying with ASTM A 653, G60 (Z180) coating designation.

d. Rafter Tie-Downs (Hurricane or Seismic Ties): Bent strap tie for fastening rafters or roof trusses to wall studs below, 2-1/4 inches wide by 0.062 inch thick. Tie fits over top of rafter or truss and fastens to both sides of rafter or truss, face of top plates, and side of stud below.

D. Building Paper: Asphalt saturated felt, non-perforated conforming to ASTM D226.

E. In the absence of requirements of section 07231, provide a self-adhering vapor-permeable air barrier membrane; Blueskin Breather manufactured by Henry; a self-adhering membrane consisting of a microporous film laminate, backed with a specially applied adhesive, which allows water vapor to permeate through while acting as a barrier to air and rain water. Membrane shall have the following physical properties:

1. Air leakage: <0.002 CFM/ft2 @ 1.6 lbs/ft2 to ASTM E283-91.

2. Water vapor permeance: 37 perms to ASTM E 96.

3. Membrane Thickness: 17 mils.

4. Low temperature flexibility -40 degrees F: Pass to ASTM D3111.

5. Hydrostatic Water Resistance: 18 psi ASTM D751 Procedure

E. Sill Sealer Gaskets: Glass fiber resilient insulation fabricated in strip form for use as a sill sealer; 1" nominal thickness compressible to 1/32"; selected from manufacturer's standard widths to suit width of sill members indicated; in rolls of 50' or 100' in length.

F. Water-Repellent Preservative: (for exposed ends of posts and beams, not for treating cuts in preservative-treated lumber): NWWDA-tested and accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.

G. Construction Adhesive: Use adhesives that have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.06 FIRE RETARDANT-TREATED LUMBER

A. General: Where fire-retardant-treated lumber and plywood are indicated, use materials impregnated with fire-retardant chemicals by a pressure process or other means acceptable to authorities having jurisdiction to produce products with the following fire-test-response characteristics:

1. Flame-spread index of not greater than 25 when tested according to ASTM E 84.

B. For exposed items indicated to receive transparent finish, do not use chemical formulations that contain colorants or that bleed through or otherwise adversely affect finishes.

C. Exterior-Type Fire-Retardant Treatment: Organic-resin-based formulation that shows no increase in flame spread of treated material after being weathered according to ASTM D 2898, Method A.

D. Kiln-dry material after treatment to levels required for untreated material. Do not use material that does not comply with requirements for untreated material or is warped or discolored.

E. Acceptable pressure-impregnated products include Hoover's Pyro-Guard for interior applications and Exterior Fire-X for exterior applications.

2.07 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: Where lumber or plywood is indicated as "Trt-Wd" or "Treated," or is specified herein to be treated, comply with applicable requirements of AWPA Standards C2 (Lumber) and C9 (Plywood) and of AWPB Standards listed below, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX). Mark each treated item with the AWPB Quality Mark Requirements, and with the quality mark of an inspection agency approved by the ALSC Board of Review.

1. Pressure-treat above-ground items with water-borne preservatives to comply with AWPB LP-2, acceptable to authorities having jurisdiction and containing no arsenic or chromium. After treatment, kiln-dry lumber and plywood to a maximum moisture content, respectively, of 19 percent and 15 percent. Do not use material that is warped or does not comply with requirements for untreated material. Treat indicated items and the following:

   a. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

   b. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

c. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.

d. Wood framing members less than 18" above grade, in crawl spaces or unexcavated areas.

e. Wood floor plates that are installed over concrete slabs-on-grade.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Discard units with material defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.

B. Set carpentry work to required levels and lines, with members plumb and true to line and cut and fitted.

C. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other work.

D. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.

1. Unless otherwise indicated on the Construction Drawings, framing shall be at 16” centers.

E. Metal Anchors for Engineered Wood Products (where applicable): Install metal anchors to comply with manufacturer's written instructions.

F. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber.

G. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.

2. Use copper naphthenate for items not continuously protected from liquid water.

H. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards. Comply with Table 2304.10.1 – “Fastening Schedule” in ICC’s International Building Code. Provide all blocking and framing as indicated and as required in order to support facing materials, fixtures, specialty items, and trim.

I. Use common wire nails, except as otherwise indicated; use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

J. Do not splice structural members between supports.

3.02 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

A. Provide wherever shown and where required for attachment to other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.

B. Attach to substrate as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

C. Provide permanent grounds of dressed, preservative treated, key-beveled lumber not less than 1-1/2" wide and of thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.

3.03 WALL AND PARTITION FRAMING

A. General: Provide single bottom plate and double top plates using members of 2-inch nominal thickness, whose widths equal that of studs. Fasten plates to supporting construction.

1. Space wood studs at 16 inches o.c., unless otherwise indicated.

2. Provide continuous horizontal blocking at mid-height of partitions more than 96 inches high, using members of 2-inch nominal thickness, and of same width as wall or partitions.

B. Construct corners and intersections with three (3) or more studs.

C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb (jack) studs.

1. For load-bearing walls, provide double-jamb (jack) studs for openings 60 inches and less in width, and triple-jamb (jack) studs for wider openings. Provide headers of depth indicated on the drawings.

D. Provide diagonal bracing in walls, at locations indicated, full-story height, unless otherwise indicated.

3.04 FLOOR JOIST FRAMING

A. Space joists at 16 inches o.c., unless otherwise indicated.

1. Set each joist with crown up.

2. Provide continuous horizontal blocking at mid-span of joists, using members of same nominal size of joists.

B. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of joists.

1. Provide double-joists, nailed together, directly beneath non-bearing partition walls when joist run parallel to said walls.

3.05 RAFTER FRAMING

A. Rafters: Notch to fit exterior wall plates and use metal framing anchors. Double rafters to form headers and trimmers at openings in roof framing, if any, and support with metal hangers. Where rafters abut ridge, place directly opposite each other and nail to ridge member, or use metal ridge hangers.

1. Space wood rafters at 16 inches o.c., unless otherwise indicated.

2. Set each rafter with crown up.

B. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions, if any.

3.06 PLYWOOD SHEATHING

A. General: Comply with applicable recommendations in APA Form No. E30S, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Install with the long dimension of the panel across supports, except where noted, and with panel continuous over two or more spans. Suitable edge support shall be provided where indicated on drawings (or in recommendations of the American Plywood Association) by use of panel clips, tongue-and-groove panels, or lumber blocking between joists. Panel end joints shall occur over framing. Allow 1/8-inch spacing at panel ends and 1/4-inch at panel edges, unless otherwise recommended by the panel manufacturer.

C. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.

D. Nail 6 inches o.c. along panel edges and 12 inches o.c. at intermediate supports, except that when supports are spaced 48 inches o.c. or more, space nails 6 inches o.c. at all supports. Use 6d common nails for panels 1/2-inch and less and 8d for greater thicknesses, except that when panels are 1-1/8 inch, use 8d ringshank or 10d common.

3.07 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

DIVISION 6 - WOOD AND PLASTICS

SECTION 06200 - FINISH CARPENTRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of contract, including General and Supplementary Conditions, Division 1 Specification sections, apply to work of this section.

1.02 SUMMARY

A. Types of work in this section include finish carpentry for:

1. Exterior standing and running trim.

2. Interior standing and running trim.

3. Interior plywood.

4. Window stools & aprons.

5. Closet shelving.

B. Casework, cabinetry, countertops, and wainscot paneling systems are specified in other Division 6, Division 11, and Division 12 sections.

1.03 RELATED SECTIONS

A. 06100 – Rough Carpentry.

B. Various Division 9 Finishes Specifications.

C. If designated as a LEED project, then also:

1. Division 1 Section "LEED Requirements" for recycled content and regional materials requirements, submittals and additional LEED requirements.

2. Division 1 Section "Construction Waste Management" for recycling construction waste.

1.04 QUALITY ASSURANCE

A. Lumber: Comply with Voluntary Product Standard PS-20. Lumber shall bear grade and trademark of the association under whose rule it is produced.

1. Southern Forest Products Association (SFPA).

2. West Coast Lumber Inspection Bureau (WCLIB).

3. American Plywood Association (APA).

4. Western Wood Products Association (WWPA).

5. American Wood Preservers Bureau (AWPB).

6. National Woodwork Manufacturer's Association (NWMA).

7. National Hardwood Lumber Association (NHLA).

8. Architectural Woodwork Institute (AWI).

9. Wood Moulding and Millwork Producers (WM).

10. Forest Stewardship Council (FSC).

B. Plywood Grading Rules:

1. U.S. Product Standard PS 1-83 for Construction and Industrial Plywood.

2. American Plywood Association (A.P.A.).

C. Perform finish carpentry in accordance with AWI Quality Standards, "Custom" grade, unless otherwise noted.

1.05 SUBMITTALS

A. All submissions shall be made in accordance with Section 01300 - Submissions and as modified below.

B. Submit shop drawings and product data for architectural woodwork. Indicate materials, component profiles, jointing details, finishes, and accessories.

1. If requested, provide 6" long samples of trim pieces.

C. LEED Submittals; for projects requiring LEED certification submit the following:

1. Submit recycled content and regional materials documentation for each type of product provided under work of this Section in accordance with Section 01352 "LEED Requirements".

2. Credit EQ 4.1: Manufacturers' product data for interior field-applied construction adhesive, including printed statement of VOC content in accordance with Section 01352 "LEED Requirements".

3. Credit EQ 4.4: Composite wood manufacturer's product data for each composite wood product used indicating that product's bonding agent contains no urea formaldehyde in accordance with Section 01352 "LEED Requirements".

4. *Forest Certification for the following wood products; materials produced from wood obtained from forests certified by a Forest Stewardship Council (FSC)-accredited certification body to comply with FSC 1.2, "Principles and Criteria":*

   a. Finish lumber and moldings.

   b. Finish plywood, veneers.

1.06 DELIVERY, STORAGE AND PRODUCT HANDLING

A. Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels; provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials.

C. Do not deliver finish carpentry materials, until painting, wet work, grinding, and similar operations which could damage, soil, or deteriorate woodwork have been completed in installation areas.

D. Deliver interior finish carpentry only when environmental conditions meet requirements specified for installation areas. If finish carpentry must be stored in other than installation areas, store only where environmental conditions meet requirements specified for installation areas.

1.07 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install interior finish carpentry until building is enclosed and weatherproof, wet work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 - MATERIALS

2.01 SEASONING

A. Moisture Content: Except grades and species having a definite moisture content limitation under established grading rules, lumber shall be kiln-dried to a maximum moisture content of twelve percent (12%).

2.02 EXTERIOR STANDING AND RUNNING TRIM

A. Trim shall be of sizes, configurations, and profiles as indicated on the drawings for the following applications.

   1. Finished lumber.

   2. Door and window casings.

3. Fascia, rake, and associated trim.

4. Other applications as may be detailed on the drawings.

B. Exterior applications shall be clear all-heart redwood, clear heart western red cedar, southern yellow pine, or black locust, unless otherwise noted on the drawings as a different species or resin-based, hardboard, or composite material.

1. Provide WM grade P for opaque/painted finish.

2. Provide WM grade N for natural/stained finish.

2.03 INTERIOR STANDING AND RUNNING TRIM

A. Trim shall be of sizes, configurations, and profiles as indicated on the drawings for the following applications.

1. Finished lumber.

2. Door and window casings.

3. Wall base molding.

4. Chair rails.

5. Crown moldings.

6. Picture moldings.

7. Other applications as may be detailed on the drawings.

B. Interior softwood applications shall be select eastern white pine or sapwood birch; hardwood applications shall be white oak, red oak, or hard maple, unless otherwise noted on the drawings as a different species or resin-based, hardboard, or composite material.

1. Provide WM grade P for opaque/painted finish.

2. Provide WM grade N for natural/stained finish.

2.04 INTERIOR PLYWOOD

A. Exposed finished plywood applications shall utilize furniture-grade plywood of a face species coordinating with specified trim or as indicated on the drawings.

1. Provide Type II interior sound grade for opaque/painted finish.

2. Provide Type II interior grade A for natural/stained finish.

B. Thicknesses shall be as indicated on the drawings.

1. Shelving plywood shall be nominal 3/4" minimum.

C. Comply with PS 1-83. Interior plywood in proximity to water (toilet rooms, sinks, etc.): manufactured with exterior glue.

1. Plywood must contain no urea-formaldehyde resins.

2.05 WINDOW STOOLS & APRONS

A. Window stools shall be constructed of hardwood lumber species as indicated on the drawings. If no species is indicated, bids shall be based upon red oak.

1. Utilize nominal 1" board stock for widths of 7-1/4" or less. For wider applications, utilize nominal 5/4" board stock.

2. Exposed edges shall be bullnosed.

B. Aprons shall be of similar species as window stools and shall be wide enough to cover rough wood blocking or GWB edge transition beneath.

2.06 MISCELLANEOUS MATERIALS

A. Fasteners and Anchorages: Provide nails, screws, and other anchoring devices of the proper types, size, material, and finish for application indicated to provide secure attachment, concealed where possible, and complying with applicable Federal Specifications and reference AWI standard.

PART 3 - EXECUTION

3.01 PREPARATION

A. Condition materials to average prevailing humidity conditions in installation areas prior to installing.

B. Prime and backprime lumber for painted finish exposed on the exterior. Comply with requirements for surface preparation and application in Section 09900 – Painting & Staining.

3.02 INSTALLATION

A. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacturer with respect to surfaces, sizes, or patterns.

B. Product joints which are true, tight, and well nailed with all members assembled in accordance with the Drawings. Field sand all finish trim material smooth, except Cedar, to remove saw marks, raised grain, etc. Cut all corners square and ease slightly.

C. Jointing: Make joints to conceal shrinkage; miter exterior joints; cope interior joints; miter or scarf end-to-end joints. Install trim in pieces as long as possible, jointing only where solid support is obtained.

1. Door and window casings shall be single lengths without splicing.

D. Fastening:

1. Install items straight, true, level, plumb, and firmly anchored in place.

2. Where blocking or backing is required, coordinate as necessary with other trades to ensure placement of required backing and blocking in a timely manner.

3. Nail trim with finish nails of proper dimension to hold the member firmly in place without splitting the wood.

4. Nail exterior trim with galvanized nails, making joints to exclude water.

5. On exposed work, set nails for putty.

E. Prime paint surfaces in contact with cementitious materials or separate with felt.

3.03 INSTALLATION OF OTHER ITEMS

A. Set items at locations shown, in perfect alignment and elevation, plumb, level, straight, true and free from rack, scribed to adjoining work.

B. Appearance: finished surface shall be free of tool marks.

3.04 ADJUSTMENT, CLEANING, FINISHING, AND PROTECTION

A. Keep premises in a neat, safe, and orderly condition at all times during execution of this portion of the work, free from accumulation of sawdust, cut-ends, and debris.

B. Repair damaged and defective finish carpentry work wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.

C. Clean finish carpentry work on exposed and semi-exposed surfaces. Touch up shop applied finishes to restore damaged or soiled areas.

D. Protection: Installer of finish carpentry work shall advise Contractor of final protection and maintain condition necessary to ensure that work will be without damage or deterioration at time of acceptance.

END OF SECTION

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07190 - UNDER SLAB VAPOR BARRIER

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Work specified in this section covers furnishing, delivery, and installation of a vapor barrier under all new interior slabs on grade (horizontal application).

B. Products supplied under this section:

1. Vapor Barrier, seam tape, mastic, pipe boots, detail strip for installation under concrete slabs.

C. Related Sections:

1. Section 03300 – Cast-in-Place Concrete.
2. Section 07200 – Building Insulation

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. ASTM E 1745-17 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

2. ASTM E 1993/E1993M-98 (2013) – Standard Specification for Bituminous Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.

3. ASTM E 154-08a 2a3e1 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs.

4. ASTM E 96-13 Standard Test Methods for Water Vapor Transmission of Materials.

5. ASTM E 1643-11 (2017) Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

B. American Concrete Institute (ACI)

1. ACI 302.2R-06 Vapor Barrier Component (plastic membrane) is not less than 10 mils thick.

1.03 SUBMITTALS

A. Quality Control/Assurance

1. All submissions shall conform to General Conditions Section G31.

2. Full set of test results per paragraph 8.3 of ASTM E 1745.

3. Manufacturer's samples, literature

4. Manufacturer's installation instructions for placement, seaming and pipe boot installation.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Store materials in a clean dry area in accordance with manufacturer's instructions.

C. Stack membrane on smooth ground or wood platform to eliminate warping.

D. Protect materials during handling and application to prevent damage or contamination.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Product not intended for uses subject to abuse or permanent exposure to the elements.

B. Do not apply on frozen ground.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Vapor Barrier: Under typical interior slabs where finished flooring does not involve wood, provide non-woven, polyester, reinforced, polyethylene coated sheet of 15 mil thickness.

1. Vapor Barrier membrane must have the following properties:

a. Permeance as tested after mandatory conditioning (ASTM E 1745 paragraphs 7.1.2-5): less than 0.01 perms (grain/ft²/hr/in-Hg).

b. Other performance criteria:

1. Strength: Class A (ASTM E 1745).

2. Minimum thickness of the plastic retarder material: 15 mils.

c. Basis of Design: Stego Wrap 15-mil Vapor Barrier by Stego Industries LLC.

d. Or Architect approved equal.

B. Vapor Barrier under interior slabs where finished flooring involves wood assemblies such as gymnasiums and stages provide Bituminous Vaporproofing/Waterproofing Membrane

1. Vapor Barrier must be seven-ply, weather-coated, permanently

bonded, semi-flexible bituminous core board composed of a 3-ply plasmatic matrix sealed between liners of asphalt-impregnated felt and a glass mat liner. Vapor Barrier shall consist of an asphalt weather coat and covered with a polyethylene anti-stick sheet. Vapor Barrier shall meet or exceed all requirements of ASTM E 1993-98 and shall have the following characteristics:

a. Minimum Permeance ASTM F1249, calibrated to ASTM E96, Water Method: 0.0011 Perms.

b. Tensile Strength ASTM E154, Section 9: 156 LBS. force.

c. Puncture Resistance ASTM E154: 149 LBS. force/inch.

d. Premoulded Membrane® Vapor Seal with Plasmatic Core by W.R Meadows. W.R. Meadows, Inc., PO Box 338, Hampshire Illinois 60140-0338. (800) 348-5976. (847) 683-4500.Fax (847) 683-4544. website www.wremeadows.com.

2.02 ACCESSORIES FOR TYPICAL POLYESTER-REINFORCED, POLYEHTELENE COATED SHEET

A. Seam Tape

1. Tape must have the following qualities:

a. Water Vapor Transmission Rate ASTM E 96; 0.3 perms or lower.

2. Seam Tape

a. Stego Tape by Stego Industries, LLC or equal.

B. Vapor Proofing Mastic

1. Mastic must have the following qualities:

a. Water Vapor Transmission Rate ASTEM E 96; 0.3 perms or lower.

2. Mastic

a. Stego Mastic by Stego Industries, LLC or equal.

C. Pipe Boots

1. Construct pipe boots from vapor barrier material, pressure sensitive tape and/or mastic per manufacturer’s instructions.

2.03 ACCESSORIES FOR BITUMINOUS VAPORPROOFING/WATERPROOFING MEMBRANE

A. Bonding Asphalt: Sealtight Catalytic Bonding Asphalt.

B. Adhesive: Sealtight Pointing Mastic.

C. Joint Tape: Sealtight PMPC Tape.

D. Pointing Mastic: Sealtight Pointing Mastic.

PART 3 - EXECUTION

3.01 PREPARATION

A. Ensure that subsoil is approved by architect or geotechnical firm.

1. Level and tamp or roll aggregate, sand or tamped earth base.

B. Examine surfaces to receive membrane. Notify Architect if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected.

C. Prepare surfaces in accordance with manufacturers instructions.

3.02 INSTALLATION

A. Install Plastic Film Vapor Barrier/Retarder:

1. Installation shall be in accordance with manufacturer's instructions and ASTM E 1643-98 (2005).

a. Unroll Vapor Barrier/Retarder with the longest dimension parallel with the direction of the pour.

b. Lap Vapor Barrier/Retarder over footings or seal to foundation walls.

c. Overlap joints 6 inches and seal with manufacturer's tape.

d. Seal all penetrations (including pipes) per manufacturer's instructions.

e. No penetration of the Vapor Barrier/Retarder is allowed except for reinforcing steel and permanent utilities.

f. Repair damaged areas by cutting patches of Vapor Barrier/Retarder, overlapping damaged area 6 inches and taping all four sides with tape.

B. Install Bituminous Vaporproofing/Waterproofing Membrane

1. Apply membrane in accordance with manufacturer's instructions to provide a permanent, monolithic vapor seal without voids or open seams.

2. Ensure accessory materials are compatible with membrane and approved by membrane manufacturer.

3. Place membrane in position by Dutch lap method with laps sealed with bonding asphalt.

4. Point exposed edges with pointing mastic to prevent water from traveling under membrane.

5. Place membrane collar around protrusions through concrete slab, including sewer pipes, water pipes and

utility inlets to create a positive seal between protrusions and membrane. Seal in place with joint tape and point around protrusions with pointing mastic.

6. Adhere membrane to vertical surfaces with adhesive.

3.03 PROTECTION

A. Protect all vapor barriers from injury before and during placement of reinforcing and concrete. Check for and repair any puncture before start of concrete placement.

END OF SECTION

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07200 - BUILDING INSULATION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included: Furnish labor, materials, tools, and equipment necessary or required to perform and complete the installation of building insulation as indicated on the drawings and specified herein. This Section includes the following: Rigid board insulation at exterior masonry cavity wall construction and under metal wall panels; Rigid board insulation at perimeter foundation walls; Rigid board insulation at underside of floor slabs; Fibrous blanket insulation for thermal purpose, where indicated; Miscellaneous batt insulation to maintain continuity of building thermal barrier; Protective cover over insulation board prior to placement of backfill or concrete cover.

B. Related Documents: Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

C. Related Sections include the following:

1. Division 4 Section "Unit Masonry" for concrete unit masonry.

2. Division 6 Section "Carpentry Work" for wood framing and supportive construction.

3. Division 7 Section "Firestopping" for fire-stop and smoke-stop materials at voids around penetrations through fire-rated and smoke barrier wall and roof construction assemblies.

4. Division 8 Section "Aluminum Windows" for miscellaneous batt insulation required at periphery of windows.

5. Division 8 Section "Standard Steel Doors and Frames" for miscellaneous batt insulation required at periphery of storefront framing system.

6. Division 9 Section "Gypsum Board Assemblies" for sound attenuation insulation, metal stud and drywall partition construction.

7. Division 9 Section "Suspended Acoustical Ceilings" for ceilings to receive thermal lay-in insulation.

1.02 QUALITY ASSURANCE

A. Standards: Comply with standards specified in this section and as listed in Section 01085.

B. Reference Standards:

1. American Society for Testing and Materials (ASTM):

a. ASTM C177 - Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.

b. ASTM C518 - Steady-State Thermal Transmission Properties by Means of The Heat Flow Meter.

c. ASTM C665 - Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

d. ASTM D1621 - Compressive Properties of Rigid Cellular Plastics.

e. ASTM E84 - Surface Burning Characteristics of building Materials.

f. ASTM E119 - Fire Tests of Building Construction and Materials.

g. ASTM E2178 - 11 Standard Test Method for Air Permeance of Building Materials

h. ASTM E2357 - 11 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies

2. Federal Specifications (FS):

a. FS HH-I-521E - Insulation Blankets, Thermal Fiber, for Ambient Temperatures.

1.03 SUBMISSIONS

A. General: Comply with requirements of Section 01300: Submissions.

B. Product Data: Submit manufacturer's specifications and installation instructions and recommended procedures for application of adhesives for each type of insulation.

C. Certified Test Reports: With product data, submit copies of certified test reports showing compliance with specified performance values, including R-values (aged values for plastic insulations), densities, compression strengths, fire performance, perm ratings, water absorption ratings, and similar properties.

D. Samples for Verification:

a. Submit, to the job site, 6” x 6” samples of each type and thickness of insulation.

b. Submit appropriate sample of loose fill insulation.

c. Submit manufacturer’s verification that rigid insulation contains at least 20% combined post-consumer and post –industrial recycled content.

d. Submit manufacturer’s verification that batt insulation contains at least 30% combined post-consumer and post –industrial recycled content.

e. Submit manufacturer’s verification that cellulose insulation contains at least 85% combined post-consumer and post –industrial recycled content.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Materials shall be delivered in their original, unopened packages or containers; labels shall be intact, identifying contents, manufacturer, brand name, thermal values and applicable standards. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources.

B. Store all materials in a single location protected from weather, moisture, and open flame or sparks.

C. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the work and materials of other trades.

D. Comply with manufacturer's written recommendations for handling, storage, and protection during installation.

E. Warning: Rigid insulation is combustible and may constitute a fire hazard; adequate protection shall be provided in accordance with National Fire Protection Association (NFPA) standards or the authority having jurisdiction.

F. Cover and protect insulation with light colored or white opaque covering while in storage; sunlight causes discoloration and deterioration that impairs adhesive bonding.

PART 2 - PRODUCTS

2.01 INSULATION MATERIALS

A. General: Design is based on insulating materials as specified on drawings. The terminology used may include reference to specific manufacturers' proprietary products. Such reference shall be construed only as establishing the quality of the materials and workmanship to be used under this section and shall not, in any way, be construed as limiting competition.

B. Products used shall be those upon which design is based or shall be equal products approved in advance by the Architect.

C. Materials:

1. Exterior Wall Sheathing Insulation Basis-of-Design: has been specified around standard products as manufactured by Owens-Corning Foam Insulation Corporation, Toledo, OH: compliance with requirements, provide the named product or a comparable product by one of the following: Similar or equal to “Foamular”, rigid closed cell foam panels conforming to ASTM C578. Provide 1/2” thickness at exterior wall locations, typical.

2. Rigid Perimeter and Under Floor Slab Insulation Basis-of-Design: has been specified around standard products as manufactured by The Dow Chemical Company, Construction Materials Group, Midland, MI; Telephone: 1-800-232-2436. Subject to compliance with requirements, provide the named product or a comparable products by one of the following:

    1. Amoco Foam Products Company, Atlanta, GA.
    2. UC Industries, Inc., Parsippany, NJ.

3. Fiberglass Blanket Insulation Basis-of-Design: has been specified around Fiberglas Building Insulation Blankets as manufactured by Owens-Corning Fiberglas Corporation, Toledo, OH. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

    1. CertainTeed Corporation.
    2. Johns Manville Corporation.

4. Suspended ceiling insulation: Owens-Corning Fiberglass 'Sonobatts' unfaced and faced insulation or Architect approved equal – Refer to drawings for types, R-Values and thicknesses.

5. Safing insulation: *Thermafiber* safing insulation or Architect approved equal with VOC content in accordance with Section 01352 *"LEED Requirements"*.

6. Smoke seal compound: *Thermafiber* or Architect approved equal with VOC content in accordance with Section 01352 *"LEED Requirements"*.

7. Nailable Rigid roof insulation board: "*Nailboard*", 3" overall thickness (R-15.9) closed cell polyisocyanurate foam core insulation board with 5/8" thick OSB as manufactured by Johns Manville or Architect approved equal.

    a. Standard board size to be 4' x 8' x 3" thick with an averaged R-Value of 15.9.

    b. Rigid board shall be UL class A fire rated.

    c. OSB must contain no urea-formaldehyde resins.

8. Rigid roof insulation board: "*Energ'y-3*", 1 1/2" (R-10) closed cell polyisocyanurate foam core insulation board as manufactured by *Johns Manville* or Architect approved equal.

    a. Standard board size to be 4' x 8' x 1 1/2" thick with an averaged R-Value of 10.

    b. Rigid board shall be UL class A fire rated.

    c. All rigid board installation shall be in conformance with manufacturer's specifications.

D. Flame Spread & Smoke Developed Rating: All insulation materials shall have a flame spread rating of less than 25 and smoke developed not to exceed 450, in accordance with ASTM E-84.

2.02 MATERIAL REQUIREMENTS

A. Cavity Wall Insulation: *Dow "Styrofoam CAVITYMATE ULTRA INSULATION"*, rigid, extruded cellular polystyrene board conforming to air barrier test requirement ASTM E2178 for a maximum air permeance no greater than 0.004 cfm/ft2 to be used in conjunction with *"GREAT STUFF PRO™ Gaps & Cracks Insulating Foam Sealant"* to create an air barrier system; the air barrier qualities of this system have been tested and meet the requirements of ASTM E2357 and meet all relevant code requirements for infiltration resistance.

1. Thermal Resistance: Aged R-values of 6.0 and 5.6 min. per inch °F-ft2-h/Btu2/inch at 40 °F and 75 °F respectively (ASTM C 518-98), and warranted by manufacturer to retain at least 90% of its original R-value for 15 years.

2. Thickness: As indicated on drawing details.

3. Compressive Strength: Comply with ASTM C 578-95, Type IV, density 1.6 lb/cu. ft. min. compressive resistance 25 psi (ASTM D 1621-94)

4. Water Absorption: Maximum 1% by volume, ASTM C 272-91 (96).

5. Edges: Square.

6. Maximum Flame Spread and Smoke Developed indexes: When tested in accordance with ASTM E84.

   a. Flame Spread: 75.
   b. Smoke Development: 450.

7. Surface Burning Characteristics: When tested in accordance with ASTM C 578-95.

   a. Flame Spread: 0.
   b. Smoke Development: 155.

8. Foam Blowing Agent: Shall provide at least a 90% reduction in ozone depletion potential as compared with CFC's and shall be certified by foam manufacturer.

9. NOTE: Molded "bead board" will not be acceptable.

B. Perimeter and Under Slab Insulation: *Dow "Styrofoam Square Edge"* with same performance characteristics as specified above for cavity wall insulation.

C. Adhesive: *Dow "GREAT STUFF PRO™ Gaps & Cracks Insulating Foam Sealant"*; capable of securely adhering to applicable surface(s) with

VOC content in accordance with Section 01352 *"LEED Requirements"*.

D. Batt / Blanket Insulation:

1. General Thermal Use Insulation: Preformed glass fiber, ASTM C665, Type I, unfaced without integral vapor barrier, friction fit type, 3-1/2" (89mm) thick, with a thermal resistance (R-value) of R-11, unless thickness and R value are noted otherwise.

2. Wall Insulation: Types as called for on the drawings, preformed glass fiber, ASTM C665, Type I, unfaced without integral vapor barrier, friction fit type or ASTM C665, Type II, Class C, with Kraft-faced integral vapor barrier, as indicated on drawings, 6 $^{1}/_{4}$" (159mm) thick, and a thermal resistance (R-value) of R-19, unless thickness and R value noted otherwise.

3. Ceiling Insulation: Preformed glass fiber, ASTM C665, Type I, unfaced without integral vapor barrier, friction fit type, 6 $^{1}/_{4}$" (159mm) thick with a thermal resistance (R-value) of 19; 12" (305mm) thick, and a thermal resistance (R-value) of R-38, unless thickness and R value noted otherwise.

4. Fire-Hazard Classification: When tested in accordance with ASTM E84.

   a. Concealed Installations:
      1. Flame Spread Rating: 25 maximum.
      2. Smoke Development Rating: 50 maximum.

   b. Exposed installations:
      1. Flame Spread Rating: 75 maximum.
      2. Smoke Development Rating: 450 maximum.

5. Cellulose Insulation:

   a. Cellulose Insulation by weight:

      1. Newsprint (Cellulose Fiber): Not less than 85 percent, with a minimum of 80 percent post-consumer recycled paper fiber.
      2. Boric Acid H_3BO_3: Not more than 10%.
      3. Ammonium Sulfate $(NH_4)H_4PO_4$: Not more than 11%.
      4. Guar Gum or Wheat Starch: Not more than 2%.
      5. Mono Ammonium Phosphate $NH_4H_2PO_4$: Not more than 2%.
      6. Zinc Sulfate ZnSO4-H2O: Not more than 2%.

   b. Physical and Chemical Properties:

      1. Bulk Density 9lb/ft^3 compressed.
      2. Appearance: Grey, odorless fiber.
      3. Vapor Pressure Negligible @ 20 degrees C (68 degrees F).
      4. Solubility in Water: Not soluble
      5. Boiling/melting point: Not Applicable
      6. Flash Point Not Applicable
      7. pH: <8.2 (2.0 percent suspension @ 25 degrees C (77 degrees F)
      8. Viscosity: Not Applicable.
      9. Self-supporting and adheres to typical wood, metal gypsum

board and concrete.
10. To contain no asbestos, formaldehyde, mineral wool or fiberglass.
11. Non-corrosive to metals.
12. Fungal Resistant.

E. Staples: Electroplated or galvanized steel wire, type and size as recommended for application.

F. Wire-Up: Utilize 16 or 18 gauge line wire run diagonally or perpendicular to insulation every 18 to 24 inches.

G. Impaling Pin: Utilize impaling pins welded or fastened with adhesive. Impale insulation on anchor and secure with washer.

H. Miscellaneous Batt Insulation: Preformed glass fiber, ASTM C665, Type I, un-faced without integral vapor barrier membrane, field cut to appropriate size and thickness as required or indicated on Contract Drawings.

I. Protective Board Covering: $^1/_8$" thick biodegradable hardboard, $^1/_4$" minimum thickness of wood fiberboard, or other protective covering as approved by the Architect.

2.03 OTHER MATERIALS

A. All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be as selected by the Contractor, subject to the approval of the Architect.

PART 3 - EXECUTION

3.01 INSPECTION, SURFACE PREPARATION AND WORKMANSHIP

A. Carefully examine all the areas and conditions under which work of this section will be installed. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

B. Insure that work of all preceding trades is completed prior to starting work of this Section.

C. Insure surfaces are in uniform plane; true to dimensions; and free of waxes, oily films, grease, loose mortar chips, other items detrimental to installation.

3.02 INSTALLATION

A. Except as otherwise specifically directed by the Architect, install all building insulation in the size and thickness specified, in strict accordance with the manufacturer's instructions.

B. Install rigid insulation to maintain continuous and complete

thermal protection for building spaces and elements.

C. Cut and trim rigid insulation; by means of saw, knife or other sharp tool, to neatly fit spaces and around mechanical, electrical and other items which protrude through plane of insulation. Butt edges and ends tight. Use only rigid insulation free of broken or chipped edges.

D. Installation of Roof Insulation:

1. Verify that surfaces and site conditions are ready to receive work.

2. Verify that deck is supported and secured.

3. Verify that deck is clean and smooth, free of depressions, irregularities, or projections, properly sloped to drains.

4. Verify that deck surfaces are dry and free of dirt and debris. (Verify flutes of metal deck are clean and dry).

5. Verify that roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set and [wood cant strips] [wood nailing strips] [and reglets] are in place.

6. Start of work means installer accepts existing [surfaces] [substrate].

7. Protect building surfaces against damage from roofing work.

8. Verify that metal deck units are properly secured in place.

E. Installation of Rigid Cavity Wall Insulation:

1. Install insulation horizontally and continuously to wall construction.

2. Secure rigid insulation in place with adhesive using spot or ribbon method in accordance with insulation manufacturer's written instructions.

3. Stagger vertical joints of insulation, except free ends over line or control joints.

4. Apply 2” diameter daubs of adhesive space approximately 12” o.c. vertically and horizontally on inside face of insulation board.

5. Butter all edge joints of insulation board with adhesive to provide continuous vapor barrier.

6. Fit insulation between wall ties and other obstructions with joints staggered and edges butted tightly.

   a. Press units firmly against inside wythe of masonry or other construction.
   b. Wedge insulation from outside wythe of construction with small fragments of masonry materials space 24” o.c. both ways.
   c. Make insulation continuous. Fill all voids.

7. Comply with insulation manufacturer’s written instructions applicable to products and applications indicated.

8. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

9. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

F. Installation of Perimeter Insulation:

1. Secure rigid insulation on perimeter foundation wall with adhesive, using "spot or ribbon method", in accordance with the insulation manufacturer's recommendations.

2. Place insulation horizontally and install continuously.

3. Stagger vertical joints of insulation, except free ends over line of control joints.

4. Extend insulation down below finish grade 48" or to top of footing, whichever is less, unless noted or indicated otherwise.

5. Do not allow insulation to be displaced during backfilling operation.

6. Immediately following application of insulation boards, place protective board covering over exposed insulation surfaces and adhesive secure boards in accordance with manufacturer's instructions. Install boards horizontally or vertically from base of insulation to top of insulation. Butt board joints tight, stagger from insulation joints.

G. Installation - Under Slab on Grade:

1. Place rigid insulation under slabs on grade after base for slab on grade has been compacted.

2. Extend insulation in 24" from the outside edge of slab unless noted or indicated otherwise.

3. Prevent insulation from being displaced or damaged while placing vapor barrier and pouring slabs.

H. Installation of Batt / Blanket Insulation:

1. Install unfaced batt/blanket insulation in accordance with manufacturers instructions, friction fitted between framing members in walls, ceilings and floors.

2. Install faced batt/blanket insulation in accordance with manufacturers instructions, with facing having formed flanges at the edges for either face or inset stapling at maximum 6" o.c. or taping to framing members. Install factory applied vapor-retarding membrane facing warm side of building spaces.

3. Install insulation without gaps or voids, lapping ends and side flanges. Do not compress insulation.

4. Trim insulation neatly to fit tight in spaces and tight to exterior side of mechanical and electrical services within the plane of the insulation.

5. Tape seal butt ends, lapped flanges, and punctures, tears and cuts in membrane.

I. Installation of Miscellaneous Batt Insulation:

1. Coordinate with other Sections and install fibrous insulation around exterior doorframes, window frames, roof expansion joints, roof and wall penetrations, and other voids to maintain continuity of building thermal barrier.

2. Insulate all miscellaneous gaps or voids to maintain thermal continuity of building.

3.03 CLEAN-UP

A. Do not permit insulation debris to accumulate in building or on job site.

B. Upon completion of work, leave premises clean, free from scraps and debris.

3.04 PROTECTION

A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

3.05 VERIFICATION

A. Upon completion of the installation in each area, visually inspect and verify that all insulation is complete and properly installed.

END OF SECTION

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

SECTION 07271-SELF-ADHERED NON-PERMEABLE AIR BARRIER MEMBRANE

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. General Conditions, Supplementary Conditions, Instructions to Bidders and Division One General Requirements shall be read in conjunction with and govern this section.

B. This Specification shall be read as a whole by all parties concerned. Each Section may contain more or less than the complete Work of any trade. The Contractor is solely responsible to make clear to the Subcontractors the extent of their Work.

1.02 DESCRIPTION

A. Supply labor, materials and equipment to complete the Work as shown on the Drawings and as specified herein to bridge and seal the following air leakage pathways and gaps:

1. Connections of the walls to the roof air barrier.
2. Connections of the walls to the foundations.
3. Seismic and expansion joints.
4. Openings and penetrations of window and door frames, store front, curtain wall.
5. Piping, conduit, duct and similar penetrations.
6. Masonry ties, screws, bolts and similar penetrations.
7. All other air leakage pathways in the building envelope.

B. Materials and installation methods of the primary air/vapor barrier membrane system and accessories.

C. Materials and installation methods of through-wall flashing membranes.

1.03 RELATED SECTIONS

1. 03300 – Cast-In-Place Concrete
2. 04200 – Unit Masonry
3. 05400 – Cold Formed Metal Framing
4. 06100 – Rough Carpentry
5. 06164 – Gypsum Sheathing
6. 07200 – Building Insulation
7. 07231 – Air / Vapor Barrier System
8. 07602 – Flashing
9. 07900 – Caulking
10. 07910 – Joint Sealers
11. Division 7 Section "Roofing” requirement for coordination sequencing of membrane roofing; requirement to seal roof membrane to wall air barrier.
12. Division 8 Section "Aluminum Windows" for window units at the periphery of the building.

13. Division 8 Section "Glazed Aluminum Curtain Walls”

1.04 REFERENCES

A. The following standards are applicable to this section:

1. ASTM E2357: Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.

2. ASTM E2178: Standard Test Method for Air Permeance of Building Materials.

3. ASTM E283: Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

4. E1677 Specification for Air Retarder (AR) Material or System for Low-Rise Framed Building Walls.

5. ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

6. ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.

7. ASTM E96: Water Vapor Transmission of Materials.

8. CGSB 37-GP-56M: Membrane, Modified, Bituminous, Prefabricated, and Reinforced.

1.05 SUBMITTALS

A. General: Comply with requirements of Section 01300: Submissions.

B. Submit documentation from an approved independent testing laboratory certifying the air leakage and vapor permeance rates of the air barrier membranes, including primary membrane and transition sheets, exceed the requirements of the Massachusetts Energy Code and in accordance with ASTM E2178.

1. Test report submittals shall include test results on porous substrate and include sustained wind load and gust load air leakage results.

C. Submit copies of manufacturers’ current ISO certification.

D. Submit manufacturers’ current product data sheets for the air barrier membrane system.

1.06 QUALITY ASSURANCE

A. Submit document stating the applicator of the primary air/vapor barrier membranes specified in this section is qualified by the manufacturer as suitable for the execution of the Work.

B. Perform Work in accordance with manufacturer's written instructions and this specification.

C. Maintain one copy of manufacturer's written instructions on site.

D. Allow access to Work site by the air barrier membrane manufacturer's representative.

E. Components used shall be sourced from one manufacturer, including sheet membrane, air barrier sealants, primers, mastics, and adhesives.

F. Single-Source Responsibility:

1. Obtain air barrier materials from a single manufacturer regularly engaged in manufacturing the product.

2. Provide products which comply with all state and local regulations controlling use of volatile organic compounds (VOCs).

1.07 MOCK-UP

A. Construct mock-up in accordance with Section 04200.

B. Where directed by architect, construct typical exterior wall panel, 6 foot long by 6 foot wide, incorporating substrate, window frame, attachment of insulation and showing air barrier membrane application details.

C. Mock-up to be reviewed and approved by architect before proceeding with air barrier work. Mock-up may remain as part of the Work.

D. Test mock-up for air and water infiltration to conform with Quality Control, in accordance with ASTM E 783 and ASTM E1105.

1.08 PRE-INSTALLATION CONFERENCE

A. Pre-installation conference shall convene prior to commencing of work of this section.

B. Ensure all contractors responsible for creating a continuous plane of air tightness are present.

1.09 DELIVERY, STORAGE AND HANDLING

A. Refer to current Product MSDS for proper storage and handling.

B. Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.

C. Store role materials on end in original packaging. Protect rolls from direct sunlight until ready for use.

D. Store air barrier membranes, adhesives and primers at temperatures of 40°F and rising.

E. Keep solvent away from open flame or excessive heat.

F. Wasted Management and Disposal.

1. Separate and recycle all waste materials.

1.10 COORDINATION

A. Ensure continuity of the air seal throughout the scope of this section.

1.11 ALTERNATES

A. The Contractor shall consult the "Bid Proposal Form" and read all alternates and assure himself whether or not they will add to, deduct from, or in any way affect the cost of the work under this section of the specifications. He shall include all such applicable alternates in his proposal.

B. Alternate submission to include:

1. Evidence that alternate materials meet or exceed performance characteristics of Product requirements as well as documentation from an approved independent testing laboratory certifying the air leakage rates and vapor permeance rates of the air barrier membranes, including primary membrane and transition sheets, exceed the requirements of the Building Code of New York State Energy Code and in accordance with ASTM E2178.

2. Copies of the manufacturer’s current ISO certification.

3. Ten (10) references clearly indicating the membrane manufacturer has successfully completed projects of similar scope and nature for a minimum of ten (10) years.

4. Manufacturer’s complete set of details for air barrier membrane system showing a continuous plane of air tightness throughout the building envelope.

1.12 WARRANTY

A. Provide manufacturer’s standard 10-year material warranty.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Air/vapor barrier membrane components and accessories must be obtained as a single-source from the membrane manufacturer to ensure total system compatibility and integrity.

1. Acceptable Manufacturer:

Henry Company
999 N Sepulveda Blvd, Suite 800
El Segundo, CA 90245
(800) 598-7663
www.Henry.com

B. Manufacturer's Standard Products indicated within this section are to establish a level of quality. Equivalency is permitted in accordance with General Municipal Law.

2.02 MEMBRANES (BASIS-OF-DESIGN)

A. Primary sheet air/vapor barrier membrane shall be Blueskin® SA manufactured by Henry; an SBS modified bitumen, self-adhering sheet membrane complete with a blue engineered thermoplastic film. For application temperatures down to 10 degrees F use Blueskin® SA LT. For in service temperatures up to 180 degrees F, use Blueskin® SA HT. Membrane shall have the following physical properties:

1. ASTM E2357: Standard Test Method for Determining Air Leakage of Air Barrier Assemblies,

2. Air leakage: <0.0001 CFM/ft² @1.6 lbs/ft² to ASTM E2178 and ASTM E283 and have no increased air leakage when subjected to a sustained wind load of 10.5 lbs/ft² for 1 hour and gust wind load pressure of 62.8 lbs/ft² for 10 seconds when tested at 1.6 lbs/ft² to ASTM E331,

3. Vapor permeance: 0.03 perms to ASTM E96 (Desiccant Method),

4. Membrane Thickness: 0.0394 inches (40 mils),

5. Low temperature flexibility: -22 degrees F to CGSB 37-GP-56M,

6. Elongation: 200% to ASTM D412-modifed,

7. Meets CAN/CGSB-51-33 Type I Water Vapor Permeance requirements.

B. Primary sheet air/vapor barrier membrane shall be Blueskin® SA HT manufactured by Henry; an SBS modified bitumen, self-adhering sheet membrane complete with a blue engineered thermoplastic film for use in service temperatures up to 180 degrees F, use Blueskin® SA HT. Membrane shall have the following physical properties:

1. ASTM E2357: Standard Test Method for Determining Air Leakage of Air Barrier Assemblies,
2. Air leakage: <0.0001 CFM/ft² @1.6 lbs/ft² to ASTM E2178 and ASTM E283 and have no increased air leakage when subjected to a sustained wind load of 10.5 lbs/ft² for 1 hour and gust wind load pressure of 62.8 lbs/ft² for 10 seconds when tested at 1.6 lbs/ft² to ASTM E331,

3. Vapor permeance: 0.03 perms to ASTM E96 (Desiccant Method),

4. Thermal Stability 203F to ASTM D 1204

5. Compound Stability 212F to ASTM D 5147

6. Elongation: 200% to ASTM D412-modifed,

C. Alternate self-adhering membrane for all window and window sill flashings, door openings, inside and outside corners and other transitions shall be HE200 AM Metal Clad manufactured by Henry; a SBS modified bitumen, self-adhering sheet membrane complete with surface layer of metallic aluminum film that many sealants adhere well to. Membrane shall have the following physical:

1. Peel Adhesion to Primed Steel 15.0 to ASTM D 1000

2. Vapor Permeance: < 0.014 perms to ASTM E 96

3. Membrane Thickness: 0.0443 inches (45 mils)

4. Low temperature flexibility: -15 degrees F to ASTM D146 min

5. Elongation: 40% to ASTM D412-modifed min

D. Through-wall flashing membrane (Self-Adhering) shall be Blueskin® TWF manufactured by Henry; an SBS modified bitumen, self-adhering sheet membrane complete with a yellow engineered thermoplastic film. Membrane shall have the following physical properties:

1. Membrane Thickness: 0.0394 inches (40 mils),

2. Film Thickness: 4.0 mils,

3. Flow (ASTM D5147): Pass @ 212 degrees F,

4. Puncture Resistance: 134 lbf to ASTM E 154,

5. Tensile Strength (film): 5000 psi minimum ASTM D 882,

6. Tear Resistance: 45lbs.-MD, 17lbs.-CD to ASTM D1004,

7. Low temperature flexibility: -22 degrees F to CGSB 37-GP-56M

2.05 PRIMER

A. Primer for self-adhering membranes at temperatures above 25 degrees F shall be Aquatac™ Primer manufactured by Henry; a polymer emulsion based adhesive, quick setting. Primer shall have the following physical properties:

1. Color: Aqua,
2. Weight: 8.7 lbs/gal,
3. Solids by weight: 53%,
4. Water based, no solvent odors,
5. Drying time (initial set): 30 minutes at 50% RH and 70 degrees F

B. Adhesive for self-adhering membranes at all temperatures shall be Blueskin® Adhesive manufactured by Henry, a synthetic rubber based adhesive, quick setting, having the following physical properties:

1. Color: Blue,
2. Weight: 6 lbs/gal,
3. Solids by weight: 35%,
4. Drying time (initial set): 30 minutes

C. Adhesive with low VOC content for self-adhering membranes at all temperatures shall be Blueskin® LVC Adhesive manufactured by Henry, a synthetic rubber based adhesive, quick setting, having the following physical properties:

1. Color: Blue,
2. VOC: <240 g/L,
3. Solids by weight: 40%,
4. Drying time (initial set): 30 minutes

2.06 PENETRATION AND TERMINATION SEALANT

A. Termination Sealant shall be HE925 BES Sealant manufactured by Henry; a moisture cure, medium modulus polymer modified sealing compound having the following physical properties:
1. Compatible with sheet air barrier, roofing and waterproofing membranes and substrate,
2. Complies with Fed. Spec. TT-S-00230C, Type II, Class A,
3. Complies with ASTM C 920, Type S, Grade NS, Class 25,
4. Elongation: 450 – 550%,
5. Remains flexible with aging,
6. Seals construction joints up to 1 inch wide

2.05 INSULATION ADHESIVE

A. Insulation adhesive shall be Air-Bloc 21 Insulation Adhesive manufactured by Henry; a synthetic, trowel applied, rubber based adhesive, having the following physical properties:

1. Compatibility: With air barrier membrane, substrate and insulation,
2. Air leakage: 0.0026 CFM/ft^2 @ 2.1 lbs/ft^2 to ASTM E283,
3. Water vapor permeance: 0.03 perms to ASTM E96,
4. Long term flexibility: CGSB 71-GP-24M.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions are ready to accept the Work of this section. Notify [engineer] [architect] [consultant] in writing of any discrepancies. Commencement of the work or any parts thereof shall mean acceptance of the prepared substrates.

B. All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants. Fill spalled areas in substrate to provide an even plane. Strike masonry joints flush.

C. Where curing compounds are used they must be clear resin based without oil, wax or pigments.

D. Do not proceed with application of air barrier membrane when rain is expected within 24 hours.

E. Condition materials to room temperature prior to application to facilitate handling.

3.02 SURFACE PREPARATION

A. Surfaces must be sound, clean and free of oil, grease, dirt, excess mortar or other contaminants. Fill spalled areas in substrate to provide an even plane.

B. New concrete should be cured for a minimum of 14 days and must be dry before air/vapor barrier membranes are applied.

C. Ensure all preparatory Work is complete prior to applying primary air/vapor barrier membrane.

D. Mechanical fasteners used to secure sheathing boards or penetrate sheathing boards shall be set flush with sheathing and fastened into solid backing.

E. Apply primer at rate recommended by manufacturer to all areas to receive self-adhering sheet air/vapor barrier membrane and or through-wall flashing membrane as indicated on drawings by roller or spray and allow minimum 30 minute open time. Primed surfaces not covered by self-adhering membrane or self-adhering through-wall flashing membrane during the same working day must be re-primed.

3.03 INSTALLTION OF AIR BARRIER SYSTEM

A. INSIDE AND OUTSIDE CORNERS

1. Seal inside and outside corners of sheathing boards with a strip of self-adhering air/vapor barrier membrane extending a minimum of 3 inches on either side of the corner detail.

a. Prime surfaces as per manufacturers' instructions and allow to dry.

b. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 2 inches overlap at all end and side laps of membrane.

c. Roll all laps and membrane with a counter top roller to ensure seal.

B. TRANSITON AREAS

1. Tie-in to structural beams, columns, floor slabs and intermittent floors, parapet curbs, foundation walls, roofing systems and at the interface of dissimilar materials as indicated in drawings with self-adhering air/vapor barrier membrane.

a. Prime surfaces as per manufacturers' instructions and allow to dry.
b. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Provide minimum 3 inch lap to all substrates.
c. Ensure minimum 2 inch overlap at all end and side laps of membrane.
d. Roll all laps and membrane with a counter top roller to ensure seal.

C. WINDOWS AND ROUGH OPENINGS

1. Wrap rough openings with self-adhered air/vapor barrier membrane as detailed.

a. Prime surfaces as per manufacturers' instructions and allow to dry.
b. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 2 inch overlap at all end and side laps of membrane.
c. Roll all laps and membrane with a counter top roller to ensure seal.

D. THROUGH-WALL FLASHING MEMBRANE

1. Apply through-wall flashing membrane along the base of masonry veneer walls and over shelf angles as detailed.

a. Prime surfaces and allow to dry, press membrane firmly into place, over lap minimum 2 inches at all end and side laps. Promptly roll all laps and membrane to ensure the seal.

b. Applications shall form a continuous flashing membrane and shall extend up a minimum of 8 inches up the back-up wall.

c. Seal the top edge of the membrane where it meets the substrate using termination sealant. Trowel-apply a feathered edge to seal termination to shed water.

d. Install through-wall flashing membrane and extend 1/2 inch from outside edge of veneer. Provide end dam flashing as detailed.

E. PRIMARY AIR BARRIER

1. Apply self-adhering air/vapor barrier membrane complete and continuous to prepared and primed substrate in an overlapping shingle fashion and in accordance with manufacturer's recommendations and written instructions. Stagger all vertical joints.

a. Prime surfaces as per manufacturers' instructions and allow to dry.

b. Align and position self-adhering air/vapor barrier membrane, remove protective film and press firmly into place. Ensure minimum 2 inch overlap at all end and side laps of membrane.

c. Roll all laps and membrane with a counter top roller to ensure seal.

d. At the end of each days work seal the top edge of the membrane where it meets the substrate with termination sealant. Trowel apply a feathered edge to seal termination and shed water.

3.04 FIELD QUALITY CONTROL

A. Make notification when sections of Work are complete to allow review prior to covering air/vapor barrier system.

3.05 INSTALLATION OF INSULATION

A. Coordinate with Cavity Wall Insulation Section 07200 for insulating materials.

B. Apply insulation adhesive in a serpentine pattern over the air barrier membrane.

1. Dab Method: Apply walnut-sized dabs of insulation adhesive spaced 6 inches on center to substrate. Apply insulation using sufficient hand pressure to compress dabs up to 2 inches in diameter.

2. Bead Method: Apply ¼ inch beads 6 inches on center in a serpentine pattern.

C. Immediately embed insulation into the adhesive and press firmly into place to ensure full contact. Apply additional adhesive if allowed to skin over.

3.06 PROTECTION

A. Damp substrates must not be inhibited from drying out. Do not expose the backside of the substrate to moisture or rain.

B. Cap and protect exposed back-up walls against wet weather conditions during and after application of membrane.

C. Air/vapor barrier membrane is not designed for permanent exposure. Good practice calls for covering as soon as possible.

END OF SECTION

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07530 – EPDM ROOFING SYSTEM (FULLY ADHERED)

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Extent of Work:

1. Provide and install modified E.P.D.M. system where shown on the drawings and specified herein. Work shall include, but not be limited to the following:

   a. Furnish and install EPDM roofing system with flashings and all other incidental and accessory items to comprise a complete roofing system.

   b. Removal and disposal of existing roofing and insulation to the depths as shown on the Contract Drawings or as required for the new installations.

   c. Installation of New vapor barrier to the existing deck.

   d. Installation of New tapered roof insulation as indicated on drawings.

   e. New single-ply, thermoset roof system, 60 mil reinforced EPDM sheet system, fully adhered membrane.

   f. New wall and base flashing, expansion joints.

   g. Cleaners, adhesives, sealants, seaming tapes, tape primers and fasteners.

   h. Flashing of all new roof penetrations.

   i. New primary roofing manufacturer’s gravel stops, wall copings and/or counter flashing and termination bars.

   j. Miscellaneous sheet metal or metal flashing.

   k. Provision and installation of new drains, connecting piping, and insulation where indicated.

   l. Manufacturer's Guarantee.

   m. New wood blocking and anchor bolts around roof perimeter, roof penetrations, and similar locations, as required for the complete installation of the roofing system, and to meet new perimeter edge heights.

   n. Installation of new equipment curbs where indicated.

o. Walkways where indicated.

p. Provision of new tapered cants as required to meet new blocking at perimeter edges.

q. Raising roof hatches as required to 8" above finish roof, as a result of the work required to raise finished roof surfaces.

r. Raising skylights as required to 8" above finish roof, as a result of the work required to raise finished roof surfaces.

s. Plumbing, mechanical or electrical modifications as required for completion of the installation.

t. Re-securement of roof decking as required by the contract documents.

B. Related Work/Requirements Specified Elsewhere:

1. Section 01020 – Allowances (if incorporated)

2. Section 06100 - Rough Carpentry – for wood nailers, cants, curbs and blocking.

3. Section 07600 - Flashing and Sheet Metal – for metal roof penetration flashings, flashings and counterflashings.

4. Section 07900 - Caulking and Sealants

1.02 GENERAL

A. The intention of this specification is to outline the entire roofing project, describing materials, methods, job conditions, etc., so that during the entire construction period, a complete watertight condition is maintained, and at completion, a new roofing system shall be installed.

B. The Instructions to Bidders, the General Conditions of the Contract for the Construction for Buildings prepared by the American Institute of Architects, the Supplementary General Conditions, and the General Requirements are part of this specification whether bound herewith or not, and the Contractor shall refer to them for instruction pertaining to his work.

1.03 ALTERNATES

A. Where so indicated the Contractor shall consult the "Bid Proposal Form" and read all alternates and assure himself whether or not they will add to, deduct from, or in any way affect the cost of the work under this section of the specifications. He shall include all such applicable alternates in his proposal.

1.04 REFERENCE STANDARDS

A. General: References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards are deemed mandatory and applicable to the Work.

B. Factory Mutual (FM) Engineering Corporation, Norwood, MA - Roof Assembly Classifications.

C. Building Code of New York State

D. FS HH-I-526 - Insulation Board, Thermal (Mineral Fiber).

E. FS HH-I-529 - Insulation Board, Thermal (Mineral Aggregate).

F. FS HH-I-530 - Insulation Board, Thermal (Urethane).

G. FS HH-I-551 - Insulation Block and Boards, Thermal (Cellular Glass).

H. FS LLL-I-535 - Insulation Board, Thermal (Cellulosic Fiber).

I. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual.

J. Underwriters Laboratories (UL), Northbrook, IL - Fire Hazard Classifications.

K. Sheet Metal and Air-Conditioning Contractors National Association, Inc., Chantilly, VA (SMACNA).

L. CGSB 37GP56M Classification: Type 2, Class C, Grade 1.

M. American Society for Testing and Materials (ASTM)

N. Occupational Safety and Health Administration (OSHA), Washington, DC

O. Polyisocyanurate Insulation Manufacturers Association (PIMA) – Bethesda, Maryland – Average Weighted R-Values of roof insulation products.

P. Single Ply Roofing Industry (SPRI), Waltham, MA – Wind Design Standard for Edge Systems Used in Low Slope Roofing Systems.

1.05 PERFORMANCE REQUIREMENTS

A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

C. Jobsite Safety: Execute all operations and provide a safe work environment in accordance to OSHA standards and regulations. This requirement applies to all contractor personnel, associated subcontractors, workers in other trades, and jobsite visitors.

1. Follow all industry fire prevention guidelines for storage of materials, staging areas, roof access, and application means and methods.

2. Any applicable local fire codes supersede industry guidelines.

D. Wind Loads: Provide a roof system, including anchorage, capable of withstanding wind-load design pressures calculated according to requirements of the 2015 International Building Code or the American Society of Building Engineers' ASCE7, "Minimum Design Loads for Buildings and Other Structures," 6.4.2, "Analytical Procedure," whichever is more stringent. **Refer to drawings for Wind Design Data.**

E. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in FMG's "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.

1. Fire/Windstorm Classification: Class 1A-105.

2. Hail Resistance: MH.

1.06 SYSTEM DESCRIPTION

A. For the purposes of this specification, the roofing system has been based upon products manufactured by *Johns Manville Roofing Systems Group, Denver CO* or as approved equal by the Architect.

B. System Description:

Vapor barrier, tapered insulation, cover board, and a single ply membrane system. Include all required pre-manufactured copings, gravel stops, and flashings and blocking as required, to provide complete roofing system warranty, whether detailed on the drawings or not.

1.07 SUBMITTALS

A. Comply with the requirements of Section 01300 – Submissions, and as

modified below. All submittals shall be submitted prior to the Pre-Installation Conference.

B. Manufacturer's Product Data sheets and installation instructions on all materials proposed for use. This shall include catalogue sheets, specifications, and installation instructions for each material specified. Submit an intent to warrant, executed by an authorized representative of system manufacturer, indicating that the manufacturer has reviewed drawings, specifications and conditions affecting the work and, and proposes to provide warranties as referenced herein without further stipulation.

C. Manufacturer’s Warranty: Submit a sample copy of the membrane manufacturer's standard 20 year No Dollar Limit roofing warranty, covering workmanship and materials.

D. U.L., F.M. and S.P.R.I Compliance Data: Contact roofing manufacturer for information.

E. Shop drawings indicating setting plan for tapered insulation. (Field verify exact location of drains prior to submittal). Submit an accurate layout of the tapered insulation, designed and provided by the membrane manufacturer, showing all slopes to drains. Show cross section drawings illustrating the location and thickness of the tapered insulation pieces and filler pieces; show the thickness of the insulation system at high and low points.

1. Where there is a proposed deviation from the Contract Documents, submit the revised detail labeled as such for approval. On the revised detail, show existing conditions and referenced directly to the related details on the Contract Drawings.

2. Submit an accurate layout of the wood nailers showing their required locations, and required spacing between nailers. Show the direction of the felt run in relation to the slope of the deck and the wood nailers.

F. Samples: All submitted samples must be labeled and supplied by the manufacturer for each submittal package. Submit:

(2) Two 12-inch square samples of membrane illustrating the color and thickness to be used;

(2) Two 12-inch samples of each roofing membrane type to be used;

(2) Two 12-inch samples of all proposed tapered insulation to be used;

(2) Two 12-inch samples of all proposed cover-boards to be used;

(2) Two samples of each type of fastener proposed to be used.

G. Submit a copy of the manufacturer's installation instructions.

H. Specified roof drain.

I. Shop drawings indicating proposed configuration of perimeter blocking and fastening, if different than that as shown on the Contract Documents.

   a. Complete configuration of existing roof indicating layout of membrane sheets, seams between sheets, and location and type of all roof penetrations.

   b. Complete details for attaching membrane at perimeter of roof, flashing of roof penetrations, blocking configurations, and other special details as required. This shall include, but not be limited to pre-manufactured gravel stops and copings. Note: Field-fabricated gravel stops and copings will not be permitted.

   c. Complete layout of all tapered insulation indicating compliance with drainage patterns as shown on the drawings.

J. Submit list of at least ten (10) successfully completed roofing projects using each of the EPDM roofing systems proposed for use in this project. Include name, address, and telephone number of Owner's representatives. Identify square footage of total installation for each project listed.

   1. If the above list of completed projects was not installed by the applicator, submit an additional list of at least four completed EPDM roofing projects installed by the applicator. Include name, address, and telephone number of Owner's Representative.

K. Certifications:

   1. **All potential bidders shall submit notarized certification letters from the roofing manufacturer's main corporate offices indicating that the bidder has a minimum of five (5) years previous experience in the specific roofing system applications specified herein, and will provide a list of acknowledged projects to verify same. The contractor must be approved by the roofing system manufacturer for the installation of the primary roofing materials indicated, including membrane and flashing.**

   2. Submit certification that roofing systems installed as part of this project comply with the specifications and installation instructions of the roofing system manufacturer.

   3. Submit letter from roofing system manufacturer indicating that insulation has been approved by the roofing system manufacturer for use with the roofing system.

   4. Submit letter of certification from roofing manufacturer that the specified EPDM systems have been designed to satisfy the specified wind uplift criteria.

   5. Submit letter of certification from the Contractor's NYS

certified Structural Engineer that the proposed blocking and fastening systems have been designed to satisfy the specified wind uplift criteria necessary to carry the specified roofing system warranty.

1.09 QUALIFICATIONS

A. Applicator's Qualifications:

1. **Roofing applicator must be approved by the manufacturer prior to the bidding period and throughout the installation and able to present a copy of his certification as a part of the bid qualifications package required by this contract. This certification must be an original document as prepared directly by the manufacturer's corporate offices, specific for this contract. Submit certifications from manufacturer pursuant to 1.06Kb above.**

2. **Roofing applicator must have installed and successfully completed at least (10) ten roofs of the same materials and methods specified for this project, completed over the last five (5) years. Submit certifications from manufacturer pursuant to 1.07J above.** (List last ten such jobs within 50 miles of the job site, including address, type of system and number of plies, if applicable, square footage, date installed and owner/agent with whom contracted)

3. **The selected bidder must be a single firm specializing in the types of roofing required, providing undivided responsibility for the performance of all component parts of the roofing system.**

4. **The contractor must be approved by the roofing system manufacturer for the installation of the primary roofing materials indicated, including membrane and flashing, and his firm must be in continuous operation of installing such roofing systems for two years or more.**

5. **The contractor must have at least five (5) years of manufacturer-certified experience in installing commercial scale EPDM roofing systems as required by this specification.**

6. **The contractor must employ roofing application foremen who have successfully completed all training offered by roofing systems manufacturer, including schools, seminars, etc. Provide a letter certifying that the job foreman or crew chief and at least one other member of the roofing crew have installed at least similar systems and are thoroughly familiar with all aspects of the installation. Installation of a minimum of five roofs of comparable size, scope, and complexity as the Work of this Section of roofing system specified in the Contract Documents, for which this individual served as field foreman in direct, responsible**

charge of all roofing work crews. (List last five such jobs within 50 miles of the job site, including address, type of system and number of plies, if applicable, square footage, date installed and owner/agent with whom contracted).

7. **Should the successful contractor opt to utilize the services of a subcontractor for any installations under this contract, the subcontractor shall also meet all requirements of experience and qualifications listed herein required for the Prime Contractor.** Note: No more than 25% of the required installations shall be made by manufacturer-certified subcontractors to the Prime Contractor, in conformance with the Instructions to Bidders section of the Project Manual.

8. Contractor's Required Closeout Submittals: The Contractor shall submit a final invoice for the project, as well as close-out of any and all open change orders. He shall include all final waivers of liens from all material suppliers and subcontractors. (Refer to Section 01700 for additional information.) Provide a completed punch list certification by the Contractor and the Owner's Representative.

B. Manufacturer's Qualifications:

1. The roofing system manufacturer must have a minimum of 10 years experience in the manufacture of EPDM vulcanized thermal-set membranes.

2. **For the work of this contract, the roofing system manufacturer must provide a factory-trained and factory-authorized field representative/technician, employed by the roofing system manufacturer, to supervise this project via a minimum of 10 on site visits, and to review installation procedures and advise applicator on procedures and precautions in use of roofing materials required for final inspection of the roofing system. The cost of this manufacturer's representative, and costs incurred for the supply of same, shall be considered inclusive within the contractor's Base Bid for this project. No exceptions will be made for this requirement. Work shall not begin on this project until this representative has arrived to the project, inspected it, and authorized for work to start. The manufacturer's representative shall sign-in upon each visit with the Construction Manager or designated owners representative, so that accurate attendance records can be kept. The intent of the site visits is that the manufacturer's representative will ensure the quality of the preparation and application of the roof system. The representative will inspect the project on a periodic basis to anticipate problems before they occur, answer questions quickly and look out for the best interest of the Owner. The manufacturer's representative will issue a written inspection report for each visit to be issued to the Owners Representative,**

Architect & Contractor.

3. The roofing system manufacturer must provide a NDL warranty (See paragraph 1.13-"Warranty") upon satisfactory installation of the roofing system.

4. All roofing work, including terminations and other work covered under the roofing manufacturer's NDL Guarantee shall be performed by the Prime Contractor. No subcontractors will be permitted on this portion of the work.

1.10 REGULATORY REQUIREMENTS

A. Conform to applicable codes for roof assembly fire hazard requirements.

B. Factory Mutual Engineering and Research Corporation (FM):

1. Roof assembly classification of Class 1 Construction, wind uplift requirements as listed below.

a. Wind Uplift Certification: Submit a Letter from the manufacturer of the roofing system that all products manufactured by them including the specific insulation, adhesives and/or fasteners, are included in the specified Wind Uplift Performance: Roofing system shall be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7 for a **120 MPH three (3) second wind gust**.

b. All products shall be listed as Factory Mutual-certified a minimum of one (1) year prior to the date of installation. Submit certifications for both base and top plies as a part of the submittals required for this project.

c. Material Certification: Written certification from the roofing manufacturer certifying that the insulation, insulation fasteners, flashings and accessory products provided by the roofing manufacturer are approved for use with the roofing system and are included in the 20-year No Dollar Limit warranty.

2. Contact roofing manufacturer's technical representative for additional information.

C. Underwriters Laboratories, Inc. (UL):

1. Class A Fire Hazard Classification.

D. Insulation Criteria:

1. Polyisocyanurate foam insulation shall bear a label certifying that a thermal value was determined in accordance with ASTM C-1289-01.

2. Insulation supplied shall be acceptable to the membrane manufacturer.

E. ANSI/SPRI Wind Design Standard for Edge Systems Used in Low Slope Roofs - All roof edge systems shall comply with the requirements of ANSI/SPRI System Requirement ES1-98 Wind Design Standards Test RE-3. The Contractor shall supply written confirmation of this compliance stating that the roof edge system materials:

1. Exceed 75 lbs./lf outward load in accordance with ANSI/SPRI ES1-98 Wind Design Standards Test Method RE-3; and

2. Exceed 120 lbs./lf upward load in accordance with ANSI/SPRI ES1-98 Wind Design Standards Test Method RE-3.

1.11 PRELIMINARY / PRE-INSTALLATION ROOFING CONFERENCE

A. Before starting roof deck construction, conduct conference at Project site. Comply with requirements for pre-installation conferences as indicated within Division 1 specifications. Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following:

1. Meet with Owner, Architect, Owner's insurer (if applicable), testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.

2. Review means, methods and procedures related to roofing installation, including manufacturer’s written instructions.

3. Review Project Safety Plan for site conditions, enforcement, compliance, or Owner-imposed restrictions that may be required.

4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

5. Examine site for approved staging areas, disposal sites, and document existing conditions prior to contractor mobilization. Establish scope of work for site restoration and responsibilities.

6. Examine site for condition and completion of areas adjacent to work area. Establish protection required for existing surfaces.

7. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.

8. Review structural loading limitations of roof deck during and after roofing operations.

9. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.

10. Review governing regulations and requirements for insurance and certificates if applicable.

11. Review temporary protection requirements for roofing system during and after installation.

12. Review work limitation by contractor including; start times, end times, days of the week, noise mitigation, fume control and any part of the work that would effect normal building operations.

13. Review trade coordination necessary for job completion.

14. Review roof observation and repair procedures after roofing installation.

B. Convene prior to commencing work of this section at a time and location to be determined by the Owner or Owner's Representative.

1. All parties responsible for work of this section are required to attend including the Architect, Owner, Contractor, and any other trades involved in the roofing work.

C. The agenda for the Pre-Roofing Conference shall include:

1. Review of all systems and materials to be used in the installation of new roofing, installation procedures and coordination required with related work.

2. Review and coordination of all substrate preparation and related work, including installation of curbs or similar items by others.

3. Review and modify roofing applicators proposed sequencing of the work.

4. Inspect and make notes of job conditions prior to installation.

5. Supply to the Owner’s Representative, a letter from the corporate offices of the roofing manufacturer, which states the name, title, address and phone number of the factory-supplied representatives who will be assigned to this project. No exceptions will be made for this item.

1.12 DELIVERY, STORAGE, HANDLING AND DISPOSAL

A. Deliver all materials and store in their unopened original packaging and rolls with labels intact and legible, bearing the manufacturer's name, related standards, and any other specification or reference accepted as standard. Allow no unlabeled materials on site.

B. Deliver materials requiring fire resistance classification to the job with labels attached and packaged as required by labeling service.

C. Deliver materials in sufficient quantity to allow continuity of work.

D. Handle rolled goods as to prevent damage to edge or ends.

E. Select and operate material handling equipment so as not to damage existing construction or roofing.

F. Provide continuous protection of materials against wetting and moisture absorption. Store materials a minimum of 6" off the ground, in a dry, well ventilated place protected from the weather. Enclosed trailers are recommended. Heated or Air-Conditioned storage is required for temperature-sensitive items.

G. Properly tie down insulation to prevent blow off. **No material is to be stored on the roof at any time**. Do not point load roof. Do not store any flammables on the roof.

H. Protect materials against damage by construction traffic.

I. Comply with fire and safety regulations.

J. Protect membrane and flashing materials against coming in contact with coal tar pitch, petroleum, grease, oil, solvents, or other waste products. After exposure to pitch of other waste products, remove contaminated membrane and flashing material from site.

K. Protect materials during delivery to site. Keep materials in safe, dry storage at temperatures recommended by their manufacturers. Materials shall be labeled for ready identification, Label shall include name of manufacturer. **Store materials in a manner so that no direct contact is made with the ground.**

Storage and Handling: Store materials in a dry, well-ventilated place protected from the weather.

1. Do not store materials so as to overload the deck or structural assembly; do not stockpile aggregate surfacing materials on roof. Prepare staging for aggregate stockpile that will prevent contamination of the material.

2. Store all materials on 4” min raised platforms covered with properly secured breathable water resistant covers. Slit shrink wrapping to not permit condensation and cover with breathable tarp.

3. Mark for clear and evident identification all materials that have been subject to moisture. Remove all materials that become wet from the site.

4. Store volatile liquids in a separate storage building or trailer, or remove from the site at the end of each workday.

    a. Store volatile liquids at temperatures recommended by the manufacturer.

5. Do not remove materials from factory packaging until ready for use. Handle roll goods with care; do not use roll goods which have been damaged.

6. Store adhesives and sealants at temperatures between 60°F and 80°F.

L. **Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.**

M. In the event of damage, immediately make all repairs and replacements required by the Owner's Representative.

N. **Disposal:** All removed materials become the property of the Contractor. Inspect all ground areas surrounding roof on a daily basis for loose debris; immediately move all debris off the roof and into approved dumpsters, ready for legal disposal off-site. Dumpster staging areas must be kept neat and tidy; do not allow to overflow. All debris must be transported to a legal dumpsite or recycling facility, and documentation of each load must be maintained by the Contractor.

1.13 QUALITY ASSURANCE

A. Submit written certification from the roofing membrane manufacturer certifying that the proposed roofing assembly, compatibility of materials and total R-Value of the insulation system meet or exceed these specification requirements. Letter shall state that the specifications and drawing details are acceptable to them for the deck and surfacing to which they are to be applied, that there is a compatibility of all materials provided, and the total R-value of the proposed insulation system. Membrane manufacturer shall also submit a letter certifying that the manufacturer has been actively marketing the submitted system for a minimum of five (5) years.

    1. If details for any manufacturer's system proposed in the Contract Documents are not acceptable to the manufacturer, submit corresponding details proposed for the particular application, together with the manufacturer's reasons for not accepting the conditions depicted in the specifications or drawings. No alternate details will be considered without evidence of valid objections on the part of the manufacturer to the contract requirements.

2. No deviation is to be made from this specification without prior written approval by the manufacturer; submit such approval to the Architect.

3. The roofing system manufacturer must provide inspection of guaranteed roofing systems by company employed, salaried personnel dedicated to Technical Services. Sales representatives or sales agents will not be permitted to conduct quality assurance inspections or grant final manufacturers acceptance.

B. EPDM Roofing Applicator Requirements: refer to 1.09-A of this Section.

C. EPDM Roofing Manufacturer Requirements: refer to 1.09-B of this Section.

D. Material Requirements/ Source Limitations:

1. Obtain all membrane sheets, insulation, flashings, prefabricated gravel stops and copings, and all temporary roof materials from a single manufacturer.

E. UL Rating:

1. Provide EPDM membrane and insulation that has been classified by Underwriters Laboratories as a component of Class A roofing system.

F. Wind Uplift:

1. Refer to Article 1.10 of this section.

G. Inspection: Prior to, during installation, and at completion of the installation, an inspection shall be made by a representative of the manufacturer in order to ascertain that the roofing system has been installed according to their published specifications, standards, and details.

1. Warranty will be issued upon approval of the installation (see 1.13 of this section.

H. Test Reports: Provide:

1. **Roof drain and leader test or submit plumber's verification.**

2. **Roof deck adhesive test to be completed by the selected contractor prior to start of their work by a third party company.**

I. **Fire-Test-Response Characteristics:** Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-test Exposure: Class A; ASTM E108, for application and roof slopes indicated.

1.14 JOB CONDITIONS

A. Surfaces on which the roofing membrane system is to be applied shall be clean, smooth, dry, and free of fins, sharp edges, loose and foreign materials, oil and grease.

1. Before beginning work, the authorized representative of the manufacturer shall examine the roof surfaces in order to ensure that all substrates are acceptable, and will ensure the NDL Warranty requirements of this contract.

B. Examine the substrate and the conditions under which roofing work is to be performed, and notify the Architect in writing of unsatisfactory conditions. The Contractor will schedule a coordinated field meeting with the Architect and the authorized manufacturer's representative to review said conditions prior to proceeding with the work. Do not proceed with any work until all unsatisfactory conditions have been corrected.

1. All surface voids greater than 1/4" wide (or limitations as recommended by the roofing manufacturer) shall be properly filled with an acceptable fill material.

C. Moisture Protection:

1. Cover, seal or otherwise protect the roof and flashings so that water cannot accumulate or flow under completed portions. When and where necessary to accomplish this, provide temporary water cut-offs in accordance with the membrane manufacturer's written specifications.

D. Environmental Conditions:

1. Do not smoke or use open flames.

2. Do not apply insulation or roofing materials during rainstorms.

3. Do not apply roofing sheets when wind conditions are such that is difficult to handle the sheets.

4. Proceed with roofing work only when existing and forecasted

weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

5. Do not start roofing if rain is imminent, or ambient temperature is below 40 degrees F.

6. If rain occurs during roof membrane application, cease operations and protect deck, insulation, penetrations and membrane from water damage and intrusion.

7. Provide and maintain fire extinguishers.

8. Comply with all fire regulations. Ensure properly rated, charged, and inspected fire extinguishers are on the roof and staging area.

E. Protection:

1. Take necessary precautions to prevent damage of any kind to adjacent material and work for other trades.

2. Provide protection to prevent damage or staining of building surfaces, paved areas and plantings.

3. Provide enclosed chutes for removing debris from roof level, to roof level and to vehicles below. Do not throw debris from roof level.

4. Protect areas of deck repair at the end of each working day. Protection shall be watertight.

5. Provide and maintain operating water pumps on each roof area to keep areas free of water accumulation. Pump water through hoses of sufficient size to functioning roof drains.

6. Drain Verification:

a. Prior to start of roofing removals, in the presence of the Owner's representative, verify that existing roof drains are operational and are not plugged.

b. Submit in writing that the verification of roof drains has been performed. Include listing and location of non-operational drains.

F. Limit removal of existing roofing to the amount (or areas) that can be replaced with the complete new roofing system (including insulation, membrane, flashing, gravel stops, and related work) in a single working day, maintaining a completely watertight covering on the roof.

1. At the end of each work day, or when weather conditions outside manufacturer's recommended limits are predicted, provide and

install temporary waterstops as recommended by the roofing manufacturer.

a. Permanent roof insulation shall not be installed as base for temporary waterstops.

b. Remove temporary waterstops completely before installing permanent roofing system.

1.15 WARRANTY AND GUARANTEES

A. Contractor's Guarantee: Furnish contractor's guarantee in accordance with Section 01700 for all materials and workmanship starting from date of Substantial Completion. Replace defective roofing at no expense to the Owner.

B. Manufacturer's Guarantee: Furnish manufacturer's twenty (20) year Guarantee similar or equal to *Johns Manville*'s "*Peak Advantage No Dollar Limit Roofing System Guarantee*", and twenty year membrane guarantee. Guarantee shall cover both labor and materials necessary to effect repairs, with No Dollar Limit as to effect roof repairs. Single-source special warranty includes: roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, cover board, walkway products, manufacturer's expansion joints, membrane edge metal products (Edge to Edge) and other single-source components of the roofing system marketed by the manufacturer.

1. Guarantee shall include a wind rider for the repair of damages to roofing system caused by winds up to and including **three second gust of 120 MPH, 33 feet off the ground** as defined by the Beaufort scale.

C. These specifications may require more than what the manufacturer may require for providing a warranty for the roofing system.

D. The NDL Warranty shall be accompanied by a letter from the manufacturer's corporate office, attesting that the entire roofing installation was inspected during the complete course of the project by the factory-authorized representative, who shall be named, and that the entire installation is certified compliant to the manufacturer, and worthy of the required warranty.

1. The NDL warranty shall include, but not be limited to the following conditions:

a. Cracking due to expansion or contraction of the membrane.

b. Deterioration due to exposure to the elements.

c. Decomposition of membrane due to ponding water.

d. Separation of factory and field fabricated seams and joints.

e. Cracking or deterioration of membrane materials from trapped

water vapor under membrane.

f. Separation of or decomposition of membrane flashing.

g. Wind damage sustained up to Factory Mutual Class I-110 classification.

H. Warranty shall also cover leaks caused by accidental punctures: 16 man-hours per year for 60-mil reinforced membranes.

I. Warranty shall also cover leaks caused by hail:

1.Hail up to 1" diameter when 60-mil reinforced EPDM is installed over a High Density closed cell polyisocyanurate foam board, Dens Deck Prime, or Securock.(For Adhered Systems Only).

2. Provide that in the event the roofing system fails to perform, the roofing systems manufacturer will, at its own expense, cause to be made the repairs or modifications to the roofing system necessary to affect water-tightness and will re-inspect the roof and reissue the guarantee after reinspection.

3. In the event repairs are required due to natural disasters, unauthorized alterations, or other causes specifically excluded in the guarantee, the manufacturer will reinspect the roof and reissue the guarantee provided that the methods and materials used in the repair have received prior approval by the manufacturer and the repairs are accomplished by an approved applicator.

4. The manufacturer shall inspect the roof area under this contract every five (5) years of the duration of the warranty period and will provide written observation and associated specific maintenance recommendations, as applicable, to the Owner.

E. **The Contractor is to cover damages to the building resulting from failure to prevent penetration of water during construction.**

F. Pro-rated System Warranties shall not be accepted.

G. Warranty Period: Twenty (20) years from the date of Substantial Completion and must include a 120 mph wind speed rider as required by ASCE-7 of the Building Code of the State of New York.

H. Manufacturer shall have a minimum AAA credit rating; provide written verification of same to Architect as a part of the submittals for this project.

I. **Applicator's Guarantee:**

1. Special Project Warranty: Submit roofing installer's warranty, signed by the Installer, covering the work of this section,

including all components of membrane roofing system such as roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, perimeter metals and walkway products, for the following warranty period: 2 years.

1.16 LABORATORY TESTING

A. Upon request from the Owner or Architect, the roofing membrane manufacturers shall supply, at their expense, the results of mechanical and chemical testing performed on the materials supplied.

B. The tests shall be performed to certify compliance with the standards referenced under this section.

1.17 SITE PROTECTION

A. During roofing work, exposed surfaces of finished walls and ground shall be protected with tarps in order to prevent damage. Contractor shall assume full responsibility for any damage.

B. All work relative to this roof project shall include the use and installation of temporary partitions as necessary and required to adequately satisfy the needs for the separation of construction requirements of Section 01050.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. For the purposes of this specification, and to identify a minimum level of quality, the design is based on the use of either:

1. *Johns Manville Roofing Systems Group*; Denver, CO.

2. *Carlisle Syntec Systems*; Carlisle, PA.

3. *Mule-Hide Roofing Products Co., Inc.*; Beloit, WI

4. Or an approved equal by the Architect.

B. **Such references shall be construed only as establishing the quality of materials and workmanship to be used under this section, and shall not, in any way, be construed as limiting competition by other manufacturers offering products of identical material composition. Products used shall be those upon which the design is based, or shall be equal products, by the Architect.**

C. **Bidders / Applicators seeking approval for substitute materials shall submit their request in writing to the Architect in accordance with the requirements of the Project Manual.**

2.02 ROOFING MEMBRANE

A. Ethylene Propylene Diene Monomer (EPDM) – rubber roofing membrane compounded elastomer meeting the following properties: Specifications are based on Johns Manville's ***JM EPDM R 60 FR*** Reinforced Membrane sheet with Factory Inseam Tape: 4 inch (101.6-mm) wide butyl splice tape with release film.

B. Reference Standard: ASTM D4637, Type II.

C. Typical Physical Properties:

1. ASTM D751 - Thickness (min., sheet-overall): 0.060 inches.

2. ASTM D412 - Tensile Strength (min.): 1305 psi (9.0 MPa).

3. ASTM D5635 - Dynamic Puncture Resistance: Pass.

4. ASTM D5602 - Static Puncture Resistance: Pass.

5. ASTM D751 - Elongation (Ultimate, min.): 300%.

6. ASTM D412 - Tensile (set, max.): 10%.

7. ASTM D624 - Tear Resistance (min.): 110 lbf/in. (26.27 kN/m).

8. ASTM D2137 - Brittleness Point (max.): -45°C (-49°F).

9. ASTM D1149 - Ozone Resistance (no cracks): Pass.

10. ASTM D573 - Heat Aging:
    i. ASTM D412 - Tensile Strength (min.): 1250 psi (8.3 MPa).
    ii. ASTM D412 - Elongation (ultimate, min.): 200%.
    iii. ASTM D624 - Tear Resistance (min.): 125 lbf/in. (21.0 kN/m).
    iv. ASTM D751 - Linear Dimension Change (max.): +/-1%

11. ASTM D471 - Water Absorption (max.): +8/-2 mass %.

12. ASTM G151 - Weather Resistance: G-151,
    i. ASTM G155 - Visual Inspection: Pass.
    ii. PRFSE (min.): 30%.
    iii. Elongation (Ultimate, min.): 200%.

D. Membrane Layer Securement: Adhered. Bonding Adhesive: Manufacturer's standard solvent-based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings. Basis of Design: JM EPDM Membrane Adhesive (Low VOC)

E. Installation Accessories:

1. Detail Membranes and Strips:

i. EPDM Peel & Stick Flashing: A 6-inch or 12-inch wide, uncured

EPDM sheet, with a factory laminated, self-adhering EPDM/butyl tape. Product shall be similar or equal to: *JM EDPM Peel & Stick Flashing*.

ii. EPDM Peel & Stick Sealing Strip: A 6-inch, 9-inch or 12-inch wide EPDM strip, with factory laminated, self-adhering seam tape. Product shall be similar or equal to: *JM EDPM Peel & Stick Sealing Strip*.

iii. EPDM Seam Tape: A 6-inch wide, self-adhering, cured EPDM/butyl rubber splice tape for use between EPDM sheets. Product shall be similar or equal to: *JM EPDM Seam Tape*.

iv. EPDM Reinforced Termination Strip (RTS): A black, 6-inch wide, 45 mil thick, polyester scrim-reinforced, cured EPDM strip. Product shall be similar or equal to: *JM EPDM Reinforced Termination Strip (RTS).*

v. EPDM Reinforced Termination Strip (RTS) With Tape: A black, 6-inch wide, 45 mil thick, polyester scrim-reinforced, cured EPDM strip with a factory-laminated, 3 inch self-adhering seam tape. Product shall be similar or equal to: *JM EPDM Reinforced Termination Strip (RTS) With Tape.*

2. Manufacturer Pre-Molded Flashings:

i. EPDM Peel & Stick Inside/Outside Corners: A 60 mil thick, uncured flashing with a pre-applied peel and stick tape. Product shall be similar or equal to: *JM EPDM Peel & Stick Inside/Outside Corners*.

ii. EPDM Peel & Stick T-Joint Patches: An 8” x 8” wide, uncured EPDM sheet with a factory laminated, self-adhering EPDM/butyl tape. Product shall be similar or equal to: *JM EPDM Peel & Stick T-Joint Patches.*

iii. EPDM Peel & Stick Pipe Boot: A conically stepped pre-molded EPDM membrane with a pressure-sensitive tape on the flange. Product shall be similar or equal to: *JM EPDM Peel & Stick Pipe Boot.*

iv. EPDM Pipe Boot: A conically stepped pre-molded EPDM membrane. Product shall be similar or equal to: *JM EPDM Pipe Boot.*

3. Sealants and Coatings:

i. Sealing / Water Cutoff Mastic: A one-component, low viscosity, self-wetting, butyl blend sealant. Product shall be similar or equal to: *JM Sealing Mastic*.

ii. EPDM Tape Primer: A solvent-based primer for seaming EPDM laps. Product shall be similar or equal to: *JM EPDM Tape Primer.*

4. EPDM Walk Pad:

   i. EPDM Walkpads: A heavy-duty, non-porous, solid rubber walk pad. Product shall be similar or equal to: *JM EPDM Walkpads*.

      Typical Physical Properties:

      1. ASTM D297 - Specific Gravity, Water Displacement Method - Specific Displacement Method: 1.06-1.15 gm/cm.
      2. ASTM D624 - Tear Resistance Die C: Specimens Tested at 20 in./min. (500 mm/min.): 250 lbs./in (43.8 kN/m).

5. Edge Strip:

   i. Tapered Fesco Edge Strip: Shall be manufactured from *Fesco Board*, which is composed of expanded perlite, a volcanic ore, and blended with selected binders and fibers. Product shall be similar or equal to: *Tapered Fesco Edge Strip*.

      Reference Standard: ASTM C728.

      Typical Physical Properties:

      1. ASTM C209 - Water Absorption (% by Volume - 2 hours): 1.5 maximum.
      2. ASTM C165 - Compression Resistance:
         i.5% Consolidation: 30 psi (207 kPa).
         ii.10% Consolidation: 40 psi (276 kPa).
      3. ASTM C209 - Laminar Strength: 7 psi (48 kPa).
      4. ASTM C203 - Flexural Strength: 65 psi (448 kPa).
      5. ASTM C209 - Product Density: 9 psf (144 kgs./m3).
      6. ASTM C209 - Dimensional Stability: 0.5% maximum.

   Drains: Provide similar or equal to *Hercules RetroDrain*.

6. Expansion Joint Covers:

   i. Expand-O-Flash Styles: CF, CFEJ, EJ, EJ/WC

7. Roof Edging System - Fascia: (Where shown on drawings)

   i. Provide a decorative metal fascia with continuous extruded aluminum bar to terminate roofing at perimeter. Provide watertight system with no fasteners. Product to be similar or equal to: *JM Presto-Tite*.

      Typical Performance Characteristics:

      1. Provide meeting or exceeding the requirements of ES-1 and IBC.
      2. Provide extruded bar locks membrane.
      3. Provide injection-molded EPDM anchor bar thermal

expansion splices.

4. Provide a fascia that freely thermally cycles on extruded bar.

Typical Physical Properties:

1. Provide fascia metal gauge: .040” thick formed aluminum.
2. Provide fascia: Standard 12’-0” (3.65 m) lengths.
3. Provide extruded bar: Continuous 6063-T6 alloy aluminum in 12’-0” (3.65 m) standard lengths with pre-punched slotted holes and all bar miters welded.
4. Provide fasteners: #9 x 2” stainless steel with drivers.
5. Provide exterior fascia finishes: Under Base Bid costs, the Architect shall have the option to choose from: natural mill finish, Kynar 500 from manufacturer’s standard colors, custom color Kynar 500, or clear or color anodized. No additional charges shall be made to Owner for Architect’s selection.

Accessories:

1. Provide miters, downspout scuppers, and spill-out scuppers as fabricated by the manufacturer.
2. Employ welded base assembly to maintain watertight integrity.
3. Provide matching brick wall cap, downspout, extenders or other special fabrications as detailed.

8. Roof Edging System - Coping: (Where shown on drawings)

i. Provide a decorative metal coping with continuous extruded aluminum bar to terminate roofing at perimeter. Provide watertight system with no fasteners and butt-type joints with concealed splice plates. Product to be similar or equal to: *JM Metal Presto-Lock*.

Typical Performance Characteristics:

1. Provide design that allows coping sections to expand and contract freely, while locked in place on anchor cleats.

2. Provide design that allows coping sections to be locked to extruded aluminum anchor bar and anchor cleats by mechanical pressure from hardened stainless steel springs factory-attached to the anchor cleats.
3. Provide all splice plates, include factory-applied dual

non-curing sealant strips capable of providing a watertight seal.

4. Performance Requirements:

i. FM 1-90 approved.

ii. Exceeds 75 lbs. per lf outward load in accordance with ANSI/SPRI ES-1-98 Wind Design Standards Test Method RE-

iii. Exceeds 120 lbs. per lf upward load in accordance with ANSI/SPRI ES-1-98 Wind Design Standards Test Method.

Typical Physical Properties:

1. Coping Cover:
   i. Provide snap-on cover, 12 feet (3.65 m) long, with matching 8 inch (203 mm) wide concealed splice plate and two factory-applied non-curing sealant strips.

   ii. Provide .050 inch (1.3 mm) thick aluminum in with Kynar 500 finish.

2. Extruded Anchor Clip:
   i. 12 inch (304 mm) long, 20 gauge (1.0 mm), G-90 galvanized steel anchor clip with two hardened stainless steel springs per clip.

3. Fasteners:

   i. Provide corrosion-resistant #12 x 1-5/8 inch (41 mm) long, with hexagonal head and 5/8 inch (16 mm) bonded washer with EPDM washer seal.

   ii. Provide equivalent corrosion-resistant fastener of type and size required for specific substrate types.

Accessories:

   i. Provide miters, downspout scuppers, and spill-out scuppers fabricated by manufacturer.

   ii. Employ welded base assembly to maintain watertight integrity.

   iii. Provide matching brick wall cap, downspout, extenders or other special fabrications as detailed or required for a complete and proper project.

2.03 WOOD BLOCKING, PLYWOOD AND CANTS

A. Blocking Thickness: Size as indicated or required to bring blocking flush with top surface of insulation and tapered edge strips.

B. Plywood Thickness: As required to bring wood blocking flush with top surface of insulation and tapered edge strips.

C. Install plywood on all masonry surfaces contaminated with asphalt or coal tar.

D. Species: Southern Yellow Pine.

E. Treat on all surfaces, including field cuts.

F. All nailers and blocking material to be free of wane, shake, decay or checks, and pressure treated with water-borne preservatives for above ground use, AWPA LP-2. Standard and kiln dried to a maximum of 19% moisture content. Wood shall be dressed on all sides.

1. Shall be #2 or better lumber, and conform to the current JM and NRCA recommendations on wood nailers as well as conform to the FM Global Loss Prevention Data Sheet 1-49. Creosote and asphaltic preservatives are not acceptable.

G. In order for to provide minimum tapered insulation profiles as necessary, the contractor may need to provide alternate perimeter blocking (and fastening) details, based on verified field conditions. The cost of any field modifications required shall be at no additional cost to the Owner. All blocking attachments shall be certified by a NYS licensed Professional Engineer (who is retained by the Contractor on a consultant basis) certifying that the connections as designed meet or exceed the wind uplift requirements of the roofing system.

2.04 INSULATION

A. Tapered: JM Energy 3 Tapered and Tapered Crickets with a minimum R 30.

1. Polyisocyanurate foam with fiberglass facer on both sides. Manufactured using Pentane as a blowing agent.

2. ASTM C1289-01, Type II, Class I, Grade II (20 psi)

3. Maximum Panel Size: 4 feet x 4 feet. R value: 5.7 per inch.

4. Tapered Insulation: 1/8 inch per foot.

5. Taper crickets 1/4 inch per foot crickets. R value: 5.7 per inch.

6. Compressive Strength: 20 psi minimum at any point. ASTM D1621-73.

7. Flame Spread: 25 or less, ASTM E-81-81.

8. Moisture vapor transmission: ASTM C355, less than 1 perm.

9. Water absorption: ASTM C209, less than 1%.

10. Dimensioned stability: ASTM D2126, 2% maximum 24 hours.

11. Factory Mutual approved and Underwriter's Laboratories listed.

B. Flat Stock: Base Layer – Energy 3- 20 psi (minimum R Value of 30.) Two (2) layers of 2.6 inch in Structurally Sloped areas.

1. ASTM C-1289-01. Type II, Class I, Grade II.

2. Polyisocyanurate foam, fiberglass facer on both sides, manufactured using Pentane as the blowing agent.

3. "R" value: 5.7 per inch

4. Compressive Strength: 20 psi minimum, ASTM D1621-73

5. Flame Spread: 25 or less, ASTM E-81 81.

6. Moisture vapor transmission: ASTM C355, less than 1 perm.

7. Water Absorption: ASTM C209, less than 1%.

8. Dimensioned stability: ASTM D2126, 2% maximum 24 hours.

9. Factory Mutual approved and Underwriter's Laboratories listed.

C. All insulation shall meet or exceed the following requirements when tested in accordance with ASTM E-84:

1. Flame spread less than 25.

2. Smoke developed less than 450.

3. Fuel contributed less than 100.

2.05 ROOF COVER BOARDS (one of the following)

1. Top Layer: Johns Manville's Invinsa Roof Board

a. Cover Board: 1/4 Inch thick.

b. High Density closed cell polyisocyanurate foam board with clay-coated fiber glass facer.

c. Minimum Compressive strength: 150 psi (1034 kPa).

d. Flexural Strength: 2000 psi, ASTM D 1037; 28 lbf ASTM 1037

e. Dimensional Stability: >0.6%, ASTM 2126

f. Moisture Vapor Permeance: <1 perm, ASTM E 96

g. R-Value: 1.0 (hr•ft2•˚F)/Btu, ASTM C 518

h. Water Absorption (max) 2.6%, ASTM C 209

i. Surface Water Absorption: <1 gram, ASTM C473

j. Mold Resistance: Pass, ASTM D 3273

k. Weight per 4 x 8 Sheet: 12 lbs (plus or minus 2 lbs)

2. High Density Gypsum Core Roof Cover Board: Provide gypsum core panel acceptable to the roofing system manufacturer and complying with Factory Mutual requirements for FM approval for Class 1. Gypsum core panel shall be 5/8th inch thick primed fire stop Type X, gypsum core with fiberglass matte facing on both sides. Gypsum core panel shall be fire resistant and meet UL 790 with a Class A Fire Rating. **Product to be equal to DEXcell roof board manufactured by National Gypsum Corp.**

Typical Physical Properties:

1. Thickness: 5/8 inch, nominal.
2. Width: 4 feet (1.22 m).
3. Length: 4 feet (1.22 m), standard.
4. ASTM C473 Method B, Flexural Strength: Parallel 100 lbs. min.
5. ASTM E96 Moisture Vapor Permeance: <23 perm [1314 ng/(Pa•s•m2)]
6. ASTM C518: R-Value 1.0 (hr•ft^2•°F)/Btu (0.18 (m2•°C)/W).
7. ASTM C473, Water Absorption: 10% max.
8. ASTM D1621 Compressive Strength: 900 psi,
9. ASTM C473 Surface Water Absorption: <1 gram.
10. ASTM D3273 Mold Resistance: Pass.

2.06 GYPSUM SUBSTRATE BOARD FOR CEMENTITIOUS WOOD FIBER AND STEEL DECKS

A. Provide Gypsum Core panel acceptable to the roofing system manufacturer and complying with Factory Mutual requirements for FM approval for Class 1.

B. Gypsum core panel shall be 1/2 inch thick primed fire stop, treated gypsum core with a heavy duty coated fiberglass facer, JM DEXcell FA Glass Mat Roof Board by National Gypsum.

C. Gypsum core panel shall be fire resistant with zero flame spread and zero smoke developed when tested per ASTM E-84 tunnel test method.

D. Provide Gypsum core panel on all steel and concrete decks when they are in the same roof section as the Cementitious Wood Fiber decks.

2.07 SBS-SELF ADHERED VAPOR BARRIER FOR WOOD DECKS or DECKS WITH SUBSTRATE BOARD

A. Tri-laminate woven polyethylene, nonslip, UV-protected top surface, with a SBS Rubber and asphalt blend with low air and vapor permeability.

Basis of Design: **JM Vapor Barrier SA**

B. Primer: **JM SA Primer Low VOC**

2.08 SBS-MODIFIED VAPOR BARRIER FOR STRUCTURAL LIGHT WEIGHT, CONCRETE AND GYPSUM DECKS

A. SBS Membrane Vapor Barrier: Thermally fused, Fiber-glass reinforced, SBS Modified asphalt sheet; smooth surfaced; suitable for application method specified; **Johns Manville DynaBase HW**, or approved equal by the Architect. Product shall conform to the requirements of ASTM D 6163, Type I, Grade S.

1. Description: DynaBase HW is composed of selected SBS modified bitumen applied onto a fiber-glass mat with a sanded underside and high brush sanded topside surface. Nominal thickness – 114 mils.

2. Physical Properties:

a. Minimum Thickness: 90 mil (2.29 mm), minimum.

b. Tensile Strength @ 0°F (-18°C):

i. Machine Direction: 105 lbs. force/in. width (18.4 kN/m), minimum.

ii. Cross Machine Direction: 95 lbs. force/in. width (16.6 kN/m), minimum.

c. Elongation @ 0°F (-18°C):

i. Machine Direction: 5%

ii. Cross Machine Direction: 5%

d. Tensile-Tear:

i. Machine Direction: 100 lbs. force/in. width (17.5 kN/m), minimum.

ii. Cross Machine Direction: 90 lbs. force/in. width (15.75 kN/m), minimum.

e. Low Temperature Flexibility: -30°F (-34°C).

f. Dimensional Stability:

i. Machine Direction: 0.1% change.

ii. Cross Machine Direction: 0.1% change.

2.09 INSULATION SECUREMENT AND MEMBRANE SECUREMENT FOR TECTUM DECKS

A. Insulation securement shall be *Johns Manville Polymer Auger Fasteners and Plates* and shall follow the requirements for spacing and fastener length.

B. Membrane layer securement shall be *JM RetroDriller Fastener* designed for attaching Single-Ply membrane systems to structural steel purlins. The *RetroDriller* has a Phillips head and nominal shank diameter of .194 and a thread diameter of .230. Fastener must have corrosion-resistant CR-10 coating, exceeding FM Global Approval Standard #4470 corrosion requirement. The point shall have a ½ inch drill point that can quickly drill into structural purlins a minimum of 1 inch.

1. This shall allow for a quick installation of the round, 20 gauge galvanized steel TPO Coated *JM RhinoPlate*.

2.10 INSULATION SECURE AND MEMBRANE SECUREMENT ON STEEL DECKS

A. Fasteners: Factory-coated steel fasteners and metal or plastic plates on Steel decks meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and furnished by roofing system manufacturer. Basis of Design: High Load Fasteners (#14) and RhinoPlates

1. This allows for a quick installation of the round, 20 gauge galvanized steel TPO Coated JM RhinoPlate.

2.11 POURABLE SEALERS

A. Two-component compatible with materials with which it is used.

2.12 FASTENERS

A. Wood Blocking:

1. No. 14 screws with fluorocarbon coating that penetrate the nailer below 1 ¼ inches. Set in two rows staggered at 12 inches on center. Designed for securing wood to wood.
2. Spiral shanked galvanized nails that penetrate the nailer below 1 ¼ inch. Set in two rows staggered at 12 inches on center.

2.13 DECK REPAIR

A. Furnish and install a fast setting concrete mix, Produce: Quikrete Fast-Set.

2.14 ROOF CURBS

A. Provide a minimum of one row of wood blocking to top of existing curb to raise the flashing a minimum of 12 inch.

2.15 EXPANSION JOINTS (Where indicated on drawings)

A. Provide new expansion joint cover, curb to wall and/or curb formed, 4" wide and 4" vertical.

2.16 ROOF DRAINS

A. **For New Construction roofs**,

1. Single Drain (Primary Only) Model ZC100-DP-EA-VP as manufactured by Zurn, or approved equal by Architect.

2. Double Drain (Primary with Overflow) Model ZC163-DP-EA-VP-W4 as manufactured by Zurn, or approved equal by Architect.

3. Overflow Drain Downspout nozzle Z-199 SS as manufactured by Zurn, or approved equal by Architect.

B. **For Existing Roofs,** The Contractor shall remove the existing Roof Drain Dome Strainers and Flashing Clamp Rings and discard, clean and prep remaining drain bowl assembly for new roofing. Contractor to Install New Cast Iron Dome Strainers, Flashing Clamp rings and 2" Cast Iron Static Extension Ring, replace all missing or damaged components with new to match as manufactured by Zurn, or approved equal by Architect.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that Work of other trades which penetrates the roof deck or requires personnel and equipment to traverse the roof deck has been completed.

B. Examine surfaces for inadequate anchorage, foreign material, moisture, and unevenness that would prevent the execution, and quality of application, or the roofing system as specified. Do not proceed with application of the roofing system until all defects are corrected.

3.02 PREPARATION

A. Structural Concrete Decks; Surface Preparation:

1. Inspect concrete decks closely for smoothness, cracks over 1/8 inch, spalling, rust staining, excessive deflection, and moisture. Perform the manufacturer's dryness test to ensure that the deck is ready to receive the roofing system and that application medium bonds well to the surface.

2. Unacceptable areas should be brought to the attention of the General Contractor and Project Architect and must be corrected prior to installation of roofing system.

3. Ensure that all wood blocking has been installed as detailed in the plans and specifications, or as required for a complete and proper project.

4. Ensure that all counterflashing, receivers, curbs, etc. are constructed in such a manner as to provide a minimum 8" base flashing height measured from the finished roof's surface to the top of the base flashing membrane.

3.03 REMOVAL

A. Remove the existing roofing and insulation down to the existing deck along with all fasteners and plates, removing only that portion that can be made watertight at the completion of the workday or before any inclement weather.

B. Verify deck is clean and smooth, free of depressions, waves, or projections. Verify flutes of steel deck are clean and dry.

C. Do not apply roofing materials to damp, frozen, dirty, dusty, or

deck surfaces unacceptable to the manufacturer.

D. Surfaces that will receive roofing shall be in a condition ready to receive the required roofing per the manufacturer's requirements.

3.04 PHASE APPLICATION

A. Phase application of the roofing membrane will not be permitted. Apply all materials to the area during the same day that it is started, including making all areas watertight. All seams are to be sealed each day.

3.05 CONDITION OF SURFACE

A. Surfaces that will receive roofing shall be in a condition ready to receive the required roofing per the manufacturer's requirements.

B. Wood Deck: Verify securement, flatness, joint spacing, and slope of wood decking.

1. Replace damaged or defective areas prior to commencement of work under this section.

2. Seal joints of plywood with tape.

3. Fill knots with latex filler.

C. Clean the substrate of projections and substances detrimental to the work.

D. Install cant strips and similar accessories as shown and as recommended by the roofing systems manufacturer even though not shown.

1. Install wood nailers at the perimeter of the entire roof and around penetrations as indicated.

a. Anchor nailers to roof deck in accordance with Article 3.05, G, H and I.

E. Prime the substrate if recommended by roofing system manufacturer; comply with manufacturer's recommendations.

1. Prime the entire surface with the manufacturers's Concrete Primer.

F. Coordinate roofing with flashings and other adjoining work to insure proper sequencing of the entire work.

G. Metal Deck: Verify securement and slope of metal decking.

1. Replace damaged or defective areas prior to commencement of work under this section.

2. Verify flutes of steel deck are clean and dry.

H. Concrete Decks:

1. Verify slope and condition of concrete decking.

2. Ensure flatness and verify tight joints of concrete deck.

3. Verify adjacent precast concrete roof members. Do not vary more than 1/4 inch in height. Verify grout keys are filled solid.

3.06 PREPARATION

A. No trace of surface water shall be present. Materials under roofing shall be completely dry. Sweep surface clean of dust, debris, and loose and foreign materials.

B. Start of application of roofing signifies acceptance of existing conditions.

3.07 WOOD BLOCKING, CANTS AND PLYWOOD

A. Wood blocking is required, as indicated in the details and drawings, and as required by existing field conditions, whether specifically detailed or not.

B. Provide new treated wood blocking where existing wood blocking that is not indicated to be removed is deteriorated.

C. Provide treated wood blocking at perimeter of roofing membrane, all sides of penetrations by roof accessories, mechanical curbs, and other areas where blocking is required by membrane manufacturer to nail membrane and flashing in place.

D. Blocking Thickness: Equal to thickness of insulation. (1/2 Inch).

E. Provide wood blocking to raise existing equipment curbs flashing heights; maintain 8 inches minimum height above membrane, or as required to obtain membrane roofing system manufacturer’s 20-Year No Dollar Limit Warranty.

F. Provide wood blocking, and plywood at locations indicated.

G. In all areas where nailers are required, they shall be firmly anchored to the deck to resist a minimum force of 200 lbs./lineal foot (2.9 kN/m) in any direction. A ½” (15 mm) of each end. Spacing and fastener embedment shall conform to FM Global Loss Prevention Data Sheet 1-49.

H. Secure wood blocking to wood blocking with 16d nails at 6 inches on center. Stagger nails on each side of blocking.

I. All woodwork to be reused shall resist a minimum force of 200 lbs. /lineal foot (2.9 kN/m) in any direction and shall be free of rot. If any existing woodwork is questionable, it shall be removed and replaced with suitable new materials.

3.08 INSTALLATION OF THE VAPOR BARRIER ON CONCRETE.

A. Prime the concrete deck with JM Concrete Primer at the rate of 1 gallon per 100 sq. ft. Allow primer to dry thoroughly.

B. Thermally fuse as per the manufacturer's recommendation and details the SBS Vapor Barrier to the primed concrete deck lapping end laps 6 inches and side laps 3 inches.

3.09 INSTALLATION OF THE VAPOR BARRIER ON GYPSUM DECKS.

A. Install the Base Ply sheet to the existing gypsum plank deck as per FM Global Data sheet 1-29.

1. Field fastening: 9 inches on center at laps and 2 equally spaced rows between laps at 9 inches on center staggered.
2. Perimeter fastening: 5 inches on center at laps and 2 equally spaced rows between laps at 7 inches on center staggered
3. Corner fastening: 5.5 inches on center at laps and 3 equally spaced rows between laps at 5.5 inches on center staggered.

B. Over the fastened base sheet on the gypsum decks thermally fuse as per the manufacturer's recommendation and details the SBS DynaWeld Base Vapor Barrier to the mechanically fastened base sheet lapping end laps 6 inches and side laps 3 inches.

3.10 INSULATION AND COVER BOARD INSTALLATION

A. General:

1. All layers of insulation and cover board shall be installed in accordance with the manufacturer's current published specifications and recommendations for use with adhered roofing systems. All joints shall be tight and in parallel courses with end joints staggered. When more than one layer of insulation is to be used, succeeding layers are to be laid staggered in relation to the previous layer of insulation and all joints shall be likewise staggered.

2. Insulation and cover board shall be neatly cut to fit around all penetrations and projections with a maximum allowable gap of ¼" (8mm).

3. Open joints shall be repaired with like insulation material.

4. When the insulation is installed on steel decks after a complete tear-off or in new construction, no edges are to be left unsupported

along the flanges.

5. Insulation shall be feathered or tapered to provide a sump area a minimum of 36”x36” (0.92m x 0.92m) where possible at all drains.

6. Install no more insulation and cover board in one day than can be covered with the EPDM Adhered Membrane or when the onset of inclement weather is anticipated.

B. All Layers of Insulation on Concrete and Gypsum Decks:

1. Starting at the low edge of the roof, install thermal layer and protective layer in specified urethane adhesive.

2. Install boards with long joints continuous.

3. Install with long joints running parallel to the decking.

4. Stagger short joints.

5. Butt joints tightly.

   a. “Occasional” joint widths up to ¼” will be allowed. Fill all/any widths greater than ¼” with scrap thermal layer to achieve consistent surface.

6. Use tapered insulation panels in areas requiring slop to achieve a minimum slope of 1/8 inch per foot, and ¼ inch per foot for crickets and where required to redirect drainage.

7. Set thermal layer in a serpentine fashion using 2 part urethane insulation adhesive applied in 3/4 inch wide beads at the following rate:

   a. Field – Beads at 4 inches on center.
   b. Perimeter – Beads at 4 inches on center.
   c. Corner – Beads at 4 inches on center.

8. Place board into the adhesive while it is still tacky; if adhesive reaches its tack-free state, remove and re-apply adhesive.

9. Press the thermal layer into the adhesive to a firm and uniform bearing.

10. Use ballast on all four corners of the board for a minimum of 30 minutes to ensure proper contact of the material and adhesive, if necessary.

11. Keep insulation absolutely dry at all times; discard insulation that contains moisture.

12. Install only as much insulation as can be covered with roofing membrane the same day.

13. Repair any defects or installation errors prior to next phase of roof system installation.

C. Installing Cover Board Layer on Concrete and Gypsum Decks:

1. Two-Part Urethane Insulation Adhesive: Starting at the low edge of the roof, install thermal protective layer in specified urethane adhesive.

a. Install boards with long joints continuous; Install with long joints running parallel to the decking.

b. Stagger short joints.

c. Butt joints tightly.

i. "Occasional" joint widths up to 1/8" will be allowed. Fill all any widths greater than 1/8" with scrap thermal protective layer to achieve consistent surface.

f. Set thermal protective layer in a serpentine fashion using two-part urethane insulation adhesive applied in 3/4 inch wide beads at the following rate:

1. Field: Beads at 4 inches on center.
2. Perimeter: Beads at 4 inches on center.
3. Corner: Beads at 4 inches on center.

f. Place the board into the adhesive while it is still tacky; if the adhesive reaches its tack-free state, remove and re-apply adhesive.

g. Press the thermal protective layer into the adhesive to a firm and uniform bearing.

1. Use ballast on all four corners of the board for a minimum of 30 minutes to ensure contact of the material and adhesive, if necessary.

h. Keep insulation absolutely dry at all times; discard insulation that contains moisture. Install only as much insulation as can be covered with roofing membrane the same day.

i. Repair any defects or installation errors prior to the next phase of roof system installation.

3.11 INSTALLATION OF SINGLE PLY EPDM SHEET MEMBRANE

A. At the end of each day's work, protect the installed roofing and insulation by closing off edges of the system with water cut-off.

1. Remove water cut-off sealants completely and clean prior to resuming roofing application.

B. Position roofing membrane without stretching. Allow membrane to relax for approximately 30 minutes to one hour before fastening, splicing or securing membrane.

C. Adhered EPDM; starting at low edge, install EPDM membrane to properly prepared substrate following manufacturer’s instructions for complete installation of a fully adhered membrane.

1. Begin by applying the sheets shingle fashion with all side laps perpendicular to the slope. Offset end laps a minimum of three (3) feet. Ensure the membranes overlap sufficiently to permit a six (6) inch lap. Position sheets so that lap seams are not “bucking” water. Fold sheet back one-half its width. Fold so that there are no wrinkles or buckles.

2. With a roller, evenly apply a coat of bonding adhesive to the exposed underside of the membrane and cover board. Apply adhesive evenly without puddles or globs. Do not apply bonding adhesive to splice areas. Allow the cement to dry until it is tacky, but does not string or stick when touched with a dry finger. Roll the coated membrane onto the coated substrate, avoiding wrinkling, stretching or buckling. (Remove all sheets that have wrinkles) Brush down bonded half of sheet with a good, stiff push broom or similar device to ensure a good contact, and adhesive bond. Fold back the other half of membrane, and repeat procedure for bonding. Install adjacent sheets with 4 inch lap edges.

3. At end lap areas, apply tape primer wash and allow to dry to the touch. Install seam tape over prepared bottom membrane. Roll the top EPDM sheet onto the seam tape, with the release paper still in place. Remove the seam tape by peeling it back parallel to the roof surface and away from the splice at a 45 degree angle.

4. Tape to Tape Installation: Align membrane for appropriate overlap, remove release liners and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation.

5. Hand-roll the seam: First, roll perpendicular across the entire splice and toward the outside edge. Then, roll along the length of the splice.

Note: Extend membrane over roof edges, covering the full height of wood blocking. Secure in place on face of blocking.

Install cant dam over top of membrane. Set cant dam in full bead of sealant mastic.

3.12 MEMBRANE SPLICING IN-SEAM TAPE

A. Fold un-bonded membrane back. Fold so that there are no wrinkles.

B. Clean both mating surfaces using clean fiber rags or natural sponges. Clean with primer/ wash cleaning agents approved by the roof manufacturer.

C. Roll 6 inch seam tape in a straight line at lap area. Peel off paper as roll progresses along seam line. In-seam tape not to exceed ¼ inch exposure along edge.

D. Roll the top membrane onto the adhesive, avoiding wrinkles and buckles.

E. Roll splice with 2 inch steel roller, using pressure toward the outer edge of the splice.

F. Clean the splice edge with cleaning agent approved by manufacturer.

G. Provide polyester reinforced termination strips at base of vertical surfaces, such as curbs, walls, roof hatches, skylights and roof top equipment.

3.13 LAP-SEAM COVER TAPE WHERE REQUIRED

A. Clean surfaces of membrane at areas of field seams with cleaning agent approved by manufacturer.

B. Install 6 inch wide self-adhering tape with roller using pressure toward the outer edge.

3.14 FLASHING

A. Preparation: Inspect all walls, curb heights, counterflashings, etc. and check for conformance with minimum base flashing height of eight (8) inches. Correct any non-conforming areas prior to installation of flashing.

B. Follow same procedures as described for cleaning, adhesive application, and lap sealant application.

C. EPDM Flashing Materials:

1. Install cured EPDM membranes for flashing of all straight walls, large curbs, and all large straight-sided penetrations.

2. Install uncured EPDM flashing or uncured EPDM Peel & Stick Flashing for flashing of all pourable sealer penetration pockets, vent pipes, scuppers, curbs, T-joints and inside/outside corners of wall flashings.

D. Primer: Prime all metal with tape primer/wash. Allow the primer to dry thoroughly.

E. Installation: Install reinforced termination strip per manufacturer's published details to secure field sheet at all walls and curbed penetrations. Adhere all EPDM Flashing membranes to any horizontal or vertical substrates with EPDM Bonding Cement.

1. Apply EPDM Bonding Cement evenly with a roller to flashing membrane and substrate. Allow to dry to tacky, so adhesive does not string when touched.

2. Roll the membrane into the substrate to avoid wrinkling or stretching. Take care to ensure that the flashing does not bridge at any change of plane such as the transition from the roof deck to a parapet wall.

3. Secure terminations utilizing aluminum compression bars or surface-mounted counterflashings directly to a smooth-sealed wall surface.

4. Fully extend flashings terminated with metal copings under the coping and mechanically fasten at a minimum of 1-1/2" down the face of the wall.
5. Flash all pipes with peel and stick flashing boots or an approved field flashing (as detailed in the manufacturer's specifications).

6. Install field sheet up and over wood blocking at all fascia or coping areas fastening the sheet on the outside face of the wood blocking.

7. At vertical surfaces apply EPDM flashing over polyester-reinforced termination strip. Extend flashing 4 inch minimum onto the roof surface and full height of curbs and vertically up walls a minimum of 12 inches unless indicated otherwise. Remove roof top equipment to extend flashing over the top of the curbs. Provide deck overlayment on vertical surfaces.

8. Remove roof top power ventilators, extend top of curb to minimum 12 inches above roof line. Extend flashing over top of curb. Reset equipment.

9. Provide termination strip and continuous bead of sealant under counter flashing.

10. Straight run wall and curb flashings shall be flashed with EPDM membrane. **Note: All flashings are to extend a minimum height of 8" (200mm) above the roof level.**

11. On all re-roofing applications, loose flashing materials must be removed down to a sound substrate and replaced with new flashing. To ensure proper drainage of the existing structure, weep holes must never be covered by new flashings.

12. Terminations utilizing aluminum compression bars are surface-mounted counter-flashings must be secured directly to a smooth and sealed wall surface.

13. EPDM wall flashings terminated with metal copings must be fully extended under the coping and mechanically fastened to a minimum 1 ½" (40mm) down the face of the wall.

14. EPDM Flashing Membrane shall be adhered to substrate using EPDM bonding cement. Follow the EPDM adhered instructions for correct application of this cement. The flashing membrane shall be rolled carefully into the substrate. Care must be taken to ensure that the flashing does not bridge at any change of direction, such as from the base of a parapet wall to the roof deck.

3.15 INSTALLING ROOF EDGING SYSTEM

A. Inspection: Verify that the roof edging installation will not disrupt other trades. Verify that the substrate is dry, clean and free of foreign matter. Report and correct any defects prior to any installations.

B. Installation of Roof Edging System: Submit product design drawings for review and approval to the Architect before fabrication.

C. The Contractor is fully responsible to check all as-built conditions and verify the manufacturer's roof edge details for accuracy to fit the wall assembly prior to fabrication. **Contractor's Note: Submitted roof edge details will accurately depict existing conditions and will be supplied to resolve existing conditions at no additional cost to the Owner.**

D. Comply with the roof edging manufacturer's installation guide when setting the roof edging.

E. Use provided fasteners consistent with the manufacturer's instructions, suitable for the substrate to which it is being installed.

F. Install water cut-off, as recommended by the membrane manufacturer, under the anchor bar.

G. Roof Edge Flashing Strips: Install all flashing strips in longest lengths possible to minimize laps under the anchor bar. Following the manufacturer's application method for flashing, install the strips:

   1. Minimum 8 inches into the field of the roof;
   2. Down the outside face of the wall, ½ inch past wood nailers.

H. Miter & Scupper Bar: Remove all dirt, dust and debris from the anchor bar. Apply a 3 inch wide and ¼ inch thick band of mastic to the back of the anchor bar.

I. Splice Plates: Apply a 3/8 inch bead of non-curing sealant to both

sides of the spacer and on the deck flange.

J. Anchor Bar: Position 12-foot long sections of anchor bar with applied mastic overlapping splice plate and butting securely to the EPDM gasket.

1. Allow ½ inch space between anchor bars.
2. Install splice plate at opposite end of 12-foot long anchor bar.

Fasten anchor bar at 12 inches on center intervals through. Use 2" stainless steel fasteners as provided by the manufacturer. Field cut sections as necessary.

K. Fascia Panels: Install panels left to right. Position 12' fascia panels on top of the anchor bar. Overlap preceding panel by 1 inch at notches provided. With panels in correct position, snap each section into anchor panel.

3.16 WALKWAY PADS

A. Provide manufacturer's standard EPDM walkway pad under each ladder, roof hatch and completely around each HVAC unit and to any other areas designated on the drawings. Install in accordance with manufacturer's requirements with lap cement or seam tape.

3.17 EXPANSION JOINT

A. Install a new expansion joint cover, curb to wall, curbed formed as per the manufacturers' specifications.

3.18 WATERSTOPS

A. Install temporary cutoffs around incomplete edges of roofing assembly at the end of each workday and when work must be postponed due to inclement weather. Straighten the insulation line using loosely laid pieces of insulation. Seal the JM EPDM membrane to the deck or existing membrane by performing the following procedure: Fold the edge of the roofing membrane back a minimum of 12" (300mm). Clean the surface of the folded-back membrane with JM EPDM Tape Primer/Wash or other approved cleaning method. Apply a ¼" (8mm) bead of JM Lap Caulk or Pourable Sealer on the cleaned area of the sheet. If the roofing membrane installation is to be delayed for 14 days or more, of if the substrate surface is rough, apply two ¼" (8mm) beads of sealant. Remove the temporary seams completely when work resumes, cutting out the contaminated membrane. Remove all sealant, contaminated membrane, insulation fillers, etc. from the work area and properly dispose off-site.

3.19 ROOF DRAINS

A. New Roofs:

1. Set drain flange tight to roof deck.

2. Secure roof drain to roof deck with approved under deck clamp bolted to underside of drain body

3. Insulate roof drain sump and horizontal piping.

4. Coordinate with types, locations, and quantities as indicated on plans.

B. Existing Roofs:

1. The Contractor shall remove the existing Roof Drain Dome Strainers and Flashing Clamp Rings and discard.

2. Clean and prep remaining drain bowl assembly for new roofing.

3. Contractor to Install New Cast Iron Dome Strainers, Flashing Clamp rings and 2” Cast Iron Static Extension Ring, replace all missing or damaged components with new to match as manufactured by Zurn, or approved equal by Architect

C. Provide a smooth transition from drain bowl to deck surface.

1. Taper insulation back from drain a minimum of 24” to provide for positive drainage.

2. Prime all metal surfaces.

D. Install EPDM membrane at drain bowl.

1. Proceed with installations only after unsatisfactory conditions have been corrected.

2. Extend membrane 1" beyond the inside edge of the drain bowl.

3. Position membrane so as to avoid the occurrence of any seams at drains.

E. Install clamping ring and drain covers supplied with drain.

F. Test all drains for proper flow and watertightness. Correct defects.

3.20 VENT STACKS AND PENETRATIONS

A. Use pre-molded pipe boot for vent stacks.

B. Use peel and stick pipe boots for all hot pipe penetrations.

C. Use roof penetration pocket flashing with nailer and pourable sealer for all angles and unusual penetrations.

3.21 INSPECTIONS

A. After all roofing system work is completed, provide an inspection by the roofing system manufacturer's representative. Representative must be employed expressly as a technical employee and not concurrently in a sales role. Provide, via the representative, documentation verifying that roofing system has been installed according to the Specifications.

B. All work shall also be subject to inspection by Architect and Owner. Work found to be in violation of specifications or not in accordance with established workmanship practices and standards will be subject to complete removal and proper replacement with new materials at contractor's expense.

3.22 CLEANING

A. Clean up and remove daily from the site all wrappings, empty containers, paper, loose particles, and other debris resulting from these operations.

B. Remove markings from finished surfaces. Restore all other building surfaces and areas affected by the roofing application to the same conditions of aforementioned on day of job start.

C. Repair or replace defaced or disfigured finishes caused by work of this section.

D. Keep newly installed roofing membrane clean and new in appearance under the assumption that all areas of roofing are aesthetically essential. Contractor may be directed to remedy – and if no remedy available – replace, newly roofed areas that are not maintained as such during the balance of installation.

3.23 PROTECTION

A. Provide traffic ways, erect barriers, temporary interior partitions and enclosures, fences, guards, rails, enclosures, chutes, and the like to protect personnel, roofs, and structures, vehicles and utilities.

B. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8" thick.

C. In addition to the plywood listed above, an underlayment of minimum 1/2-inch recovery board is required on new roofing.

1. Special permission must be obtained from the manufacturer before any traffic will be permitted over new roofing.

3.24 FIELD CONTROL

A. Field inspection will be performed as outlined under 1.11 of this

section.

3.25 TESTING OF COMPLETED ROOF SYSTEM

A. Schedule flooding of roofs with the Owner. No flood testing will be allowed when buildings are occupied. Flood each area of roofing membrane with no less than a 2" depth of water. Include all areas sloped not over ¼" per foot. Provide temporary dams where required. Leave in place 24 hours and examine substructure for evidence of leakage. Repair leaks and retest as before, until no leakage is observed.

3.26 POSITIVE DRAINAGE

A. The General Construction Contractor or the roofing contractor (if separate prime contract) shall be responsible for installing the roof slope and drainage in accordance with N.R.C.A. standards. Additionally, the Contractor shall be responsible for the installation of structural steel, roof decking, roof drains, tapered insulation, perlite, crickets, roof plies, etc. in accordance with and to the tolerances indicated in the contract documents. **There should be no standing water on any portion of the entire roof surface 48 hours after a rainfall, during ambient drying conditions.**

B. The roof manufacturer's representative shall witness the conducting of the positive drainage exercise, and sign-off on same.

END OF SECTION

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07602 - FLASHING

PART 1 - GENERAL

1.01 SUMMARY

A. Provide and install new cap and base flashing as required for proper installation, as shown on drawings and specified herein.

1.02 DELIVERY AND STORAGE

A. Delivered materials shall be in the manufacturer's original packages and containers, clearly marked with the approved manufacturer's name and trademark for every item.

B. Store all materials in a dry, ventilated place off the ground. During adverse weather conditions and job delays, store materials under cover or in a totally enclosed space. Use of wet materials will not be permitted.

1.03 PREPARATION

A. Wood blocking and nailers for flashing cleats shall have been rigidly anchored in place.

B. Dissimilar materials in contact shall be fully isolated from each other. Unprimed, abraded, or otherwise corrosive surfaces of metal shall receive a coat of the bituminous paint, and allow to dry before assembling.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Aluminum: ASTM B209, .032" thick aluminum alloy 3003-H14.

B. Copper: ASTM B152, 16 oz. and 20 oz. soft temper. Copper exposed to weather shall be lead coated as per ASTM B101. Class "A".

C. Solder: As recommended by the copper manufacturer. Conform to ASTM B32 - min. tin content for lead coated copper 60 percent.

D. Stainless Steel: Sheets or strips - ASTM A167, Type 302 or 304 gauge. .015 inch - 8 to 10 foot lengths. Finish - 2D. Solder - ASTM B32 - 60-40% block tin and piglead. Flux - Acid type. Sealant - single component synthetic rubber - color as selected by Architect.

E. Nails: For copper work, 3/8" diameter head, solid copper.

F. Pop Rivets: Noncorrosive metal, may be used where watertightness of

fastener is not a factor or if waterproof rivets are used.

G. Standard of Workmanship: Methods of forming and joining copper shall be as specified and detailed in the booklet "Copper and Common Sense", published by Revere Copper and Brass Incorporated, except as modified herein and suggested guide specifications for "Stainless Steel Roofing and Flashing" published by International Nickel Company, Inc.

H. Pipe Flashing: Flashing around pipes and vents extending above the roof shall consist of copper stainless zinc tubes of proper diameter, extending at least 12" above the finished roof surface, and extending at least 6" beyond opening.

I. Mechanical Equipment Flashing: Examine plans and specifications for mechanical and electrical trades and note extent of flashing covered herein. Provide all flashing in addition thereto as necessary.

PART 3 - EXECUTION

3.01 EXAMINATION

A. The installer shall examine the substrate and the conditions under which flashing work is to be performed, and notify the Contractor in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in an acceptable manner.

3.02 PREPARATION

A. Coordination:

1. Coordinate flashing work with other work for correct sequencing of items making up entire system of waterproofing and rain drainage.

2. Do not proceed with the installation of flashing work until curb and substrate construction, cant strips, blocking, reglets, and other construction to receive the work are complete.

3.03 INSTALLATION

A. Comply with manufacturer's instructions for handling and installation of flashing work.

1. Unless otherwise recommended by manufacturer, comply with recommendation of SMACNA "Architectural Sheet Metal Manual" for items shown on drawings.

2. Comply with details and profiles shown on drawings.

B. For non-moving seams, provide soldered flat lock seams, except as otherwise indicated. Comply with metal producer's recommendations

for tinning, soldering, and cleaning the joints.

1. Flashing and trim: 10'-0" maximum spacing, and 2'-0" from corners and intersections.

2. Conceal fasteners and expansion provisions wherever possible. Fold back edges on concealed side of exposed edges to form a hem.

3. Insert flashings into reglets where shown. Anchor by mechanical means, including driven wedges of lead or other compatible metal, space 2'-0". Seal the joint with sealant as indicated.

4. Separate copper work from dissimilar metals by a 15 mil dry film thickness bituminous coating or by a heavy tinning of solder at spot contacts.

5. Fabricate, support, and anchor rain drainage in a manner which will withstand thermal expansion stresses and full loading by water or ice, without damage, deterioration, or leakage.

6. On bituminous membranes, provide not less than 4" embedment of flashing in membrane, and cover edge with tape or stripping set in roofing cement.

3.04 MISCELLANEOUS WORK AND CLEANING

A. Do all necessary cutting, patching fitting in connection with the flashing work required to coordinate this work with that of other trades.

B. On completion, flashing work shall be left in perfect condition. Neutralize excess flux which may cause acid stains in washing soda.

END OF SECTION

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

SECTION 07800 – ROOF ACCESSORIES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 – Specification Sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Work included: Furnish labor, materials, tools, and equipment necessary or required to perform and complete the installation of gutters and downspouts as indicated on the drawings and specified herein.

1.03 QUALITY ASSURANCE

A. Installing Contractor shall be responsible for installing gutter system in accordance with manufacturer's printed instructions. Follow primary roofing material manufacturer's printed instruction for installation of eave trims.

1.04 SUBMITTALS

A. Prior to start of installation, the installing Contractor shall furnish details or catalog cuts indicating products to be used to conform to these specifications.

1.05 DELIVERY AND PRECAUTIONS

A. All products delivered shall be stored in a clean, dry location prior to installation.

B. Products furnished with strippable protective plastic film should have film removed prior to installation. Such film-coated products shall not be exposed to sunlight for more than 30 minutes without removing film.

C. Workmen shall use diligent care to avoid damage, scars, and abrasions to product when handling.

PART 2 – PRODUCTS

2.01 GENERAL

A. Design is based on use of gutters as manufactured by Perimeter Systems, division of Southern Aluminum Finishing Company, and the terminology used may include reference to that manufacturer's proprietary products. Such reference shall be construed only as establishing the quality of materials and workmanship to be used under this section and shall not, in any way, be construed as limiting competition.

B. Products used shall be those upon which design is based or shall be equal products approved in advance by the architect.

2.02 MATERIALS

A. Gutters:

1. Gutter system with accessories, manufactured of aluminum, .040" thickness.

2. Gutters shall be manufactured in 10'-0" lengths, of .040" mil finish aluminum tapered and notched to provide a 1" telescoping lap joint. Gutters shall be prepunched at 12" o.c. to provide for thermal movement after installation and be provided with alternating bracket slots to interconnect associated brackets.

3. Snap-over fascia shall be Colonial Series press formed in 10' lengths with true and repeated shapes. Fascia joints shall receive 6" concealed splice plates with finish to match fascia.

4. Provide manufacturer's standard support brackets and interior straps for installation at 30" o.c. Brackets shall be 1/8" x 1", of compatible material to gutter, with matching finish and color.

B. Downspouts:

1. Downspouts to be .050" gauge bronze anodized aluminum.

2. Downspouts shall be manufactured 10'-0" lengths, factory offset on one end to provide a ¾" telescope joint. Downspout shall contain a factory mounted back, which is non-sealed to allow seepage of water in overflow conditions.

3. Elbows for downspouts shall be welded construction, with matching finish applied after welding. Such finish shall be of quality equal to finish for non-welded parts. Grinding and spray painting of parts to match will not be permitted. Elbows will be provided with a factory offset on its lower end to allow a ¾" telescope joint.

4. Provide manufacturer's wall brackets of compatible material to downspout to facilitate both interior and exposed downspouts, with matching finish and color.

PART 3 – INSTALLATION

3.01 SUBSTRATE PENETRATION

A. Wood Plates: All horizontal plates to receive gutters shall be installed true and straight and free of splinters, knots, or other irregularities. Minimum plate thickness shall be ¾-inch plywood. Follow local building codes or Factory Mutual Loss

Prevention Data 1-49 (whichever is greater) for proper attachment of plates.

B. Fascia boards shall be installed in a vertical fashion, true and straight and free of knots, splinters, or other irregularities. Soffits, extenders, or cladding to be applied to fascias shall be installed prior to gutter installation.

C. Wall Conditions: Wall surfaces that shall

3.02 INSTALLATION PROCEDURES

A. Review carefully and follow primary roof materials manufacturer's general recommendations as to installing waterproof membranes to this gutter system.

B. Support Bracket Installation: Locate low and high points of gutter installation and chalk a guide line to allow a maximum ¼"/40' slope. Install support brackets at 30" on center aligned with the chalk or other type of guideline. Take care to avoid locating bracket directly over downspout outlet locations. Attach brackets with 16d coated nail or 2" x #10 wood screw.

C. Gutter Installation: Install gutter sections from left to right (roof side) into support brackets. Insert each telescoping section into previous section for a distance of 1", seal and rivet at 2' o.c. Provide sealants and fasteners as provided by manufacturer. Nail rear upper portion of gutter with 1 ½" nails through prepunched elongated holes at 12" o.c.

D. Inside Strap/Snap-Over Fascia Installation: Position snap-over fascia on gutter assembly by hooking the fascia's lower hemmed edge onto the support bracket's retainer. Insert inside straps at 30" o.c. alternating with support brackets with hook portion of strip positioned to lock snap-over fascia into place. Strap shall be hooked into slotted holes at leading edge (bead) of gutter and riveted at its rear side. In no case shall strap be nailed, screwed, or otherwise fastened which would restrain thermal movement of product.

E. Expansion Joints: At 40'-0" intervals, or as shown on the plans, install manufacturer's standard elastomeric expansion joint assembly. At snap-over fascia joints, insert concealed splice plate and allow a 3/8" gap between adjoining sections.

F. Miter Corners: Install manufacturer's welded miter units at locations shown on plans. Gutter corners shall have 30" legs, prepunched, notched, and telescoping to match gutter. Fascia corners shall have 30" legs and shall be finished after fabrication, grinding and touch-up painting will not allowed.

G. End Caps/Terminations: Install manufacturer's end caps at all end terminations. End caps shall be riveted at 2" o.c. and sealed.

H. Outlets: Locate all outlet locations and field cut hole in a neat workmanlike manner. Hole shall be located at a distance of 1" from backside of gutter. Insert manufacturer's outlet, fasten in

place with 4 rivets (one being located on each flange), and seal. Field cut snap-over fascia in a neat workmanlike manner to accommodate downspouts.

END OF SECTION

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07900 - CAULKING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. The General Conditions accompanying these specifications shall apply to and bind all Contractors for the work.

1.02 SCOPE

A. The work covered by this section of the specifications consists of furnishing all plant, labor, equipment, appliances, and materials and performing all operations in connection with the application of caulking complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

1. It is the intent of the caulking work under this Section to provide waterproof seals at all joints where shown on drawings.

1.03 APPLICABLE SPECIFICATIONS

A. The following Federal Specification forms a part of this specification:

1. TT-C-598 Compound, Caulking; Plastic (for Masonry and Other Structures.

1.04 QUALIFICATION

A. Subcontract the caulking work only to a firm experienced in the application of the types of materials required, and employing skilled tradesmen for the work.

1.05 SUBMISSIONS

A. Submissions shall be in accordance with Section 01300--Submissions, and as modified below.

B. Manufacturer's Data, Sealants and Caulking:

1. Submit three copies of manufacturer's specifications, recommendations, and installation instructions for each type of sealant, caulking compound, and associated miscellaneous material required. Include manufacturer's published data, or letter of certification, or certified test laboratory report indicating that each material complies with the requirements and is intended generally for the applications shown.

C. Samples, Sealants and Caulking:

1. Submit three 12" long samples of manufacturer's standard colors for each type of sealant or caulking compound for selection by Architect.

   Install sample between two strips of material similar to or representative of typical surfaces where sealant or compound will be used, held apart to represent typical joint widths. Samples will be reviewed by Architect for color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

D. Guarantee, Sealants:

1. Submit three copies of written guarantee agreeing to repair or replace sealants which fail to perform as air tight and watertight joints; or fail in joint adhesion, cohesion, abrasion resistance, weather resistance, extrusion resistance, migration resistance, stain resistance, or general durability, or appear to deteriorate in any other manner not clearly specified as in inherent quality of the material by submitted manufacturer's data. Provide guarantee for a period of two years, signed by the installer and Contractor.

PART 2 - MATERIALS

2.01 GENERAL

A. Materials shall conform to the following requirements:

1. Caulking Compound: Caulking compound shall conform to the requirements of Federal Specification TT-C-598, Grade I. The color of the caulking compound shall match the color of the new fascias. Delivery of the caulking compound to the building site shall be in the manufacturer's original sealed packages.

2.02 SAMPLES

A. Samples, before the work of application is started, of all materials proposed for use, two (2) samples of each kind of caulking materials shall be submitted to the Architects for approval.

2.03 SEALANT MATERIALS

A. Compatibility: Provide joint sealers, joint fillers, and other related materials that are compatible with one another and with joint substrates under service and application conditions, as demonstrated by testing and field experience.

B. Colors: Provide color of exposed joint sealers indicated or, if no otherwise indicated, as selected by Architect from manufacturer's standard colors. Color to match window frames.

C. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated,

complying with ASTM C 920 requirements.

D. For exterior and interior caulking between aluminum and concrete masonry:

1. One-part, Non-acid Curing Silicone Sealant: Type S, Grade NS, Class 25, and as follows:

a. Uses NT, M, G, A, and O.

b. Additional capability, when tested per ASTM C 719, to withstand the following percentage changes in joint width as measured at time of application and still comply with other requirements of ASTM C 920.

c. 40 percent movement in both extension and compression for a total of 80 percent movement.

2. Products offered by manufacturers to comply with the requirements include the following:

a. Dow Corning Corp., "Roofseal."

b. 795 Silicone Building Sealant.

E. For exterior and interior caulking between aluminum and aluminum:

1. One-part, Acid Curing Silicone Sealant: Type S, Grade NS, Class 25; Uses NT, G, A, and O.

2. Products offered by manufacturers to comply with the requirements include the following:

a. Down Corning Corp., "Roofseal."

b. 795 Silicone Building Sealant.

2.04 ACCESSORY MATERIALS

A. Premolded Joints for Floors and Paving:

1. Rescor Expansion Joint (W. R. Meadows) or approved equivalent, 1/2-inch thick or as shown; leave 1/2-inch clear space at top to receive sealant.

B. Joint Cleaner:

1. Provide the type of joint cleaning compound recommended by the sealant or caulking compound manufacturer for the joint surfaces to be sealed.

C. Joint Primer:

1. Provide the type of joint priming compound recommended by the sealant or caulking compound manufacturer for the joint surfaces

to be sealed.

D. Bond Breaker Tape:

1. Polyethylene tape or other plastic tape as recommended by the sealant manufacturer to be applied to sealant-contact surfaces where bond to the substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape wherever applicable.

E. Sealant Backer Rod:

1. All joints shown or specified to be sealed or caulked shall be filled with a compressible backer rod of polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable non-absorptive material as recommended for compatibility with sealant by the sealant manufacturer; to control the joint depth for sealant placement, to break bond of sealant at bottom of joint, to form optimum shape of sealant bead on back side, and to provide a highly compressible backer which will minimize the possibility of sealant extrusion when joint is compressed.

PART 3 - EXECUTION

3.01 APPLICATION

A. Caulking compound shall be applied by the gun method using nozzles of proper sizes to fit the several widths of the joints. The type of gun shall be subject to approval by the Architects.

B. Preparation: Caulking in joints shall be a minimum of 3/4-inch in depth and 1/4-inch in width unless otherwise indicated on the drawings.

C. Caulking: The compound shall be driven into the joint grooves with sufficient pressure to force out all air and to solidly fill the joint grooves. Caulking, where exposed, shall be free of wrinkles and shall be uniformly smooth. Upon completion of the caulking, any caulked joints not entirely filled shall be roughened and filled as specified and the exposed surface tooled smooth.

D. Cleaning: The surfaces of all materials adjoining caulked joints shall be cleaned of any smears of compound or other soiling due to the caulking application.

3.02 GUARANTEE

A. All work under this section shall be guaranteed for a period of one (1) year from date of final payment. Should any portion develop imperfections due to faulty workmanship or materials, the Contractor shall repair or replace such portions without delay and at no cost to

the Owner.

3.03 STATEMENT OF NON-COMPLIANCE

A. Wherever it is necessary to proceed with the installation of sealants or caulking compounds under conditions which do not fully comply with the requirements (because of time schedule difficulties or other reasons which the Contractor determine to be crucial to the project, prepare a written statement for the Owner's record (with copies to the Contractor and Architect) indicating the nature of the non-compliance, the reasons for proceeding, the extra or precautionary measures taken to ensure the best possible work, and the names of the individuals concurring with the decision to proceed with the work.

END OF SECTION

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07910 - JOINT SEALERS

PART 1 - GENERAL

1.01 GENERAL

A. Joint sealant to be as per the schedule at the end of this section.

B. Submissions: In addition to product data, submit the following:

1. Samples of each type and color of joint sealer required.

2. Certified test reports for joint sealers evidencing compliance with requirements.

PART 2 - PRODUCTS

2.01 PRODUCTS

A. Compatibility: Provide joint sealers, joint, fillers, and other related materials that are compatible with one another and with joint substrates under service and application conditions, as demonstrated by testing and field experience.

B. Colors: Provide color of exposed joint sealers indicated, or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.

C. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated, complying with ASTM C 920-11 requirements.

1. Two part pourable Polysulfide Sealant: Type M; Grade P; Class 12-1/2'; Uses T, M, G, A, and O.

2. One part non-acid curing Silicone Sealant: Type S, Grade NS, Class 25, and as follows:

a. Uses NT, M, G, A, and O.

b. Additional capability, when tested per ASTM C 719, to withstand the following percentage changes in joint width as measured at time of application and still comply with other requirements of ASTM C 920-11.

c. 40 percent movement in both extension and compression for a total of 80 percent movement.

3. One part acid-curing Silicone Sealant: Type S; Grade NS; Class 25; Uses NT, G, A, and O.

4. One part mildew resistant Silicone Sealant: Type S; Grade NS; Class 25; Uses NT, G, A, and O; formulated with fungicide; intended for sealing interior joints with nonporous substrates exposed to high humidity and temperature extremes.

D. Acrylic Sealant: Manufacturer's standard one-part non-sag, solvent-release-curing, acrylic polymer sealant complying with ASTM C 920-11 for Type S, Grade NS; Uses NT, M, G, A, and O; except for selected test properties which are revised as follows:

Heat-aged hardness: 40-50.
Weight loss: 15 percent.
Max. cyclic movement capability: ±7.5 percent.

E. Acrylic-Emulsion Sealant: Manufacturer's standard, one-part, non-sag, acrylic, mildew-resistant, paintable, acrylic-emulsion sealant complying with ASTM C 834.

F. Foamed-in-place Fire-Stopping Sealant: Two-part, foamed-in-place silicone sealant for use as part of a through-penetration fire-stop system for filling openings around cables, conduit, pipes, and similar penetrations through walls and floors, with fire-resistance rating indicated, per ASTM E 814; listed by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

G. One-part Fire-Stopping Sealant: One part elastomeric sealant formulated for use as part of a through-penetration fire-stop system for sealing openings around cables, conduit, pipes, and similar penetrations through walls and floors, listed by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

H. Sealant Backings, General: Non-staining, compatible with joint substrates, sealants, primers, and other joint fillers; approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

1. Plastic Foam Joint Fillers: Preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam of material indicated below, and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

a. Either flexible, open-cell polyurethane foam or non-gassing, closed-cell polyethylene foam, unless otherwise indicated, subject to approval of sealant manufacturer.

2. Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, non-absorbent to water and gas, capable of remaining resilient at temperatures down to -26°F (-15°C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth and otherwise contribute to optimum sealant performance.

3. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back of joint.

I. Primer: As recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated.

J. Accessory Materials for Fire-Stopping Sealants: Forming, joint fillers, packing, and other accessory materials as required for installation of fire-stopping sealants.

PART 3 - EXECUTION

3.03 EXECUTION

A. General: Comply with joint sealer manufacturer's instructions applicable to products and applications indicated.

B. Elastomeric Sealant Installation Standard: Comply with ASTM C 1193-16 Standard Guide for use of Joint Sealants.

C. Solvent-Release Curing Sealant Installation Standard: Comply with ASTM C 804.

D. Latex Sealant Installation Standard: Comply with ASTM C 790.

E. Acoustical Sealant Application Standard: Comply with ASTM C 919-12(2017) for use of joint sealants in acoustical applications.

F. Installation of Fire-Stopping Sealant: Install sealant, including forming, packing, and other accessory materials to fill openings around mechanical and electrical services penetrating floors and walls to provide fire-stops with fire resistance ratings indicated.

JOINT SEALER SCHEDULE

JOINT SEALERS
DESCRIPTION OF JOINT CONSTRUCTION AND LOCATION WHERE SEALANT IS TYPICALLY APPLIED (SEE NOTE BELOW)

Two-part Pourable Urethane
Exterior and interior joints in Sealant horizontal surfaces of concrete; between metal and concrete, mortar, stone and masonry.

One-part Non-acid Curing
Exterior and interior joints in Silicone Sealant vertical surfaces of concrete and masonry; between concrete masonry or stone; between metal and concrete, mortar or stone; perimeters of metal frames in exterior walls; overhead or ceiling joints; and on interior of glazed curtain wall.

One-Part Acid-Curing Silicone
Exposed joints within glazed Sealant curtain wall framing system, skylight framing system and aluminum entrance framing system.

One-Part Mildew-Resistant
Interior joints in vertical Silicone Sealant surfaces of ceramic tile in toilet rooms, showers, and kitchens.

Acrylic Sealant
Exterior expansion joints in vertical surfaces of brick.

Acrylic-Emulsion Sealant
Interior joints in field-painted vertical and overhead surfaces at perimeter of elevator door frames, hollow metal door frames, gypsum drywall, plaster and concrete or concrete masonry; and all other interior locations not indicated otherwise.

Foamed-in-Place Fire-Stopping
Through penetrations in fire-Sealant resistance-rated floor and wall

assemblies involving multiple pipes, conduits, etc.

One-part Fire-Stopping Sealant
Through penetrations in fire-resistance-rated floor and wall assemblies involving single pipes, conduits where joint widths are narrow and of uniform width.

Note: Install sealant indicated in joints fitting descriptions and locations listed as well as in locations identified by drawing designations in Column One above.

END OF SECTION

DIVISION 8 - DOORS AND WINDOWS

08110 - STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of standard steel doors and frames is indicated and scheduled on drawings.

B. Finish hardware is specified elsewhere in Division 8.

C. Building in of anchors and grouting of frames in masonry construction is specified in Division 4.

1.03 QUALITY ASSURANCE

A. Provide doors and frames complying with Steel Door Institute "Recommended Specifications: Standard Steel Doors and Frames" (SDI-100) and as herein specified.

B. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated or required, provide fire-rated door and frame assemblies that comply with NFPA 80 "Standard for Fire Doors and Windows," and have been tested, listed, and labeled in accordance with ASTM E 152 "Standard Methods of Fire Tests of Door Assemblies" by a nationally recognized independent testing and inspection agency acceptable to authorities having jurisdiction.

1. Oversize Fire-Rated Door Assemblies: For door assemblies required to be fire-rated and exceeding sizes of tested assemblies, provide certificate or label from an approved independent testing and inspection agency, indicating that door and frame assembly conforms to the requirements of design, materials, and construction as established by individual listings for tested assemblies.

2. Temperature Rise Rating: At stairwell enclosures, provide doors which have Temperature Rise Rating of 450°F (232°C) maximum in 30 minutes of fire exposure.

1.04 SUBMISSIONS

A. Product Data: Submit manufacturer's technical product data substantiating that products comply with requirements.

B. Shop Drawings: Submit for fabrication and installation of steel

doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections.
Show anchorage and accessory items.

1. Provide schedule of doors and frames using same reference numbers for details and openings as those on contract drawings.

2. Indicate coordination of glazing frames and stops with glass and glazing requirements.

C. Samples: Full range of color samples for Architect selection; 2 samples, 6" square minimum, of each color and texture selected for factory finished doors and frames.

D. Label Construction Certification: For door assemblies required to be fire-rated and exceeding sizes of tested assemblies, submit manufacturer's certification for that each door and frame assembly has been constructed to conform to design, materials, and construction equivalent to requirements for labeled construction.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work cartoned or crated to provide protection during transit and job storage. Provide additional sealed plastic wrapping for factory finished doors.

B. Inspect hollow metal work upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.

C. Store doors and frames at building site under cover. Place units on minimum 4" high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4" spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames by one of the following:

1. Steel Doors and Frames, (General):

Allied Steel Products, Inc.
Amweld/Div. American Welding & Manufacturing Co.
Ceco Corporation.
Copco Door Company.
Curries Manufacturing, Inc.
Dittco Products, Inc.
Fenestra Corporation.

Kewanee Corporation.
Mesker Industries, Inc.
Pioneer Builders Products Corporation/Div. CORE Industries, Inc.
Steelcraft/Div. American Standard Company.
Trussbilt, Inc.
Republic Builders Products Corporation/Subs. Republic Steel.

2.02 MATERIALS

A. Hot-rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A 569 and ASTM A 568.

B. Cold-rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 366 and ASTM A 568.

C. Galvanized Steel Sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A 526, with ASTM A 525, G60 zinc coating, mill phosphatized.

D. Supports and Anchors: Fabricate of not less than 18 gauge galvanized sheet steel.

E. Inserts, Bolts, and Fasteners: Manufacturer's standard units, except hot-dip galvanize items to be built into exterior walls, complying with ASTM A 153, Class C or D as applicable.

F. Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints.

G. Finish: For all doors indicated as prefinish, provide manufacturer's standard baking epoxy or enamel paint. All other doors to be finished as described in Division 9 - Section 09900.

2.03 FABRICATION, GENERAL

A. Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp, or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at project site. Comply with SDI-100 requirements as follows:

1. Interior Doors: SDI-109, Grade II, heavy-duty, Model 1, minimum 18-gauge faces, and Model 5, minimum 16 gauge steel. Refer to door schedule for locations.

2. Exterior Doors: SDI-100, Grade III, extra heavy-duty, Model 2, minimum 16-gauge faces, and Model 5, 16 gauge steel. Refer to door schedule for locations.

B. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel.

C. Fabricate frames, concealed stiffeners, reinforcement, edge channels,

louvers, and moldings from either cold-rolled or hot-rolled steel (at fabricator's option).

D. Fabricate exterior doors, panels, and frames from galvanized sheet steel. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 16-gauge inverted steel channels. Edge seams shall be welded, filled, and ground smooth.

E. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat Phillips heads for exposed screws and bolts.

F. At exterior locations and elsewhere as shown or scheduled, provide doors which have been fabricated as thermal insulating door and frame assemblies and tested in accordance with ASTM C 236.

1. Unless otherwise indicated, provide thermal-rated assemblies with U-factor of 0.24 BTU /(hr*ft sq deg F) or better.

G. Finished Hardware Preparation: Prepare doors and frames to receive mortised and concealed finish hardware in accordance with final Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 series specifications for door and frame preparation for hardware.

H. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied finish hardware may be done at project site.

I. Locate finish hardware as indicated on final shop drawings or, if not indicated, in accordance with "Recommended Locations for Builder's Hardware," published by Door and Hardware Institute.

J. Clean, treat, and paint exposed surfaces of steel door and frame units, including galvanized surfaces.

K. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.

L. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.

M. Apply finish coat to doors indicated as prefinished by electrostatically spraying and baking, to produce a paint thickness of 1.25 mils.

2.04 STANDARD STEEL DOORS

A. Provide metal doors of types and styles indicated on drawings or schedules.

B. Provide sightproof stationary louvers for interior doors where indicated, constructed of inverted V-shaped or Y-shaped blades formed of 24-gauge cold-rolled steel set into 20-gauge steel frame.

2.05 STANDARD STEEL FRAMES

A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 16-gauge cold-rolled furniture steel.

B. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single-swing frames and 2 silencers on heads of double-swing frames.

C. Plaster Guards: Provide 26-gauge steel plaster guards or mortar boxes, welded to frame, at back of finish hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install standard steel doors, frames, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.

B. Placing Frames: Comply with provisions of SDI-105 "Recommended Erection Instructions for Steel Frames," unless otherwise indicated.

1. Except for frames located at in-place concrete or masonry and at drywall installations, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.

2. In masonry construction, locate 3 wall anchors per jamb at hinge and strike levels.

3. At in-place concrete or masonry construction, set frames and secure to adjacent construction with machine screws and masonry anchorage devices.

4. Install fire-rated frames in accordance with NFPA Std. No. 80.

5. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In open steel stud partitions, place studs in wall anchor notches and wire tie. In closed steel stud partitions, attach wall anchors to studs with tapping screws.

C. Fit hollow metal doors accurately in frames, within clearances specified in SDI-100.

D. Place fire-rated doors with clearances as specified in NFPA Standard No. 80.

3.02 ADJUST AND CLEAN

A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

B. Protection Removal: Immediately prior to final inspection, remove protective plastic wrappings from prefinished doors.

C. Final Adjustments: Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and incomplete and proper operating conditions.

END OF SECTION

DIVISION 8 - DOORS AND WINDOWS

SECTION 08211 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The extent and location of each type of wood door is shown on drawings and schedules.

B. The types of doors required include the following:

1. Solid core flush wood doors, with wood-veneer faces.

2. Fire rated flush wood doors.

3. Factory-finished flush wood doors.

C. Related Sections:

1. Section 08110 - Steel Doors and Frames.
2. Section 08112 - Custom Steel Doors and Frames.
3. Section 08710 - Finish Hardware.
4. Section 08800 - Glass and Glazing.
5. Section 09900 - Painting.

D. Related Documents: Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 QUALITY ASSURANCE

A. In addition to the requirements shown on the drawings and specified in this section, comply with the following standards:

1. AWI "Quality Standards illustrated", Section 01300 and Brochure No. 5 "Flush Doors" of the Architectural Woodwork Institute.

2. NWMA "Industry Standard I.S. 1-73 "Wood Flush Doors" of the National Woodwork Manufacturer's Association.

3. NFPA 80 "Standard for Fire Doors and Windows' of the National Fire Protection Association.

4. NWWDA “Guide to Door Face Veneers”.

B. Source Limitations: Obtain flush wood doors through one source from a single manufacturer.

1. Provide AWI Quality Certification Labels, or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.

C. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated or required, provide fire-rated door and frame assemblies that comply with NFPA 80 "Standard for Fire Doors and Windows," and

have been tested, listed, and labeled in accordance with ASTM E 152 "Standard Methods of Fire Tests of Door Assemblies" & NFPA 252 "Standard Methods of Fire Tests of Door Assemblies" of the National Fire Protection Association by a nationally recognized independent testing and inspection agency acceptable to authorities having jurisdiction.

1. Test Pressure: After 5 minutes into the test, the neutral pressure level in furnace shall be established at 40 inches or less above the sill.

2. Temperature-Rise Rating: At exit enclosures, provide doors that have a temperature-rise rating of 450 deg. F maximum in 30 minutes of fire exposure.

D. ASTM E119 "Standard Test Methods for Fire Tests of Building Construction Materials".

1.03 SUBMITTALS

A. Comply with the requirements of Section 01300 and as modified below.

B. Manufacturer's Data:

1. Submit six (6) copies of manufacturer's product data, specifications, and installation instructions for each type of wood door required. Data shall include details of core and edge construction and trim for openings. Include factory-finishing specifications.

2. Submit six (6) copies of manufacturer's certificate indicating that doors and louvers meet, or exceed, requirements of indicated fire rating.

C. Shop Drawings: Submit three samples, minimum 12" x 12", showing veneer, core, and edge construction for each type of wood door required. Indicate location, size, and hand of each door, elevation of each kind of door, construction details not covered in Product Data; location and extent of hardware blocking and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.

2. Indicate dimensions and locations of cutouts.

3. Indicate requirements for veneer matching.

4. Indicate doors to be factory finished and finish requirements.

5. Indicate fire ratings for fire doors.

D. Samples for Initial Selection: Color charts consisting of actual materials in small sections for the following:

1. Faces of Factory-Finished Doors: Show the full range of options available for stained and transparent finishes.

E. Samples for Verification:

1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.

    1. Frames for light openings, 6 inches long, for each material, type and finish required.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheet. Mark each door on top and bottom rail with opening number used in shop drawings.

C. Protect wood doors during transit, handling, and storage to prevent damage, soiling, and deterioration. Store in a dry location and stack in accordance with manufacturer's instructions.

D. Provide protective coverings for shop finished doors at the factory prior to shipping. Use heavy paper cartons and mark with identification required for proper installation.

1.05 QUALITY STANDARD

A. Comply with NWWDA I.S. 1-A "Architectural Wood Flush Doors, and AWI's "Architectural Woodwork Quality Standards Illustrated".

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.07 WARRANTY

A. Submit three copies of written agreement in door manufacturer's standard form signed by the manufacturer, installer, and Contractor agreeing to repair or replace doors that are defective in materials or workmanship, have warped (bow, cup or twist) more whan ¼ inch in a 42-by-84-inch section, or show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.

B. The warranty shall include refinishing and reinstallation which may be required due to repair or replacement of defective doors.

C. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.

D. Warranty shall be in effect during the following period of time from date of Substantial Completion.

    a. Solid-Core Interior Doors: Life of Installation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design: The design for flush wood doors is based on Mohawk Flush Doors, Inc. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

1. Eggers Industries, Two Rivers, Wisconsin.

2. Algoma Hardwoods, Inc., Algoma, Wisconsin.

3. Marshfield Door Systems, Inc., Marshfield, Wisconsin.

2.02 INTERIOR FLUSH DOORS

A. Comply with applicable requirements of AWI 1300.

B. Face Veneer: Match existing veneer and finish, unless otherwise specified. Provide "*Mohawk Platinum Series 7-ply Architectural Flush Doors*."

1. AWI quality grade: Grade A, plain sliced white oak or maple, book match (match for color and grain) at veneer joints. Provide exposed edges or other exposed solid wood components of the same species as face veneer. Veneers are to be white only (color contract heartwood/sapwood) will not be acceptable).

2. Faces for transparent finish: AWI Specification System 1 filled finish; match veneer of existing doors.

C. Door Construction: Solid core, AWI Type Solid Composite Lumber Core (SCLC) for non-rated doors and 20 minute rated doors and/or Mineral Core (MC) for 45 minute, 60 minute and 90 minute rated doors. Five (5) plies with stiles and rails bonded to core; then entire unit to be abrasive-planed before veneering.

1. Special edge construction (for Mineral Core [MC] fire rated doors): 5" top rail; 5" bottom rail, and 5" x 18" lock blocks both sides. At hinge stiles, provide manufacturer's standard laminated-edge construction with improved screw-holding capability and split resistance and with outer stile matching face veneer. At pairs, furnish formed-steel edges and astragals for pairs of fire-rated doors, unless otherwise indicated. Provide finish steel edges and astragals with baked enamel same color as doors.

2. Wood fire doors (similar or equal to Mohawk Platinum Series 7-ply Architectural Flush Doors) must be installed in a rated hollow metal (h.m.) frame (i.e., 3/4 hour – C labeled; 1-1/2 hour – B labeled). Door construction and core specified above for type of face indicated or manufacturer's standard mineral-core construction as needed to provide fire rating indicated.

a. Blocking: For mineral-core doors, provide composite blocking with improved screw-holding capability approved for use in

doors of fire ratings indicated:

1. 5-inch top-rail blocking.
2. 5-inch bottom-rail blocking.
3. 5-inch mid-rail blocking with 5-by-10-inch lock blocks.

b. At pairs of fire-rated doors, provide fire-retardant stiles matching face veneer that are labeled and listed for kinds of applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals.

3. In accordance with NFPA-80, Section 1-7, Glazing Material, Fire protection rated glazing (vision panels) must be installed in approved steel frames.

a. Glazing for openings through doors, such as ceramic fire rated safety glass, shall be fitted into trim openings and well embedded in putty.

D. Louvers:

1. Wood louvers: Provide door manufacturer's standard solid wood louvers, unless otherwise indicated; size indicated on drawings or in schedule.

2. Metal louvers: Unless otherwise specified provide minimum 20 gauge steel with prime and finish coats of enamel; color to match sample furnished by Architect; size as indicated on drawings or in schedule. Blade type to be vision-proof, inverted V. Metal and finish to be galvanized steel, 0.0396 inch thick, hot-dip zinc – coated and factory-primed for paint finish.

3. For fire-rated doors, louver must be fire rated with U.L. label and equipped with a (stainless steel) spring operated 160° fusible link and closing device, listed and labeled for use in doors with fire rating of one and one-half hours and less. Metal and finish to be galvanized steel, 0.0396 inch thick, hot-dip zinc coated and factory-primed for paint finish.

4. Where indicated to be lightproof, provide lightproof overlapping channel blade louvers, similar to the following:

a. "Model 1000 Lightproof Overlapping Channel Blade Louver" by Air Louvers, Inc.

b. "Model 619 Lightproof Formed Metal Stationary Louver" by AiroLite Co., Marietta, Ohio.

c. "Model LP-1 Lightproof Louver" by Wonder Metals Corp., Redding, Ca.

E. Wood Beads for Light Openings in Wood Doors:

1. Wood Species: Same as species as door faces.

2. Profile: Flush rectangular beads.

3. At 20-minute, fire-rated, wood-core doors, provide wood beads and

metal glazing clips approved for such use.

F. Wood-Veneered Beads for Light Openings in Fire Doors: Manufacturer's standard wood-veneered non-combustible beads matching veneer species of door faces and approved for use in doors of fire rating indicated. Include concealed metal glazing clips where required for opening size and fire rating indicated.

G. Adhesives: Do not use adhesives containing urea formaldehyde.

H. Doors for Transparent Finish:

1. Grade: Premium, with Grade A faces.

2. Species and Cut: Birch, plain sliced.

3. Match between Veneer Leaves: Book match.

4. Assembly of Veneer Leaves on Door Faces: Center balance match.

5. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.

a. Room Match: Match door faces within each separate room or area of building. Corridor door faces do not need to match where they are separated by 20 feet or more.

b. Stiles: Same species as faces.

2.03 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels, unless otherwise indicated:

1. Comply with clearance requirements of referenced quality standard for fitting.

2. Comply with requirements in NFPA 80 for fire-rated doors.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.

1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.

2. Metal Astragals: Pre-machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.

C. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) for door(s) required.

1. Light Openings: Trim openings with moldings of material and profile indicated.

2. Louvers: Factory install louvers in prepared openings.

2.04 FACTORY FINISHING

A. General: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated" for factory finishing.

B. Finish all door surfaces at factory.

C. Transparent Finish:

1. Grade: Premium.
2. Finish: AWI System, TR-6 catalyzed polyurethane.
3. Staining: As selected by the Architect from the entire series of colors.
4. Effect: Open-grain finish.
5. Sheen: Semi-gloss.

D. Restore finish on all edges of shop-finished doors before installation.

E. Drips and runs of paint, stain, primer, or sealer are not acceptable.

2.05 FIRE RATED DOORS

A. Comply with applicable requirements of AWI 1300 and NFPA 80 "Standard for Fire Doors and Windows" for fire ratings indicated on drawings and in schedule.

B. Provide doors which have been tested and rated by Underwriter's Laboratories, Inc. (UL) for the fire ratings and class indicated in the schedule using single-point hardware.

1. Attach UL classification Marking label indicating door type, rating, class, and temperature rise to edge of each fire-rated door.

C. Provide veneer and finish to match non-fire-rated doors in the same area of building, unless otherwise indicated.

D. Door assemblies in corridors and smoke barriers shall be tested in accordance with NFPA 252 or UL 10C

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine doors and installed door frames prior to hanging doors.

1. Verify that framed comply with indicated requirements for type, size, location and swing characteristics and have been installed with level heads and plumb jambs.

B. Proceed with installation, only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Condition doors to average prevailing humidity in installation area

prior to hanging.

B. Fit doors to frames and machine for hardware.

3.03 INSTALLATION

A. Install wood doors in accordance with manufacturer's instructions. Adjust for proper fit, uniform clearance at each edge, and smooth balanced door movement. For installation of finish hardware, refer to Section 08710.

B. Provide clearance for doors of 3/32" at jambs and heads and 3/8" at bottom, unless otherwise indicated.

1. For fire rated doors, provide clearances complying with the limitation of the authority having jurisdiction. Install fire-rated doors into corresponding fire-rated frames, according to NFPA 80.

2. Allow extra clearance as required for thresholds, carpet, and similar materials.

C. Job-fitted use: Align and fit doors in frames with a uniform clearances and bevels as indicated below. Do not trim stiles and rails in excess of limits set by the manufacturer or permitted for fire-rated doors. Machine doors for hardware; seal cut surfaces after fitting and machining.

D. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold.

E. Comply with NFPA 80 for fire-rated doors.

F. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.

G. Bevel fire-rated doors 1/8 inch in 2 inches at lock edge; trim stiles and rails only to extent permitted by labeling agency.

H. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.04 ADJUSTING

A. Operation: Re-hang or replace doors what do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if work complies with the requirements and shows no evidence of repair or refinishing.

END OF SECTION

DIVISION 8 - DOORS AND WINDOWS

SECTION 08306 - FIRE RATED ACCESS DOORS

PART 1 - GENERAL

1.01 SCOPE

A. Provide all labor, materials, and equipment necessary to provide fire rated (B labeled) access doors where shown on the drawings and as specified herein.

B. All required modifications to the floor slab to properly install extruded aluminum access door frame with anchor flange.

1.02 SUBMITTALS

A. Submit complete shop drawings indicating all specified sizing, dimensions, and testing criteria for a 2 hour (B labeled) fire access door.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Fire-rated access doors shall be as manufactured by the Bilco Company, Model FR4 (3'-0" x 3'-0") as supplied by Fontano Metal Sales, Inc., (516) 231-7030, or approved equal by the Architect.

B. Door and frame assembly shall be tested in accordance with ASTM F 119 and UL listed for a 2-hour fire rating when exposed to fire from the underside.

C. Door leaf shall have a 1" fillable pan to receive concrete and finish floor material specified on the drawings. Note: Finish flooring material up to 3/8" thick can be installed in the 1" pan. The remaining depth must be filled with concrete to maintain fire rating of door assembly. In all cases, the Contractor must specify type, thickness and weight of intended fill material so that compression spring operators can be factory adjusted for smooth, easy operation.

D. Door leaf shall be constructed of 1/4" aluminum and built to withstand a live load of 150 lbs/ft^2.

E. Frame shall be 1/4" extruded aluminum with neoprene cushion and continuous anchor frame.

F. Door shall be equipped with a hydraulic hold-open system to automatically hold the door in the open position. A self-contained pneumatic system will automatically close and latch the door leaf in the event of fire.

G. Compression spring operators enclosed in telescopic tubes shall be provided for smooth, easy operation throughout the entire arc of opening and closing. Continuous hinge shall be heavy duty Type 316 stainless steel. A Type 316 stainless steel slam latch with gasketed cover plug and removable turn handle (top side) and cable release handle (underside) shall be provided.

H. Factory finish shall be mill finish aluminum with bituminous coating applied to the exterior of the frame.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Door assembly shall be installed in a UL listed, fire rated floor/ceiling assembly.

B. Complete installation shall be in strict accordance with approved shop drawings and manufacturer's installation instructions.

3.02 GUARANTEE

A. Manufacturer shall guarantee against defects in material and workmanship for a period of five (5) years.

END OF SECTION

DIVISION 8 - DOORS AND WINDOWS

SECTION 08330 - ROLL-UP DOOR COILING FIRE DOORS

PART 1 - GENERAL

1.01 GENERAL

A. Applicable provisions of the General and Special Conditions of the Contract shall govern all work under this Section.

1.02 SCOPE

A. Provide all labor, materials, equipment, and services and perform all operations required to complete the installation of all work of this section and related work indicated on the drawings and specified herein, including, but not necessarily limited to, the following:

1. Roll-up coiling overhead fire doors (1 1/2-hour [B labeled] – UL listed) in location indicated on drawings.

2. All operators, controls, hardware, weatherstripping, etc., required for a complete installation.

B. Related work to be performed under other sections or contracts:

1. All electrical connections, wiring, etc.--see Division 16 - Electrical.

1.02 SHOP DRAWINGS

A. Submit shop drawings for approval in compliance with the applicable provisions of the General and Special Conditions of the Contract.

1. Drawings shall indicate details of fabrication and installation.

2. Include dimensions, gauges, material, method of anchoring in relation to adjacent construction.

3. Electrical diagrams of operators and controls showing installation instructions.

PART 2 - MATERIALS

2.01 CHAIN OPERATED ROLL-UP COILING FIRE DOORS

A. Doors shall be of sizes in locations as indicated on drawings and be Model No. CLF-5F with M58 Releasing Device and M105A Annunciator as manufactured by the Cornell Iron Works or other approved equal doors will be accepted, provided they meet the following specifications:

1. Curtain: Consisting of No. 5F interlocked flat faced slats. Slat shall be stainless steel (18 gauge) in accordance with ASTM standards. Slats shall be 3/4-inch having a flame spread rating of 0-25 in accordance with ASTM E-84 applied to the inside face of the exterior curtain slats and closed on the inside face with a 22 gauge galvanized steel facer sheet. Bottom of curtain shall be reinforced with two (2) galvanized steel angles (2" x 2" x 1/8" min.) with polyester (gray) enamel coated stainless steel. Bottom bar shall also have UL listed nylon pile smoke seals. End locks shall be riveted to ends of slats per UL procedure.

2. Brackets: Minimum 1/4-inch thick steel plate, having stiffening rib around contour. Brackets shall have ball or roller bearings at rotating support points, bolted to extension guide wall angles to support counterbalance shaft assembly and form end closures.

3. Guides: Fabricated from 3/16-inch minimum thick angles with continuous neoprene UL listed nylon pile smoke seals. Provide windlock bars. Attach guides to jambs with not less than 3/8-inch diameter steel bolts spaced not less than 18 inches o.c. per Underwriters Laboratory Factory Mutual (FM) procedures.

4. Barrel: Steel housing with counterbalancing springs and supporting curtain. Under load, it will not exceed .03 inch per linear foot deflection.

5. Counterbalance: Oil tempered steel helical torsion counterbalance springs. Cast iron spring anchors, steel torsion shaft, and spring tension wheel. All springs shall act on a single torsion shaft and receive equal, simultaneous angular adjustment from the tension wheel outside one bracket. Torsion spring assembly shall be designed to insure that maximum door operation effort shall not exceed 35 pounds. Provide wheel outside of end bracket for applying spring torque and for future adjustment.

6. Hood: 24 gauge minimum hot dipped galvanized sheet metal. Internally reinforced to maintain rigidity and shape with stiffening beads or flanges. Lintel shall be equipped with UL listed nylon pile smoke seals.

7. Bearings: Permanently grease-sealed and support the pipe and curtain.

8. All ferrous surfaces, except working parts of machinery, shall be chemically treated and receive a factory coat of rust inhibitive primer.

B. Operation: All roll-up fire doors shall be hand chain operated for 35 pound maximum pull.

1. All roll-up fire doors shall be equipped with automatic closure and "Saf-T-Gard" speed governor and shall be activated

by melting of fusible link and the operation UL listed Electro-magnetic Releasing Device Model No. M58. Doors shall close at an average speed of not less than 6 inches per second and not more than 24 inches per second.

2. Furnish all roll-up fire doors with an audible and visual warning annunciator Model No. M105A, which warns occupants that the overhead coiling door is about to close.

C. Finishes:

1. Galvanized steel curtain slat and hoods shall be finished with baked-on light gray polyester enamel curtain slats galvanized and phosphate treated for paint adhesion. Bottom bar and guides to be plain steel with a gray ASA 61 fusion bonded polyester powder coating. Powder coating is applied to a minimum of 2-1/2 mils cured film thickness. Other exposed plain steel parts primed gray with a powder coated finish. All stainless steel to be provided with a No. 4 satin finish. All exposed finishes shall be stainless steel as selected by the Architect.

PART 3 - EXECUTION

3.01 ERECTION

A. Furnish and install all doors and necessary support angles as indicated on the drawings. Installation shall be performed by qualified personnel in strict accordance with the manufacturer's instructions and approved shop drawings.

B. Installation shall be in accordance with the National Fire Protection Association standard for fire doors and windows – NFPA 80.

C. Doors shall be tested and witnessed for normal and automatic operation after installation is complete.

END OF SECTION

DIVISION 8 - DOORS AND WINDOWS

SECTION 08410 – ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.01 DESCRIPTION:

A. The extent of aluminum doors and frames is shown on the drawings.

B. The types of aluminum doors and frames include the following:

1. Aluminum entrance assemblies.

C. Related Documents: Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

Related work specified elsewhere:
1. Section 07900 - Caulking and Sealants.
2. Section 08710 - Finish Hardware.
3. Section 08800 - Glass and Glazing.
4. Section 08520 - Aluminum Windows

1.02 PEFORMANCE REQUIREMETNS:

A. System Description – General: Provide aluminum entrance and storefront systems capable of withstanding loads and thermal and structural movement requirements indicated without failure, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project. Failure includes the following:

1. Air infiltration and water penetration exceeding specified limits.

2. Framing members transferring stresses, including those caused by thermal and structural movement, to glazing units.

B. Glazing: Physically and thermally isolate glazing from framing members.

C. Structural Silicone-Sealant Joints: Provide systems with structural silicone-sealant joints complying with the following requirements:

1. Tensile or shear stress in joints is less than 20 psi.

2. Structural sealant withstands tensile and shear stresses imposed by storefront systems without failing adhesively or cohesively. When tested for adhesive compatibility with each substrate and condition required, provide sealant that fails cohesively before it fails adhesively. Adhesive and cohesive

failure are defined as follows:

Adhesive failure occurs when sealant pulls away from a substrate cleanly, leaving no sealant material behind.

Cohesive failure occurs when sealant breaks or tears within a joint but does not separate from each substrate because sealant-to-substrate bond strength exceeds sealant's internal strength.

D. Wind Loads: Provide entrance and storefront systems, including anchorage, capable of withstanding wind-load design pressures calculated according to requirements of the 2020 International Building Code or the American Society of Civil Engineers' ASCE 7, "Minimum Design Loads for Buildings and Other Structures," 6.4.2, "Analytical Procedure," whichever are more stringent. Refer to drawings for Wind Design Data.

E. Deflection of framing members in a direction normal to wall plane is limited to 1/175 of clear span or 3/4 inch, whichever is smaller, unless otherwise indicated.

F. Static-Pressure Test Performance: Provide entrance and storefront systems that do not evidence material failures, structural distress, failure of operating components to function normally, or permanent deformation of main framing members exceeding 0.2 percent of clear span when tested according to ASTM E 330.

G. Test Pressure: 150 percent of inward and outward wind-load design pressures.

H. Duration: As required by design wind velocity; fastest 1 mile of wind for relevant exposure category.

I. Seismic Loads: Provide entrance and storefront systems, including anchorage, capable of withstanding the effects of earthquake motions calculated according to requirements of authorities having jurisdiction or ASCE 7, "Minimum Design Loads for Buildings and Other Structures," Section 9, "Earthquake Loads," whichever are more stringent.

J. Dead Loads: Provide entrance- and storefront-system members that do not deflect an amount which will reduce glazing bite below 75 percent of design dimension when carrying full dead load.

K. Provide a minimum 1/8-inch clearance between members and top of glazing or other fixed part immediately below.

L. Live Loads: Provide entrance and storefront systems, including anchorage, that accommodate the supporting structures' deflection from uniformly distributed and concentrated live loads indicated without failure of materials or permanent deformation.

M. Air Infiltration: For single acting offset pivot or butt hung entrances in the closed and locked position, the test specimen shall be tested in accordance with AAMA/WDMA/CSA101/I.S.2/A440 or NFRC 400 entrance door and frame shall not exceed 0.20 cfm per square foot per Table C402.5.2 of the 2020 Energy Conservation Code.

N. Water Penetration: Provide entrance and storefront systems that do not evidence water leakage through fixed glazing and frame areas when tested according to ASTM E 331 at minimum differential pressure of 20% of inward-acting wind-load design pressure as defined by ASCE 7, "Minimum Design Loads for Buildings and Other Structures," but not less than 6.24 lbf/sq. ft. Water leakage is defined as follows:

> Uncontrolled water infiltrating systems or appearing on systems' normally exposed interior surfaces from sources other than condensation. Water controlled by flashing and gutters that is drained back to the exterior and cannot damage adjacent materials or finishes is not water leakage.

O. Thermal Movements: Provide entrance and storefront systems, including anchorage, that accommodate thermal movements of systems and supporting elements resulting from the following maximum change (range) in ambient and surface temperatures without buckling, damaging stresses on glazing, failure of joint sealants, damaging loads on fasteners, failure of doors or other operating units to function properly, and other detrimental effects.

P. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

Q. Structural-Support Movement: Provide entrance and storefront systems that accommodate structural movements including, but not limited to, sway and deflection.

Structural: Corner strength shall be tested per Kawneer’s dual moment load test procedure and certified by an independent testing laboratory to ensure weld compliance and corner integrity [Testing procedure and certified test results available upon request].

R. Condensation Resistance Factor (CRF): When tested to AAMA Specification 1503.1, the condensation resistance factor shall not be less than 52.

S. Entrance Door Thermal Transmittance Coefficient (U-factor): When tested to ASTM C236 and AAMA Specification 1503.1, the conductive thermal transmittance (U-factor) shall not be more than 0.61 BTU/hr/sf/°F.

T. Aluminum-framed storefront system Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than:
   1. Glass to Exterior – 0.38 (low-e) BTU/hr/ft2/°F.
   2. Glass to Center – 0.38 (low-e) BTU/hr/ft2/°F.
   3. Glass to Interior – 0.38 (low-e) BTU/hr/ft2/°F.

U. Solar Heat Gain Coefficient (SHGC): The glazing solar heat gain coefficient (SHGC) shall not be more than 0.36.

V. Surface Burning Characteristics, FRP Doors and Panels, ASTM E 84:
   1. Flame Spread: Maximum of 200, Class C.
   2. Smoke Developed: Maximum of 450, Class C.

W. Surface Burning Characteristics, Class A Option On Interior Faces of FRP Exterior Panels and Both Faces of FRP Interior Panels, ASTM E 84:
   1. Flame Spread: Maximum of 25.
   2. Smoke Developed: Maximum of 450.

X. Impact Strength, FRP Doors and Panels, Nominal Value, ASTM D 256: 14.0 foot-pounds per inch of notch.

Y. Tensile Strength, FRP Doors and Panels, Nominal Value, ASTM D 638: 13,000 psi.

Z. Flexural Strength, FRP Doors and Panels, Nominal Value, ASTM D 790: 21,000 psi.

AA. Water Absorption, FRP Doors and Panels, Nominal Value, ASTM D 570: 0.20 percent after 24 hours.

BB. Indentation Hardness, FRP Doors and Panels, Nominal Value, ASTM D 2583: 55.

CC. Gardner Impact Strength, FRP Doors and Panels, Nominal Value, ASTM D 5420: 120 in-lb.

DD. Abrasion Resistance, Face Sheet, Taber Abrasion Test, 25 Cycles at 1,000 Gram Weight with CS-17 Wheel: Maximum of 0.029 average weight loss percentage.

EE. Stain Resistance, ASTM D 1308: Face sheet unaffected after exposure to red cabbage, tea, and tomato acid. Stain removed easily with mild abrasive or FRP cleaner when exposed to crayon and crankcase oil.

FF. Chemical Resistance, ASTM D 543. Excellent rating.
   1. Acetic acid, Concentrated.
   2. Ammonium Hydroxide, Concentrated.
   3. Citric Acid, 10%.
   4. Formaldehyde.
   5. Hydrochloric Acid, 10%

6. Sodium hypochlorite, 4 to 6 percent solution.

GG. Compressive Strength, Foam Core, Nominal Value, ASTM D 1621: 79.9 psi.

HH. Compressive Modulus, Foam Core, Nominal Value, ASTM D 1621: 370 psi.

II. Tensile Adhesion, Foam Core, Nominal Value, ASTM D 1623: 45.3 psi.

JJ. Thermal and Humid Aging, Foam Core, Nominal Value, 158 Degrees F and 100 Percent Humidity for 14 Days, ASTM D 2126: Minus 5.14 percent volume change.

1.02 QUALITY ASSURANCE:

A. The aluminum/FRP doors, frames, and associated work shall be done by a single firm specializing in the type of work required, so that there will be undivided responsibility for the specified performance of all component parts, including the following:

1. Glazing of aluminum/FRP doors.

2. Installation of all hardware.

B. Details shown are based upon standard details by one manufacturer. It is intended that similar details by other manufacturers will be acceptable, provided they comply with the size requirements, with minimum/maximum profile requirements as shown, and with the specified structural and performance requirements.

C. Installer Qualifications: Engage an experienced installer to assume engineering responsibility and perform work of this Section who has specialized in installing entrance and storefront systems similar to those required for this Project and who is acceptable to manufacturer.

D. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction, approving acceptable installer and approving application method.

E. Engineering Responsibility: Prepare data for entrance and storefront systems, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

F. Source Limitations: Obtain each type of entrance and storefront system through one source from a single manufacturer.

G. Product Options: Drawings indicate size, profiles, and dimensional requirements of entrance and storefront systems and are based on the specific systems indicated. Other manufacturers' systems with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."

H. Do not modify intended aesthetic effect, as judged solely by Architect, except with Architect's approval and only to the extent needed to comply with performance requirements. Where modifications are proposed, submit comprehensive explanatory data to Architect for review.

I. Preconstruction Sealant Testing: Perform sealant manufacturers' standard tests for compatibility and adhesion of sealants with each material that will come in contact with sealants and each condition required by system.

J. Test a minimum of 8 samples of each metal, glazing, and other material.

K. Prepare samples using techniques and primers required for installed systems.

L. Perform tests under environmental conditions that duplicate those under which systems will be installed. For materials that fail tests, determine corrective measures required to prepare each material to ensure compatibility with and adhesion of sealants, including, but not limited to, specially formulated primers. After performing these corrective measures on the minimum number of samples required for each material, retest materials.

M. Welding Standards: Comply with applicable provisions of AWS D1.2, "Structural Welding Code--Aluminum."

1.03 SUBMISSIONS:

A. Submissions shall be in accordance with Section 01300: Submissions and as modified below.

B. Product Data:

1. Submit manufacturer's specifications, standard details, and installation recommendations for components of aluminum door and frame assemblies required for the project.

2. Maintenance Manual: Submit three copies of bound maintenance manual for aluminum door and frame assemblies, including manufacturer's product literature on all components and manufacturer's instructions for cleaning, repair, and general maintenance of all components.

C. Shop Drawings:

1. Submit shop drawings for the fabrication and installation of aluminum entrance assemblies and associated components of the work. Include plans, elevations, sections, details of components, provisions for expansion and contraction, and attachments to other work. Show anchors, hardware, operators, and other components not included in manufacturer's standard

data, including glazing details. Include hardware schedule and indicate operating hardware types, quantities, and locations.

D. Samples:

1. Submit three samples of each required aluminum finish on 12" long extrusions or 6" square sheets of the alloys to be used for the work. Where normal color and texture variations are to be expected, include two or more units in each samples to show the range of such variations. Samples will be reviewed by the Architect for color and texture only. Compliance with other requirements is the exclusive responsibility of the Contractor.

E. Installer Certificates: Submit installer certificates signed by manufacturer, certifying that installers comply with specified requirements.

F. Product Test Reports: Based on evaluation of tests performed by manufacturer and witnessed by a qualified independent testing agency, indicate compliance of entrance and storefront systems with requirements based on comprehensive testing of current systems. Submit certified test reports showing compliance with specified performance characteristics for framing and door components. Provide tests reports certified with an ICC-Evaluation Service Test Report for FRP doors when required.

1.04 GUARANTEE:

A. Submit two copies of written guarantee signed by the manufacturer, installer, and contractor, agreeing to replace aluminum entrance assemblies, window units, and components which fail in materials or workmanship within three years of date of acceptance. Failure of materials or workmanship shall include (but not be limited to) excessive leakage or air infiltration, excessive deflections, delamination of panels, deterioration of finish or metal in excess of normal weathering, and defects in accessories, weatherstripping, and other components of the work.

1.05 PROJECT CONDITIONS:

A. Field Measurements: Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.06 DELIVERY, STORAGE AND HANDLING:

A. Ordering: Comply with the manufacturer’s ordering instructions and lead-time requirements to avoid construction delays.

B. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.

C. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle entrance doors and components to avoid damage. Protect entrance doors against damage from elements, construction activities, and other hazards before, during and after entrance installation.

1.07 CLEANING AND PROTECTION:

A. The Contractor shall maintain the doors, frames, and side light components in a reasonably clean condition throughout the construction period, so that it will be without any evidence of deterioration or damage (other than the effects of normal weathering) at the time of final acceptance. Select methods of cleaning which will promote the achievement of uniform appearance and stabilized colors and textures for materials that weather or age with exposure.

B. The door installer shall advise the General Contractor to proper and adequate means for protecting portions of the work, which are exposed to likely sources of damage during the remainder of the construction period, including the probable areas of glass breakage.

C. Immediately before the time of final acceptance, the Contractor shall clean the doors thoroughly, inside and out. Demonstrate proper cleaning methods to the Owner's maintenance personnel during this final cleaning. Prepare a "Cleaning and Maintenance Manual" listing the types of cleaning compounds, cleaning methods, and the types of sealants and glazing materials to be used for cleaning, repair, and maintenance of the work.

1.07 WARRANTY:

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Warranty: Submit a written warranty executed by the manufacturer agreeing to repair or replace components of entrance and storefront systems that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:

1. Structural failures including, but not limited to, excessive deflection.

2. Adhesive sealant failures.

3. Failure of system to meet performance requirements.

4. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

5. Failure of operating components to function normally.

6. Water leakage through fixed glazing and frame areas.

Warranty Period: 2 years from date of Substantial Completion. In addition, welded door corner construction shall be supported with a limited lifetime warranty for the life of the door under normal use.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. As Basis-of-Design, details and specifications have been based on the following products by Kawneer Company, Inc. 555 Guthridge Court, Technology Park / Atlanta, Norcross, GA 30092 (tel) 770-449-5555; (fax) 770-734-1560:

1. Aluminum Doors: ***Kawneer Standard Entrance Series;***

   500 Wide Stile Door; 5" vertical face dimension, 1-3/4" depth, high traffic applications.

2. FRP Doors: ***Kawneer Flushline Series;***

3. Framing: ***Kawneer TriFab VG 451T*** framing system.

B. References to named manufacturers shall be construed only as establishing the quality of materials and workmanship to be used under this section, as shall not, in any way, be construed as limiting competition. Products used shall be those upon which the design is based, or shall be equal products approved in advance by the Architect. Requests for substitutions will be considered in accordance with provisions of the General Conditions. All permitted equals must be approved in writing by the Architect or Engineer-or-Record. All applications for substitution must include samples and technical data.

C. Substitution Documentation:

a. Product Literature and Drawings: Submit product literature and drawings modified to suit specific project requirements and job conditions.

b. Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for entrance system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum entrances for a period of not less than ten (10) years.

C. Test Reports: Submit test reports verifying compliance with each test requirement required by the project.

D. Product Sample and Finish: Submit product sample, with specified finish and color.

E. Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.

2.02 ALUMINUM ENTRANCE ASSEMBLIES:

A. General: Provide complete aluminum vestibule assemblies, including doors, frames, glass, and related accessories. Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings. Fabricate components for shear-block frame construction.

1. Forming: Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.

2. Prepare components to receive concealed fasteners and anchor and connection devices.

3. Fabricate components to drain water passing joints and condensation and moisture occurring or migrating within the system to the exterior.

4. Welding: Weld components to comply with referenced AWS standard. Weld before finishing components to greatest extent possible. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

5. Glazing Channels: Provide minimum clearances for thickness and type of glass indicated according to FGMA's "Glazing Manual."

6. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

7. Storefront: Fabricate framing in profiles indicated for flush glazing (without projecting stops). Provide subframes and reinforcing of types indicated or, if not indicated, as required for a complete system. Factory assemble components to greatest extent possible. Disassemble components only as necessary for shipment and installation.

8. Entrances: Fabricate door framing in profiles indicated. Reinforce as required to support imposed loads. Factory assemble door and frame units and factory install hardware to greatest extent possible. Reinforce door and frame units as required for installing hardware indicated. Cut, drill, and tap for factory-installed hardware before finishing components.

9. Exterior Doors: Provide compression weather stripping at fixed stops. At other locations, provide sliding weather stripping retained in adjustable strip mortised into door edge.

B. Framing:

1. Materials:

a. Framing members, transition members, mullions, adapters, and mountings: Extruded aluminum with alloy and temper as recommended by manufacturer to comply with strength and finish requirements, and temper recommended by manufacturer for type of use and finish indicated, complying with the requirements of standards indicated below.

1. Sheet and Plate: ASTM B 209.

2. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221.

3. Extruded Structural Pipe and Tubes: ASTM B 429.

4. Bars, Rods, and Wire: ASTM B 211.

5. Welding Rods and Bare Electrodes: AWS A5.10.

6. Steel Reinforcement: Complying with ASTM A 36 for structural shapes, plates, and bars; ASTM A 611 for cold-rolled sheet and strip; or ASTM A 570 for hot-rolled sheet and strip.

7. Glazing as specified in Division 8 Section *"Glazing".*

b. Screws, miscellaneous fastening devices, and internal components: Stainless steel or plated or corrosion resistant materials of sufficient strength to perform the functions for which they are used.

c. Spacers, Setting Blocks, Gaskets, and Bond Breakers: Manufacturer's standard permanent, non-migrating types in hardness recommended by manufacturer, compatible with sealants, and suitable for system performance

requirements. Glazing gaskets shall be either EPDM elastomeric extrusions or a thermoplastic elastomer. Thermal separators for door cladding shall be rigid polyvinylchloride (PVC) extrusions. Provide adjustable glass jacks to help center the glass in the door opening.

d. Structural Silicone Sealant: Type recommended by sealant and system manufacturers that complies with ASTM C 1184 requirements, is compatible with system components with which it comes in contact, and is specifically formulated and tested for use as a structural sealant. Color as selected by the Architect from manufacturer's full range of colors. Tensile Strength: 100 psi minimum. Provide sealant with modulus of elasticity that will not allow movement of more than 25% of joint width, unless less movement is required by structural-sealant-glazed systems' design. Use neutral-cure silicone sealant with insulating-glass units.

e. Secondary Sealant: For use as weatherseal, compatible with structural silicone sealant and other system components with which it comes in contact, and that accommodates a 50 percent increase or decrease in joint width at the time of application when measured according to ASTM C 719. Color as selected by the Architect from manufacturer's full range of colors. Use neutral-cure silicone sealant with insulating-glass units. Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint type.

f. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements, except containing no asbestos, formulated for 30-mil thickness per coat.

2. Entrance System Fabrication:

a. Full tubular sections, 2” x 4 ½” nominal dimension; front, center or back fabrication as show in Construction Document details with the following wall thicknesses:

1. Exposed faces and sides: 3/16" minimum.

2. Recessed sidewalls receiving mortised or concealed hardware: 1/4" minimum.

3. Flush glazing pockets: 1/8" minimum.

b. Machine bolt door opening framing components to other framing components and plug holes to match framing finish. Connect framing components functioning as glass holding assemblies with standard frame clips and screws.

c. Provide fully resilient glass settings with moldings and trim inserts not less than 1/16" thick.

d. Fasteners: Where exposed, shall be aluminum, stainless steel or plated steel.

e. Perimeter Anchors: Aluminum. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

3. Hardware: Refer to Section 08710 and Door Schedule.

Weatherstripping:

a. Meeting stiles on pairs of doors shall be equipped with an adjustable astragal utilizing wool pile with polymeric fin.

b. The door weathering on a single acting offset pivot or butt hung doors and frame (single or pairs) shall be Kawneer Sealair weathering. This is comprised of a thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing.

Sill Sweep Strips: EPDM blade gasket sweep strip in an aluminum extrusion applied to the interior exposed surface of the bottom rail with concealed fasteners. (Necessary to meet the specified performance testing)

Threshold: Extruded aluminum, one piece per door opening, with ribbed surface.

For balance of hardware, refer to Specification Section 08710.

4. Glazing: Provide 1” Insulated Glass for exterior applications and 1/4” Tempered Glass for interior applications unless otherwise noted - Refer to Section 08800 for glass types as indicated on drawings.

C. Aluminum Doors:

1. Materials:

a. Extrusions shall be 6063-T5 alloy and temper (ASTM B 221 alloy G.S. 10A-T5). Fasteners, where exposed, shall be aluminum, stainless steel, or plated steel in accordance with ASTM A 164. Perimeter anchors shall be aluminum or steel, providing the steel is properly isolated from the aluminum. Glazing gaskets shall be elastomeric extrusions. Major portions of the door stiles shall be .125" thick, and glazing molding shall be .050" thick.

2. Entrance System Fabrication:

a. The door stile and the rail face dimensions of the 500 Standard Entrance door will be as follows:

   1. Door: 500.
   2. Vertical stile: 5".
   3. Top rail: 7-1/2".
   4. Optional Cross Rail: 6”.
   5. Optional Bottom Rail: 10”.
   6. Final rail dimensions to be coordinated with construction documents.

b. Corner construction shall consist of mechanical clip fastening, SIGMA deep penetration plug welds and 1-1/8" long fillet welds inside and outside of all four corners. Glazing stops shall be hook-in type with EPDM glazing gaskets reinforced with non-stretchable cord.

c. Exposed portions of door cladding moldings shall be 3/32” thick.

c. The door weathering on a single acting offset pivot or butt hung door and frame (single or pairs) shall be *Kawneer Sealair* weathering. It is a thermoplastic elastomer weathering in a tubular shape with a semi-rigid polymeric backing. Optional: The door bottom rail will be weathered with an EPDM blade gasket weep strip applied with concealed fasteners.(Necessary for specified performance.)

d. The door weathering on a double acting, center pivoted door and frame (single or pairs) shall be pile cloth. Optional: The door bottom rail will be weathered with an EPDM blade gasket sweep strip applied with concealed fasteners. The meeting stiles on pairs of doors shall be equipped with an adjustable astragal.

e. PVC separators shall be applied to the interior side of door structure with screws spaced not more than 9-3/4" on centers. Aluminum cladding shall be interlocked with PVC separators at both edges and mechanically secured to door without adhesives. There shall be no metal to metal contact, direct or indirect, between the cladding or the cladding attachments and the door structure.

f. Brackets and Reinforcements: Provide manufacturer's standard brackets and reinforcements that are compatible with adjacent materials. Provide non-staining, nonferrous shims for aligning system components.

g. Accurately fit and secure joints and corners. Make joints hairline in appearance.

h. Prepare components with internal reinforcement for door hardware.

g. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Reinforce members as required to retain fastener threads. Arrange for fasteners and attachments to be concealed from view.

h. Do not use exposed fasteners, except for hardware application. For hardware application, use countersunk Phillips flat-head machine screws finished to match framing members or hardware being fastened, unless otherwise indicated.

i. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123 or ASTM A 153 requirements.

j. Concealed Flashing: Dead-soft, 0.018-inch thick stainless steel, complying with ASTM A 666, of type selected by manufacturer for compatibility with system.

k. Weatherstripping: Manufacturer's standard replaceable weather stripping as follows:

1. Compression Weather Stripping: Molded neoprene complying with ASTM D 2000 requirements or molded PVC complying with ASTM D 2287 requirements.

2. Sliding Weather Stripping: Wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing complying with AAMA 701 requirements.

3. Hardware: Refer to Section 08710 and Door Schedule. General: Provide heavy-duty hardware units indicated in sizes, number, and type recommended by manufacturer for entrances indicated for all hardware not depicted within hardware sets described within Section 08710. Finish exposed parts to match door finish, unless otherwise indicated.

4. Glazing: Provide 1” Insulated Glass for exterior applications and 1/4” Tempered Glass for interior applications unless otherwise noted - Refer to Section 08800 for glass types as indicated on drawings.

2.03 FIBERGLASS REINFORCED POLYESTER DOORS

A. Materials

1. Aluminum (Entrances and Components):

a. Material Standard: (ASTM B 221; 6063-T6 alloy and temper.

b. Door face sheets shall be embossed fiberglass reinforced polyester (F.R.P.) 0.120” thick.

1. Door facing to be metal having a minimum thickness of 0.032 inch aluminum or steel having a base metal thickness of not less than 0.016 inch at any point; or must have been tested to perform equivalent to this construction. Provide tests reports certified with an ICC-Evaluation Service Test Report.

c. Interior door face sheets shall have ‘Class A’ finish.

1. Class A flame spread and smoke developed rating on interior faces of exterior panels and both faces of interior panels.
2. Flame Spread, ASTM E 84: Maximum of 25.
3. Smoke Developed, ASTM E 84: Maximum of 450.

d. Core of flush doors shall be froth-in-place urethane foam at 5.0 lb./cu. ft. density shall have “0” O.D.P. = “Zero” Ozone Depletion Potential and contains no CFC’s (Chloroflurocarbons) or HCHC’s (Hydro Chlorofluorcarbons)

e. Glass for vision lites to be insulated – See Glass & Glazing Section 08800.

f. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of entrance members are nominal and in compliance with Aluminum Standards and Data, published by the Aluminum Association.

2. Glazing gaskets shall be either EPDM elastomeric extrusions or a thermoplastic elastomer.

B. Accessories

1. Fasteners: Where exposed, shall be Stainless steel.

2. Perimeter Anchors: Aluminum, when steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

C. Hardware

1. Weatherstripping:

a. Meeting stiles on pairs of doors shall be equipped with an adjustable astragal utilizing wool pile with polymeric fin.

b. The door weathering on a single acting offset pivot or

butt hung door and frame (single or pairs) shall be Kawneer Sealair® weathering. This is comprised of a thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing.

2. Sill Sweep Strips: EPDM blade gasket sweep strip in an aluminum extrusion applied to the interior exposed surface of the bottom rail with concealed fasteners (Necessary to meet specified performance tests).

3. Refer to Specification Section 08710

D. FRP Entrance System Fabrication:

1. Top and bottom rails shall be joined to tubular door stiles by mechanical clip fastening and SIGMA deep penetration plug welds and 1-1/8" (29) long fillet welds inside and outside of all four corners. Face sheets shall lap and interlock stiles and rails to create a hollow cavity for the froth-in-place urethane core.

2. Vertical door sections shall be 1-3/4" (45) overall depth with integral reglets to receive and conceal edges of face sheets on both sides of door.

3. Doors shall be reinforced internally to receive surface applied and mortised hardware.

2.04 ALUMINUM FINISHES:

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

B. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.

1. Apply the specified finish to visible aluminum surfaces of all aluminum entrance assemblies. Apply a compatible and durable matching finish to visible fasteners or hardware.

2. Prepare the surfaces for finishing in accordance with recommendations of the aluminum producer and the finisher or processor for the specified finish.

3. Three coat process finish on doors and immediate or adjacent frames. Class I, Color Kynar Finish: Architectural Class I,

integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA2605. Color as selected by Architect from the full range of industry colors and color densities.

a. Primer coat: Kynar.

b. Kynar finish color coat:

1. Provide Fluoropolymer finish (Kynar 500) based laminated coating similar to "Duranar" (70% PVDF) by PPG Industries.

2. Color as indicated on the drawings or as selected and approved by Architect.

c. Clear coat: One (1) coat clear Kynar protective finish over all painted doors and frames.

2. Contractor to provide and utilize "Air Dry" paint provided by Kawneer to touch up all doors, frames, and ancillary hardware by spray on method.

2.05 SOURCE QUALITY CONTROL

A. Source Quality: Provide aluminum entrances specified herein from a single source of supply.

1. Building Enclosure System: When aluminum entrances are a part of a building enclosure system, including entrances, framing, windows, curtain wall system and related products. Provide building enclosure system products from a single source manufacturer.

B. Fabrication Tolerances: fabricate aluminum entrances in accordance with entrance manufacturer’s prescribed tolerances.

2.06 STEEL PRIMING:

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying primer.

B. Surface Preparation: Perform manufacturer's standard cleaning operations to remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel.

C. Priming: Apply manufacturer's standard corrosion-resistant primer immediately after surface preparation and pretreatment.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of entrance and storefront systems. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions. Verify openings are sized to receive entrance system and sill is level in accordance with manufacturer's acceptable tolerances.

C. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

3.02 INSTALLATION:

A. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

B. Comply with the manufacturer's written specifications and recommendations for protecting, handling, assembly and installation of entrance assemblies and other components of the work. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight.

C. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

D. General: Install entrance system in accordance with manufacturer's instructions and AAMA storefront and entrance guide specifications manual.

E. Set units plumb, level, and true to line, in alignment with established lines and grades, without warp or rack of frames, sash, doors, or panels. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities. Provide alignment attachments and shims to permanently fasten system to the building structure. Anchor securely in place. Separate aluminum and other corrodible metal

surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

f. Make suitable provision for thermal expansion in assembly of groups of units. Install components to drain water passing joints and condensation and moisture occurring or migrating within the system to the exterior.

G. Set sill member, thresholds, and other members in a full bed of sealant compound as shown or with joint fillers or gaskets as shown to provide weathertight construction, and secure. Comply with requirements of Division 7 Section "Joint Sealants."

H. Provide suitable gaskets or coatings where dissimilar metals are in contact. Lubricate operating hardware and other moving parts according to hardware manufacturers' written instructions.

I. Install surface-mounted hardware according to manufacturer's written instructions using concealed fasteners to greatest extent possible. Adjust doors and hardware to provide a tight fit at contact points and at weatherstripping (if any) for smooth operation and weathertight closure.

J. Clean aluminum surfaces promptly after installation of units. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and other moving parts.

K. Where protective coating has been damaged, remove coating completely as soon as the completion of construction activities no longer requires its retention.

L. Install glazing to comply with requirements of Division 8 Section "Glazing," unless otherwise indicated.

M. Prepare surfaces that will contact structural sealant according to sealant manufacturer’s written instructions to ensure compatibility and adhesion.

N. Preparation includes, but is not limited to, cleaning and priming surfaces.

O. Install structural silicone sealant according to sealant manufacturer's written instructions.

P. Mechanically fasten glazing in place until structural sealant is cured. Remove excess sealant from component surfaces before sealant has cured.

Q. Install secondary-sealant weatherseal according to sealant manufacturer's written instructions to provide weatherproof joints. Install joint fillers behind sealant as recommended by sealant manufacturer.

R. Erection Tolerances: Install entrance and storefront systems to

comply with the following maximum tolerances:

1. Variation from Plane: Limit variation from plane or location shown to 1/8 inch in 12 feet; 1/4 inch over total length.

2. Alignment: Where surfaces abut in line, limit offset from true alignment to 1/16 inch. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch.

3. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch.

3.03 FIELD QUALITY CONTROL:

A. Water Spray Test: After completing the installation of test areas indicated, test storefront system for water penetration according to AAMA 501.2 requirements.

B. Repair or remove and replace Work that does not meet requirements or that is damaged by testing; replace to conform to specified requirements.

3.04 ADJUSTING AND CLEANING:

A. Adjust doors and hardware to provide tight fit at contact points and weather stripping, smooth operation, and weathertight closure.
Remove excess sealant and glazing compounds, and dirt from surfaces.

3.05 CLEANING AND PROTECTION:

A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with the manufacturer's instructions prior to Owner's acceptance. Remove construction debris from the project site and legally dispose of all debris.

B. Protection: Provide final protection and maintain conditions, in a manner acceptable to the manufacturer and installer, that ensure entrance and storefront systems are without damage or deterioration at the time of Substantial Completion. Protect installed product's finish surfaces from damage during construction. Protect aluminum entrances from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants. Remove and replace damaged aluminum entrances at no extra cost.

END OF SECTION

DIVISION 8 – DOORS & WINDOWS

SECTION 08411 – ALUMINUM SECURITY FRAMED ENTRANCES AND STORE FRONTS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Aluminum bullet and blast resistant interior and exterior frames included but not limited to transoms and sidelights, and security doors.

1.02 RELATED DOCUMENTS

A. Drawings, and general provisions of the Contract.

1.03 RELATED SECTIONS

A. Section 087100 – Door Hardware

B. Section 08800 – Glass and Glazing

C. Section 01300 – Submittal Procedures

1.04 PERFORMANCE REQUIRMENTS

A. Ballistics-Resistance Performance Requirements: Provide security window frames and door assemblies identical to those tested for compliance with requirements indicated, and as follows.

1. Security door assemblies, window and window assemblies will meet or exceed the requirements of UL 752 Level III.

2. Testing is conducted by H.P. White Laboratory, or an approved equivalent independent testing laboratory.

3. Proof of certification is available upon request.

4. Testing conforms to Underwriters Laboratory UL 752 Ballistic Standards.

B. Blast Resistant Performance and Design Requirements: Provide security door and window assemblies and the anchorage analysis that comply with requirements indicated and as follows.

1. Security door assemblies will be calculated to meet:

2. Security door assemblies will comply with design build blast drawings and calculations.

3. A detailed engineered blast calculations by a qualified blast engineer to substantiate that the system design and anchorage meets or exceeds the minimum performance required.

1.05 SUBMITTALS

A. Design Calculations: Submit design analysis and calculations verifying conformance to specified blast criteria.

B. Shop Drawings: Provide elevations indicating rough openings requirements and details for field installed assemblies.

C. Qualification Data: Submit qualifications verifying years of experience; include list of completed jobs having similar scope of work, identified by name, location, date contact names and phone numbers.

D. Product Data: Provide manufacture's data sheets on all products used.

E. Selection Samples: Provide two product samples for each finish specified.

F. Verification Samples: Provide sample for product specified, minimum size 6 inches (150 mm) square, and representing actual product.

1.06 QUALITY ASSURANCE

A. Provide test reports from a nationally recognized testing laboratory certifying the UL rating on product.

B. Drawings and specifications are based on Action Bullet Resistant's Model BR 250 Door and Model BR 250 Curtain Wall.

C. Installer Qualifications: An experienced installer who has completed similar design, material and extent to this project.

D. Manufacture's facility will be made available during production for inspection of doors and windows by customer's representative to ensure compliance of products with drawings and specifications.

1.07 DELIVERY, STORAGE AND HANDLING

A. Product will be securely crated to prevent damage during shipping. Each crate will be identified by door number and/or elevation. Packing list will identify all contents of crate.

B. Frames are supplied fully assembled or K-D depending on size.

C. Verify contents of crate within five days of receipt. If crates are to be stored for log periods due to construction delays, place in a dry warehouse with moderate temperatures.

D. When handling crates use forklift or pallet jack.

1.08 PROJECT CONDITIONS

A. Field Measurements: Verify security window and door openings by field measurements before fabrication and indicate measurements on Shop Drawings.

B. Established Dimensions: Where field measurements cannot be made without delaying the work, establish openings and proceed with fabrication without field measurements using held dimensions. Coordinate wall construction to ensure that actual openings dimensions correspond with held dimensions.

1.09 WARRANTY

A. Contractor warrants installation for a period of one year and assumes full responsibility for installation of the system, which includes the window, window system, doors, glass, anchorage, setting, sealing, flashing, etc., as it relates to air, water and structural adequacy as required in the shop drawings and specifications.

B. Manufacture warrants products for period of one year from the date of customer receipt.

PART 2 – PRODUCTS

2.01 MANUFACTURE

A. Acceptable Manufacturer: Action Bullet Resistant, Inc., located at 263 Union Blvd. West Islip, NY 11795: Toll Free Tel. 800-962-8088; Tel 631-422-0888; Fax Tel 631-422-4498; Email info@actionbullet.com: Web www.actionbullet.com , or Approved Equal.

2.02 PRODUCT TYPE

A. Security door available in full vision, half panel or full panel. Single swing or pair of doors with astragal, fixed or removable mullion.

B. Security windows available in fixed window or window system, i.e. curtain wall, sidelights and transom.

2.03 MATERIAL

A. Aluminum Extrusions: Aluminum alloy and temper – 6005-T5. Ultimate tensile strength of 37.7 ksi, and shear strength of 29.7 ksi.

B. Steel Blast Reinforcement: (Steel straps and anchors)

1. Steel plates, shapes and bars ASTM A-36
2. Seamless steel structural tubing ASTM A-500.

C. Silicone: Structural silicone GE SCS 1000 complies with ASTM-C-920-05.

D. Glass and Glazing: See Section 08800.

E. Setting blocks – Neoprene 80-85 durometer ASTM-D-2000

F. Hardware: For custom hardware, contact Action Bullet Resistant's sales representative for hardware compatibility. Standard door hardware:

1. Select SL21HD full surface hinge.
2. Adams Rite 1850 lock with standard keyed cylinder and thumb turn.
3. Class 1 surface mounted closer.
4. Rockwood 1" diameter 10" center offset wire push/pull set.
5. Threshold ½" x 4" aluminum mill finish.

2.04 FABRICATION

A. Door is a heavy-duty aluminum medium style. Door thickness 2 ¼" with a 3/8" minimum wall thickness, vertical door stile 4" wide, door frame profile 2 ½" x 4 ½" with a 3/16" minimum wall thickness. Glazing pocket to be 1" deep for proper bite.

B. Horizontal top door rail to be nominal 4", additional rails can be added upon request.Horizontal bottom rail is 5 ½" wide with a removable stop for glazing in the field, additional rails can be added upon request.

D. Doors to have tight hairline joints where rails are fitted against stiles.

E. Doorstops snap in as an integral part of doorframe.

F. Door accommodates a maximum glass thickness of 1 3/8".

G. Doors and frames are fully fabricated and shipped to customer for field installation.

H. Fasteners where exposed will be stainless or other non-corrosive material.

I. Doors are glazed from the inside by utilizing the removable stop and wet sealed.

J. Window and window systems frames are 2 ½" x 4 ½" with 3/16" minimum wall thickness on vertical mullion and 3/32" minimum wall thickness on horizontal mullion.

K. Window and window system to have a screw spline system with tight hairline joints where the horizontal mullion meets with vertical mullions.

L. Window and window systems are glazed from the outside.

M. Glazing pocket to be 1" deep for proper bite.

2.05 FINISH

A. Exposed surfaces to be free of scratches and other serious blemishes. Anodic finishes are electrolytically deposited class II finish. Manufactures standard finish:

1. Clear Anodize – ASTM-B-137-95
AAMA 608.1

2. Dark Bronze Anodize - ASTM-B-137-95
AAMA 608.1

B. Painted Finishes:

1. 70% Kynar-Base AA-M10- AAMA 2605
Duranar or Fluropon C41-RX ASCA 96
2. Tiger Drylac RAL# (T.B.D.)

PART 3 – EXECUTION

3.01 EXAMINATION

A. With Installer examine substrates, areas, and conditions for compliance with the requirements for installation tolerances and other conditions affecting functionality and performance of security entrances window systems.

1. Examine rough-in opening for built-in and embedded anchors to verify actual locations of connections before installation.

2. Prepare a written report, endorsed by the installer, listing conditions detrimental to the functionality and performance of security doors and window systems.

3. Examine and inspect built-in and cast-in anchors installations to verify that they comply with requirements. Prepare inspection reports. If removal and replacement is required by inspection, re-inspect after repairs are made and document in inspection report.

4. Clean surfaces thoroughly prior to installation.

3.02 INSTALLATION

A. Door assemblies and window systems shall be installed in their correct locations, set level, square and plumb in alignment with other work and substrates, in accordance with manufactures instructions, approved shop drawings and accepted industry standards. All joints between door framing and window systems and rough opening shall be sealed using sealant to ensure a weather tight installation.

B. Install shall take special care to ensure that impact side of glass faces the threat axis.

3.03 FIELD QUALITY CONTROL

A. Inspect installed items to ensure compliance with requirements.

B. Protect installed items until completion of project.

END OF SECTION

DIVISION 8 - DOORS AND WINDOWS

SECTION 08520 - ALUMINUM WINDOWS (INSULATED GLASS)

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Work included: Furnish labor, materials, tools, and equipment necessary or required to perform and complete the installation of aluminum windows as indicated on the drawings and specified herein. Window shapes and accessories as specified and detailed shall establish the type of units and materials to be used to provide the functional performance and aesthetic requirements desired. Details indicate the required depth and profile. Work shall include, but not necessarily be limited to, the following:

1. Preparation of all rough openings as required to permit proper installation of new aluminum windows and panel systems as shown on drawings and described in the specifications. Note: Remove all sash intact and complete.

2. Removal of existing sash or other existing materials or portions thereof which are required to be removed or altered to permit proper installation of new aluminum windows and panel systems as shown on drawings and described in the specifications.

3. Furnish and install new factory glazed, thermally broken aluminum windows and panels as specified herein, together with all necessary mullion covers, mullions, receptors, filler plates, panning, trim, sheet or plate extrusions for trim, muntins, operating hardware, screens and all other accessories specified herein and/or shown or noted on the drawings, or as required, including anchors, clips, shims, fasteners, drilling, taping and all other activities necessary for the proper installation of the work of this section.

4. Provide .063 extruded aluminum exterior window sills (finish to match window frame specified herein) for all new aluminum windows, except as noted otherwise on the drawings.

5. All window hardware including balances, locks, keepers, poles, hangers, etc.

6. Insulated metal panels and frames as required, or where indicated on drawings.

7. Insulation against contact of aluminum surfaces with dissimilar metals.

8. Finish on all exposed aluminum surfaces.

9. Installation of new windows, panels, etc. including anchors,

clips, shims, blocking, fasteners, drilling, tapping, and all other things necessary for the proper installation of work under this section.

10. Glass and glazing. (Provide insulated glass or insulated panel at all assemblies as indicated on drawings.)

11. Installation of treated wood blocking, fillers and nailers as required for complete and secure installations.

12. Caulking and sealing of all metal to metal and metal to masonry.

13. Adjustment and servicing of window sash and hardware and replacement of broken or defective parts.

14. Cleaning of aluminum and glazing surfaces.

15. Maintenance, operation and protection.

16. Extra materials as specified or required.

17. Adjustment and servicing of window sash and hardware and replacement of broken or defective parts.

18. Verification of all openings and conditions.

19. Supply and loading of all required containers for storage of all materials and debris, and the legal disposal of all such materials.

B. Related Work Described Elsewhere:

1. Rough Carpentry: Section 06100
2. Finish Carpentry: Section 06200
3. Joint Sealers: Section 07900
4. Glass and Glazing: Section 08800
5. Roller Shades/Blinds: Section 12530

C. Related Documents: Drawings and General Provisions of Contract, including, General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.02 QUALITY ASSURANCE:

A. Standards: Comply with the provisions of the standards listed below and the applicable standards listed in Section 01085 (including all revisions of contract to date):

1. Performance class designations according to American Architectural Manufacturers Association (AAMA)Window & Door Manufactures Association(WDMA)and the Canadian Standards Association(CSA) AAMA/WDMA/CSA 101/I.S.2/A440-08.

a. AW: Architectural

2. Performance grade number according to AAMA/WDMA/CSA 101/I.S.2/A440-08.

    a. Design pressure number in pounds force per square foot (pascals) used to determine the structural test pressure and water test pressure.

3. American Society for Testing and Materials (ASTM):

    a. E283: Test for rate of air leakage through exterior windows, curtain walls, and doors.

    b. E330: Test for structural performance of exterior windows, curtain walls, and doors by Uniform State Air Pressure Difference.

    c. E331: Test for water penetration of exterior windows, curtain walls, and doors by Uniform Static Air Pressure Difference.

    d. E547: Test for water penetration of exterior windows, curtain walls, and doors by Cyclic Static Air Pressure Differential.

    e. E1996: Glazed opening protection for wind-borne debris shall meet the requirements of the Large Missile Test of ASTM E1996 and ASTM E 1886. Provide glazed windows capable of resisting the large missile impact from windborne debris, based upon pass/fail criteria as determined by testing glazed windows identical to those sizes specified. (Note: This is required ONLY for new construction projects whose locations (as indicated) fall within one mile of the coastal mean high water line - any water area experiencing tidal change.)

4. Provide Test Reports from an AAMA approved test laboratory certifying the performance as specified herein. Test reports shall be no more than 4 years old. Test reports based on downsized test units will not be accepted.

5. Test reports shall be accompanied by an AAMA Notice of Product Certification stating that the tested window meets or exceeds the referenced criteria for the AAMA/WDMA/CSA 101/I.S.2/A440-08.

6. Wind Loads: Provide windows, including anchorage, capable of withstanding wind-load design pressures calculated according to requirements of the 2015 International Building Code or the American Society of Civil Engineers' ASCE 7, "Minimum Design Loads for Buildings and Other Structures," 6.4.2, "Analytical Procedure," whichever are more stringent. Refer to drawings for Wind Design Data.

7. Flat Glass Marketing Association (FGMA): “Glazing Manual”.

9. Glazing Publications: Comply with published recommendations of

glass manufacturers and with GANA's "Glazing Manual" unless more stringent requirements are indicated.

B. Qualifications of Manufacturer: Provide aluminum windows produced by a single manufacturer regularly engaged in the manufacture of units similar to those required and with a history of successful production acceptable to the Architect.

C. Qualifications of Installers: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements of the manufacturer's recommended methods of installation needed for proper performance of the work of this section.

D. Manufacturer's Certification: Prior to start of installation of the work of this section, secure visits to the job site by a representative of the manufacturer who shall inspect and certify that:

1. The openings in which the work of this section will be installed are all in condition suitable for installation.

2. The materials to be installed comply in all respects with the requirements of this section of these specifications.

3. The materials will be installed in complete accordance with the manufacturer's specifications.

1.03 SYSTEM DESCRIPTION:

A. Design Requirements: Aluminum window assemblies include the following components which may be specified in other sections:

1. Horizontal sliding windows. (Test size 99” x 79”)

2. Single/Double hung windows. (Test size 60” x 99”)

2. Projected sash windows. (Test size 60” x 144”)

3. Fixed sash windows. (Test size 60” x 99”)

4. Fixed insulating panels.

5. Glass and glazing of aluminum windows; refer to Item 2.02E herein and Specification Section 08800.

6. Caulking between aluminum windows and other materials (interior and exterior).

B. Performance Requirements:

1. Meet or exceed performance characteristics for specified window classification as described in AAMA/WDMA/CSA 101/I.S.2/A440-08 unless otherwise specified.

a. Window Classifications: Minimum Frame Depth: 3-3/4 inches.

1. Horizontal Sliding Windows: AAMA AW-PG70
2. Fixed windows: AAMA AW-PG150
3. Projected windows: AAMA AW-PG70
4. Casement windows: AAMA AW-PG150
5. Double hung windows: AAMA AW-PG110
6. Single hung windows: AAMA AW-PG105

b. Air Infiltration (AAMA/WDMA/CSA 101/I.S.2/A440-08) with sash closed and locked:

1. Horizontal Sliding, Dual Operating Insulated Glazed Windows: Not more than 0.30 cfm per foot of perimeter crack length area at an inward test pressure of 6.24 psf (With both the primary and secondary sash in the closed and locked position).

   a. Air infiltration on windows shall not exceed .30 cfm per square foot of frame when tested at static air pressure difference 6.24 psf (equivalent to 50 mph wind velocity - After Life cycling).

2. Fixed Insulated Glazed Windows: Not more than 0.30 cfm per square foot of fenestration when tested at static air pressure difference of 6.24 psf.

3. Projected Insulated Glazed Windows: Not more than .30 cfm per square foot of fenestration when tested at static air pressure difference of 6.24 psf.

4. Casement Insulated Glazed Windows: Not more than .30 cfm per square foot of fenestration when tested at static air pressure difference of 6.24 psf.

5. Double Hung Insulated Glazed Windows: Not more than 0.30 cfm square foot of fenestration when tested at static air pressure difference of 6.24 psf.

6. Single Hung Insulated Glazed Windows: Not more than 0.3 cfm per square foot of fenestration when tested at static air pressure difference of 6.24 psf.

c. Water Resistance (ASTM E331): No controlled water leakage with sash closed and locked and tested at:

1. Horizontal Sliding, Dual-Operating Insulated Glazed Windows: Static air pressure difference of 15.00 psf.

2. Fixed Insulated Glazed Windows: Static air pressure difference of 15.00 psf positive and negative.

3. Projected Insulated Glazed Windows: Static air pressure difference of 15.00 psf.

4. Casement Insulated Glazed Windows: Static air pressure difference of 15.00 psf.

5. Double Hung Insulated Glazed Windows: Static air pressure difference of 15.00 psf.

6. Single Hung Glazed Windows: Static air pressure difference of 15.00 psf.

d. Uniform Load Structural Test (ASTM E330). No glass breakage, permanent damage to fasteners, hardware parts, support arms, or actuating mechanisms, nor damage rendering window inoperable when tested with sash closed and locked at:

1. Horizontal Sliding, Dual-Operating Insulated Glazed Windows: Static air pressure difference of 105 psf positive and negative.

2. Fixed Insulated Glazed Windows: Static air pressure difference of 150 psf positive and negative.

3. Projected Insulated Glazed Windows: Static air pressure difference of 105 psf positive and negative.

4. Casement Insulated Glazed Windows: Static air pressure difference of 135 psf positive and negative.

5. Double Hung Insulated Glazed Windows: Static air pressure difference of 150 psf positive and negative.

e. Condensation Resistance Factor (AAMA 1503) with sash and ventilators closed and locked:

1. Horizontal Sliding, Dual-Operating Insulated Glazed Windows: Not less than 50 CRF.

2. Fixed Insulated Glazed Windows: Not less than 52 CRF.

3. Projected Insulated Glazed Windows: Not less than 50 CRF.

4. Casement Insulated Glazed Windows: Not less than 50 CRF.

5. Double Hung Insulated Glazed Windows: Not less than 50 CRF.

5. Single Hung Insulated Glazed Windows: Not less than 51 CRF.

f. Solar heat Gain Coefficient (SHGC) for window fenestration:
1. Where PF<0.2: SHGC = 0.36 min.
2. Where 0.2≤PF<0.5: SHGC = 0.43 min.
3. Where PF≥0.5: SHGC = 0.58 min.

g. Thermal Transmittance / Performance ("U" Value) (AAMA 1503.1) with sash closed and locked:

1. Horizontally Sliding Dual-Operating Insulated Glazed Windows: Conductive thermal transmittance (U-value) not more than 0.45/BTU/hr/s.f./deg.F.

2. Fixed Insulated Glazed Windows: Conductive thermal transmittance (U-value) not more than 0.38 BTU/hr/s.f./deg.F.

3. Projected Insulated Glazed Windows: Conductive thermal transmittance (U-value) not more than 0.45/BTU/hr/sf/deg.F.

4. Casement Insulated Glazed Windows: Conductive thermal transmittance (U-value) not more than 0.45/BTU/hr/sf/deg.F.

5. Double Hung Insulated Glazed Windows: Conductive thermal transmittance (U-value) not more than 0.45 BTU/hr/s.f./deg.F.

5. Single Hung Insulated Glazed Windows: Conductive thermal transmittance (U-value) not more than 0.45 BTU/hr/s.f./deg.F.

Note: The thermal resistance ("U") factor for all insulated glazed window units shall meet or exceed the U values for window units as mandated by the latest version of International Energy Conservation Code adopted by New York State.

2. All test reports shall be furnished showing compliance to the above performance specifications. Test reports shall not be older than 4 years.

1.04 PROJECT CONDITIONS:

A. Field Measurements: Check actual window openings in construction work by accurate field measurement before fabrication of custom window units. Show recorded measurements on final shop drawings.

1. Established Dimensions: Where field measurements cannot be made without delaying the work, establish opening dimensions and proceed with fabricating aluminum windows without field measurements. General Contractor shall coordinate wall construction to ensure that actual opening dimensions correspond to established dimensions.

2. Coordinate fabrication with construction progress to avoid delay.

1.05 SUBMISSIONS:

A. General: Before proceeding with the manufacture of windows, the Contractor shall submit complete shop drawings with installation

details for the Architect's review and approval. These drawings shall also show window elevations, details of window sections, collateral materials, details of anchorage and associated hardware. Submissions shall be in accordance with Section 01300 - Submissions, and as modified below.

B. Product Data:

1. Submit manufacturer's product data, specifications, standard details, and installation recommendations for components of aluminum windows required for the project.

2. Maintenance Manual: Submit three copies of bound maintenance manual for aluminum windows, including manufacturer's product literature on all components and manufacturer's instructions for cleaning, repair, and general maintenance of all components.

C. Shop Drawings: Submit shop drawings for the assembly and erection of the entire window system. Coordinate the submittal of shop drawings for component parts (as specified in other sections) with this transmittal. Show anchorages and alignments not shown on shop drawings of the components. Clearly indicate on all shop drawings all deviations from the Architect's drawings. Include structural calculations required to show compliance with wind pressure loading requirements, deflection requirements, and movements in the work.

D. Samples:

1. Submit three (3) samples of each required aluminum finish on 12-inch long extrusions or 6-inch square sheets. Where normal color and texture variations are to be expected, include two (2) or more units in each sample to shown the range of such variations. Samples will be reviewed by Architect for color and texture only. Compliance with other requirements is the exclusive responsibility of the Contractor.
2. Submit three (3) insulated panel samples comprised and labeled of the specified components and thickness.

3. Submit three (3) insulated glass samples comprised and labeled of the specified components and thickness.

4. Additional samples, if and as directed by the Architect, to show fabrication techniques, workmanship of component parts and design hardware, and other exposed auxiliary items.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING:

A. Windows and accessories shall be handled in compliance with AAMA Curtain Wall Manual No. 10, *"Care and Handling of Architectural Aluminum from Shop to Site."*

B. The Contractor shall be responsible for protecting the windows and their finish from damage by the elements, construction activities, and other hazards before, during, and after installation.

1.07 GUARANTEE:

A. Submit three (3) copies of written guarantee, signed by the Contractor and Manufacturer, agreeing to replace window work which fails in manufacturing, materials or workmanship within ten (10) years of the date of acceptance. Failure of materials or workmanship shall include, but not be limited to: excessive air infiltration, excessive deflections, delamination of panels, deterioration of finish or metal in excess of normal weathering, and defects in accessories, weatherstripping, and other components of the work. If a defect is found and brought to the attention of the manufacturer, the defect will be corrected at no cost to the Owner. A copy of the manufacturer's warranty shall be provided as a submittal document. Warranty shall not be pro-rated, and the manufacturer shall certify further that replacement parts shall be available for the life of the warranty.

B. Pigmented Organic Coating Warranty: The successful bidder shall certify in writing that the pigmented organic coating on all windows and systems furnished meet the requirements of AAMA 2605 specification for Kynar-based pigmented organic coating and the coating is fully warranted against chipping, peeling, cracking, or blistering for a period of twenty (20) years and five (5) years for AAMA 2603 from date of installation.

C. Insulated Glass shall be guaranteed against failure for a period of 10 Years from the date of installation.

D. Insulated metal panel shall be warranted by the panel manufacturer for a period of twenty-five (25) years. Panel Finish (Kynar resin-based) shall be guaranteed for a period of twenty (20) years.

PART 2 - PRODUCTS

2.01 GENERAL:

A. Design is based on use of aluminum window products as manufactured by Architectural Window Manufacturing Corp. 359 Veterans Boulevard, Rutherford, New Jersey, 07070, and the terminology used may include reference to that manufacturer's specific products. Such references shall be construed only as establishing the performance rating, quality of materials and workmanship to be used under this Section and shall not, in any way, be construed as limiting competition. *Bidder's Note: Proprietary assemblies or system components which are the exclusive product or patent of one particular company will not exclude a bidder from proposing alternate products, assemblies or system components, provided that all required parameters and submissions required of this specification are met and/or exceeded. Operation of units shall not be altered from that as described. Determination of equality shall be the sole decision of the Architect, whose determination shall be deemed final.* Manufacturer will have been engaged in aluminum window manufacturing for a minimum of fifteen (15) years.

Similar manufacturers include, but are not limited to:

1. **Traco Window Corp., a division of the Kawneer Company, Inc. 71 Progress Avenue, Cranberry Township, PA, 16066, ph. (800) 837-7002.**

B. Products used shall be those upon which design is based or shall be equal products approved in advance by the Architect.

C. Window Types:

1. Horizontal Slider Thermally Broken Window: Architectural Window Corp Series 6500i Horizontal Slider Window; TRACO/Kawneer 8470TL ISOLOCK (Thermally Broken)

2. Fixed Thermally Broken Window: Architectural Window Corp Series 7090i Fixed Window. TRACO/Kawneer 8410TL Fixed Impact Thermal Aluminum Window

3. Projected Thermally Broken Window: Architectural Window Corp Series 2542i Projected/Casement Window; TRACO/Kawneer INX3500 Projected Thermally Broken Project-Out Aluminum Window

4. Double Hung Thermally Broken Window: Architectural Window Corp Series 4000i Double Hung; TRACO/Kawneer Series TR-I9100 Double Hung Side Load Window

5. Single Hung Thermally Broken Window: Architectural Window Corp Series 4400i Double Hung; TRACO/Kawneer Series TR-9700 Single Hung Side Load Window

D. All windows within this project are to be built and supplied by a single manufacturer.

E. Products used shall be those upon which design is based or shall be equal products approved in advance by the Architect. Subject to compliance with all material, construction and performance requirements outlined in these specifications. Proof of equivalency is the responsibility of the contractor.

F. Substitutions: Requests for substitutions must demonstrate that the product seeking approval meets or exceeds the design and performance specifications of the named products.

2.02 MATERIALS: All window components shall be AAMA certified materials.

A. Aluminum Extrusions:

1. All frame and sash sections shall be accurately extruded aluminum shapes produced from commercial alloy 6063-T6 and shall be free from defects impairing strength and/or durability.

2. Thermal break: Provide window units with an integrally concealed low conductance structural and mechanical thermal barrier,

located between exterior materials and window members exposed on the exterior in a manner that eliminates direct metal to metal contact. The thermal barrier shall be INSULBAR or equal, and consist of two glass reinforced polyamide nylon 6/6 struts mechanically crimped in raceways extruded in the exterior and interior extrusions.

3. Frame, sash, mullion, and sill members shall be of such design and structural strength to satisfy the intended purpose and to meet the applicable AAMA performance requirements. Sill frame shall be constructed of tubular shapes formed from single and continuous extrusions and shall include an aluminum closed weep system to prevent accumulation of water in sill.

4. Gaskets: All corner joints of the master frame shall have neoprene compression gaskets to ensure a weather-tight seal.

5. No extruded plastics shall be allowed in the frame or sash members.

6. Exterior and interior frame sill shall have a minimum slope of five (5) degrees.

7. Muntins: Unless otherwise indicated, all muntins for all operational and fixed window units shall be 3/8" deep extruded profile aluminum, frame-mounted and applied to the unit exterior. Muntin colors shall be homogeneous. *Pressure-applied muntins shall not be permitted.*

B. Fasteners:

1. All screws, nuts, washers, bolts, rivets, and other fastening devices incorporated in the product shall be of sufficient strength and quality to perform their designated function.

2. Fasteners shall be made from aluminum, non-magnetic stainless steel, or other materials warranted by the manufacturer to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components of window units.

3. Locate all fasteners so as not to disturb the thermal break construction of windows.

C. Hardware:

1. Hardware shall be of aluminum, stainless steel, or other corrosion resistant materials compatible with aluminum.

2. Provide one (1) aluminum window operating pole for <u>each room</u> where new double-hung and/or project-in windows are installed.

3. Operating sash to have anti-take out (dormitory type) hardware for sash removal by authorized personnel only.

D. Weather Strip:

1. All sash shall be double weatherstripped using silicone-treated pile with a polypropylene center fin conforming to AAMA 701.2. Provide compressible weather stripping designed for permanently resilient sealing between adjoining window frames and/or perimeter sub-frame conditions. Weather stripping will be completely sealed when aluminum window is closed and installation is complete.

2. Provide woven-pile weather stripping of wool, polypropylene, or nylon pile and resin-impregnated backing fabric. Comply with AAMA 702/702. All weather-strips and weather seal shall be held in extruded ports and secured to prevent loss when operating sash.

3. Double hung and horizontal sliders shall be secured in double rows of extruded ports on sash perimeters. Rigid PVC in one side of vertical stiles and piles, conforming to AAMA 701/702-04, with polypropylene center fin in remaining locations. Projected, secured in extruded ports, double rows of EPDM gasket on vent perimeters.

E. Glass and Glazing:

1. All lites to be an "insulated glass" system, factory-glazed consisting of:

a. **Standard Glazing**:
Outboard Pane = 1/4" tinted tempered glass and 1/2" desicant-filled aluminum spacer, with Argon filled void. Inboard Pane = 1/4" tinted tempered glazing with PPG Solarban 70 Coating on #2 surface, unless otherwise noted within the documents. (Provide obscure glazing at inboard pane at all toilet rooms, locker rooms and where indicated on drawings) Total Thickness: 1"

Or

~~b. **Impact Glazing:** Glazed opening protection for wind-borne debris shall meet the requirements of the Large Missile Test of ASTM E1996 and ASTM E 1886. (Note: This is required ONLY for new construction projects whose locations (as indicated) fall within one mile of the coastal mean high water line – any water area experiencing tidal change.):~~

~~Outboard Pane = 5/16" tinted heat strengthened laminated glass with .090 PVB interlayer between and 1/2" desicant-filled aluminum spacer, with Argon filled void. Inboard Pane = 1/4" tinted tempered glazing with PPG Solarban 70 Coating on #2 surface, unless otherwise noted within the documents. (Provide obscure glazing at inboard pane at all toilet rooms, locker rooms and where indicated on drawings) Total Thickness: 1"~~

2. All windows shall be factory glazed with hermetically sealed insulating glass units with a dual seal of polyisobutylene and silicone. Glass is to be separated by a desicant - filled aluminum spacer with the void containing Argon Gas. Glass must be set into a continuous bed of silicone sealant and held in place with removable extruded aluminum snap-in beads. Wrap around (marine) glazing, which requires the removal and disassembling of the sash for re-glazing will not be acceptable. Units must be IGCC certified for a CBA rating level.

3. All glass is to be set on 1/4"-inch setting blocks.

4. All glass or panels glazed into fixed framing to receive a perimeter cap bead of silicone sealant between the glazing leg and glass or panel surface. Sealant shall be factory applied.

5. All glass or panels glazed into sliding windows are to receive a perimeter cap bead of silicone sealant between the glazing leg and glass surface. Sealant shall be factory applied.

F. Screens:

1. Screens are to be provided at kitchen areas (food preparation areas), at all administrative areas, at all classroom and instructional locations (excluding rescue windows), and all other operable window locations.

2. Screens shall be provided of manufacturer's standard approved design. Screens are intended to provide reasonable insect control and are not for the purpose to provide security or for the retention of objects or persons from the interior. Screen frame shall match adjacent window frame color and finish.

3. Screening shall be of material compatible with aluminum and conform to USDC CS 138-55, GSA FS RR-W-365, USDC CS 248-64, or GSA FS L-S-125B.

4. Full screens shall consist of 18 x 16 charcoal anodized aluminum mesh secured by vinyl spline to a nominal 5/16" x 1 1/4" x .050 extruded tubular aluminum frame. Frame color and finish to match window system exterior.

5. Screens shall be remeshable, removable from the interior, and held in place with spring-loaded plungers.

G. Other Materials:

1. Metal Insulated Panels: Insulated metal panels with window frames shall be fabricated with an outer and inner .032 thick, smooth aluminum skin, the outer skin laminated to asbestos-free mineral fiber reinforced cement board, minimum 3/16" thick, and the inner skin laminated to 1/2” thick Type ‘C’ Firecode Gypsum Board to provide a 15 minute interior flame spread rating in accordance with ASTM E-119 and ASTM E-84. The inner core shall be rigid

isocyanurate. (Insulation must have a flame spread rating of 0.25 in accordance with ASTM E-84, fuel contribution of less than 100, and smoke developed less than 450.) Total panel thickness shall be 2" or thickness as shown on drawings. Panels shall be manufactured by 'Mapes Industries', or as approved equal by the Architect. Aluminum skins shall receive a fluorpon finish (Kynar 500), both exterior and interior faces in colors as selected by the Architect.

2. Sealant: Unless otherwise indicated for sealants required within fabricated window units, provide elastomeric type as recommended by the window manufacturer for joint size and movement, to remain permanently elastic, non-shrinking and non-migrating. Provide sealant complying with AAMA 800-92.

3. Access Panels: Frames for access panels to be hollow extruded sections, with minimum wall thickness of 0.062 inches, and shall be miter-cut and assembled with stainless steel screws for ease of repair. Tamper-resistant security fastening shall be installed at the bottom of each panel to securely attach panels to sash. For safety purposes, access panels shall be encased within channels at the top and bottom to prevent the panel from falling out, even if the security fastening is removed.

4. Rescue Labels: Windows designated on drawings as *"Rescue"* or *"Egress"* windows shall meet all applicable codes and shall include a conforming label. Refer to Contract Drawings for additional information.

2.03 MANUFACTURED UNITS:

A. Horizontal Sliding (XX Configuration) Windows:

1. Dimensions: Minimum .080" wall thickness in all frame, head, and sash extrusions; sill shall be .125" minimum wall thickness high performance sill; not less than 4-1/4" frame and sash depth; unit height and width as shown on drawings. Sill frame to incorporate a closed weep flap system to allow water out, but prevent air from infiltrating in.

2. Frame Components mechanically fastened. Sash vertical members shall telescope into the sash horizontals and be mechanically fastened. Tubular sash extrusions shall have each corner mitered, reinforced with extruded aluminum corner key, hydraulically crimped, and "cold-welded" with epoxy adhesive.
   a. Mechanical fasteners, welded components, and hardware items shall be located so as to not disturb or bridge the thermal break construction of windows. Thermal barriers shall align at all frame and sash corners. All screws, nuts, washers, bolts, rivets and other fastening devices incorporated in the product shall be of sufficient strength and quality to perform their designated function. Fasteners shall be made from aluminum, non-magnetic stainless steel, or other materials warranted by the manufacturer to be non-corrosive

and compatible with aluminum window members, trim, hardware, anchors and other components of window units.

3. Glazing: "Wet glazed" with a silicone back bead compound to be GE SCS-2511 or equal. All lites (both sash and fixed) of the horizontal slider shall be inside glazed and weeped to the exterior. Refer to Item 2.02E herein and specification 08800.

5. Compression-Type Weather Stripping: Provide compressible weather stripping designed for permanently resilient sealing between adjoining window frames and/or perimeter subframe conditions. Weather stripping will be completely concealed when aluminum window is closed and installation is complete.

   a. Weather-stripping Material: Manufacturer's standard system and materials complying with AAMA/WDMA/CSA 101/I.S.2/440-11, similar or equal to *Schlegel "Q-Lon".*

5. Hardware for Horizontal Sliding Windows: Provide the following operating hardware:

   a. General: Provide manufacturer's standard hardware, fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close and securely lock aluminum windows and sized to accommodate sash and ventilator weight and dimensions. Do not use aluminum in frictional contact with other metals.

   b. Locks and Latches: Designed to allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only.

   c. Sash Rollers: Each operating sash shall operate on lubricated roller assemblies with stainless steel ball bearing rollers. There shall be a minimum of two (2) rollers per sash. Roller assemblies shall be low-friction design.

   d. Removable Lift-Out Sash: Design windows whereby both sash operate for ventilation and are removable for cleaning and maintenance, and provide with hardware to permit removal of sash from inside for cleaning.

   e. Sill Cap/Track: Removable sill insert with an extruded aluminum raised track of thickness, dimensions and profile indicated; designed to comply with performance requirements indicated and allow for drainage into the main tank and to the exterior through concealed weeps with hinged covers. Raised track must be covered with a stainless steel cap.

   f. Sash Lock: Spring-loaded black zinc die cast plunger lock with black anodized aluminum keeper on meeting rails or Spring-loaded, aluminum snap-type lock at end jamb of exterior sash at jamb. Max. lock height shall be 54" a.f.f.

   g. Limit Device: Extruded aluminum sash stop limit device;

mounted at window sill (excludes rescue windows).

6. Water control, tubular designed sill with removable cover for maintenance, separate and offset weep slots for each track, concealed exterior weep and hinged covers to allow water to drain by gravity and resist wind-driven water.

B. Fixed Windows:

1. Dimensions: Minimum .080" wall thickness in all main frame head and jambs; sill shall be .080" minimum wall thickness; sash extrusions to have minimum wall thickness of .080"; not less than 4-1/4" frame and sash depth; unit height and width as shown on drawings.

2. Frame Components mechanically fastened. Sash vertical members shall telescope into the sash horizontals and be mechanically fastened.

   a. Mechanical fasteners, welded components, and hardware items shall not bridge thermal barriers. Thermal barriers shall align at all frame and sash corners.

3. Glazing: "Wet glazed" with snap-in aluminum extruded glazing bead and PVC bulb; glass set in continuous bead of silicone back bead compound. Refer to Item 2.02E herein and specification 08800.

4. Provide *Schlegel "Fin seal"* or equal.

5. Water control, sill with weep slots and hinged covers to allow water to drain by gravity and resist wind-driven water.

C. Projected Windows:

1. Dimensions: Minimum 0.125" wall thickness in all frame head and sash extrusions and not less than 4-1/4" frame and sash depth; unit height and width as shown on drawings.

2. Frame Components mechanically fastened. Tubular sash extrusions with each corner mitered, reinforced with extruded aluminum corner key, hydraulically crimped, and "cold-welded" with epoxy adhesive.

   a. Mechanical fasteners, welded components, and hardware items designed to avoid bridging thermal barriers. Thermal barriers shall align at all frame and sash corners.
   b. Neoprene weatherstripping, minimum 2 rows, installed in dovetail grooves in sash extrusion of each sash.

3. Glazing: "Wet glazed" with snap-in aluminum extruded glazing bead and PVC bulb interior side; exterior glass set in continuous bead of silicone back bead compound, GE SCS-2511, or equal. Refer to Item 2.02E herein and specification 08800.
4. Hardware for Projected Windows:

   a. Locking Handles: Cam-type, white bronze with US25D brushed

finish, and spring-loaded catch (with pole ring for gymnasium, kitchen and auditorium windows 72" above the finished floor) and keeper, white bronze with US25D, brushed finish.

b. Operating Arms: 4-bar stainless steel arms, similar to *"Anderberg Series 301"*.

5. In each room where new projected windows are installed, provide and install one (1) 7/8" burnished aluminum window operating pole with light grey rubber tip cemented to bottom and pole hook receptor, as manufactured by *"H.B. Ives"* or approved equal.

a. Pole shall be of suitable length to accommodate existing window operating height.

D. Casement Windows:

1. Dimensions: Minimum 0.125" wall thickness in all frame head and sash extrusions and not less than 4-1/4" frame and sash depth; unit height and width as shown on drawings.

2. Frame Components shall be mortised and tendon. Tubular sash extrusions with each corner mitered, reinforced with extruded aluminum corner key, hydraulically crimped, and "cold-welded" with epoxy adhesive.

a. Mechanical fasteners, welded components, and hardware items designed to avoid bridging thermal barriers. Thermal barriers shall align at all frame and sash corners.

b. Neoprene weather-stripping, minimum two rows, installed in dovetail grooves in sash extrusion of each sash.

3. Glazing: "Wet glazed" with snap in aluminum extruded glazing bead and PVC bulb interior side. Exterior glass set in continuous bead of silicone backbed compound, GE SCS-2511 or equal. Refer to Item 2.02E herein and specification 08800.

4. Hardware for Casement Windows:

a. Locking handles: Cam-type, white bronze with US25D brushed finish.

b. Operating arm/hinge: 4-bar stainless steel arm and friction hinge, similar to *"Anderberg Series 301"*.

E. Double/Single Hung Windows:

1. Dimensions: Minimum frame and sash extrusions shall have a minimum wall thickness of 0.080". Frame sill members shall have a minimum wall thickness of 0.125". Frame depth shall be 4-1/4", typical. Unit height and width as shown on drawings.

2. Frame Components shall be mechanically fastened. Sash horizontal members shall telescope into the sash verticals and be mechanically fastened.

   a. Mechanical fasteners, welded components, and hardware items designed to avoid bridging thermal barriers. Thermal barriers shall align at all frame and sash corners.

   b. Sash shall have integral beveled edges.

3. Glazing: "Wet glazed" with snap in aluminum extruded glazing bead and PVC bulb interior side. Exterior glass set in continuous bead of silicone backbed compound, GE SCS-2511 or equal. Refer to Item 2.02E herein and specification 08800.

4. Hardware for Double/Single Hung Windows:

   a. Automatic Sill Latches shall be of white bronze with US25D brushed finish.

   b. Balances shall be *Ultra-Lift Balances*, as manufactured by *Caldwell Manufacturing Company* or as approved equal by the Architect. Balances shall be of appropriate size and capacity to hold sash in position with no movement. Sash balances shall be high performance and tested in accordance with AAMA 902-92, *Voluntary Specification for Sash Balances*. Balances shall meet all Minimum Class 5 requirements, with a minimum 0.30 Manually Applied Force rotation (MAF). Balances shall comply with AAMA 902-92, *"Voluntary Specification for Sash Balances"*, Section 8.1, and AAMA 101-88, Section 2.2.3.3.2, Class 5 and MAF ratio shall be verified by a test report from an AAMA-accredited laboratory. Size and capacity to hold all sash in position. Load bearing components of the sash attachment hardware shall be all metal; any plastic components are limited to guiding functions, and will not be considered structural. Sash attachment hardware will provide a means for field removal and installation of sash. Sash attachment hardware shall be approved by sash balance manufacturer, who will allow the use of dual pairs of *Ultra-Lift* balances, if required. Sash shall be field removable for installation and maintenance. Mounting brackets that are screw attached to sash will not be allowed.

   c. Windows that are higher than 6'-0" (overall) shall be counter-balanced with multiple *"Ultra-Lift"* balance assemblies as designed and manufactured by *Caldwell* or approved equal.

5. Weatherstrip: All primary weatherstrip shall be *Schlegel "Finseal"* or equal.

6. In each room where new double hung windows are installed, provide and install one (1) 7/8" burnished aluminum window operating pole with light grey rubber tip cemented to bottom and pole hook receptor, as manufactured by *"H.B. Ives"* or approved equal. Pole

shall be of suitable length to accommodate window operating height.

7. Water control, frame and sill with two weep slots to allow water to drain by gravity and resist wind-driven water, sash weep holes at bottom of both sash for drainage.

F. Typical for All Windows: Thermal break thermal barriers shall provide a continuous, uninterrupted thermal break around the entire perimeter of the sash and frame, regardless of the operation type.

2.04 FABRICATION:

A. General: Provide manufacturer's standard fabrication and accessories which comply with indicated standards and produces units which are reglazable without dismantling of sash framing, except to extent more specific or more stringent requirements are indicated. Include complete system for assembly of components and anchorage of window units and prepare complete preglazing at factory.

B. Sizes and Profiles: Approximate sizes for window units and profile requirements are indicated on the drawings. All sharp milled edges shall be deburred and made smooth prior to finishing. All corner joints shall be joined neatly and sealed with neoprene die-cut compression gaskets in a manner to provide a weathertight connection.

C. Thermally Improved Construction: Fabricate aluminum windows with an integral concealed low thermal barrier (products with exposed thermal barriers will not be acceptable).

1. All exterior aluminum shall be separated from interior aluminum by a rigid, structural thermal barrier. For purposes of this specification, a structural thermal barrier is defined as a system that shall transfer shear during bending and, therefore, promote composite action between the exterior and interior extrusions.
2. No thermal short circuits shall occur between the exterior and interior.
3. The thermal barrier shall be Insulbar® or equal, and shall consist of two (2) glass reinforced polyamid nylon 6/6 struts mechanically crimped in raceways extruded in the exterior and interior extrusions.
4. Poured and debridged urethane thermal barriers shall not be permitted.

D. All frame and sash members are to be continuous extrusions. The window head is to be miter cut and fastened to jambs with 1/8" thick corner keys and 4 cadmium plated or stainless steel screws into integral screw ports. Frame jambs are to be angle cut to match the sill slope and fastened with 4 cadmium plated or stainless steel screws into integral screw ports.

E. The frame sill shall slope 10 degrees to the exterior and contain integral offset weep holes that allow gravity water drainage and

resistance to wind driven water and/or air. Provide high performance sill as needed to meet window performance requirements.

F. Each operating sash shall be removable from the interior for cleaning by raising the sash 1" and pulling lower portion to the exterior.

G. All frame joints shall be hairline and be factory sealed with a sealant conforming to AAMA 800-07.

H. Mullions or Other Structural Members: When units occur that are joined by integral mullions, independent mullions, or by a combination of frame members, the resulting members shall be capable of withstanding the design pressure. Evidence of compliance may be by mathematical calculations.

I. Finish:

1. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

2. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

a. The exterior finish shall be: Superior Performance Organic Finish AA-C12C40R1x. Prepare, pretreat and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers written instructions. Fluoropolymer Two-Coat System: Manufacturers standard two-coat thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70% polyvinylidene fluoride resin by weight; complying with AAMA 2605.

~~b. Optional exterior finish shall be: Superior Performance Organic Finish AA-C12C40R1x. Prepare, pretreat and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers written instructions. Fluoropolymer Two-Coat System: Manufacturers standard two-coat thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat (Sun Storm with mica or metal flake) containing not less than 70% polyvinylidene fluoride resin by weight; complying with AAMA 2605.~~

c. The interior finish shall be: Baked Enamel Finish AA-C12C42R1x. Apply baked enamel complying with paint manufacturers written instructions for cleaning, conversion coating and painting. Organic Coating: Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 2603.

d. Colors: As selected by Architect from manufacturers standard colors. Exterior color may be different from interior color.

2.05 ACCESSORIES:

A. Casing (Panning):

1. Provide 0.08 inch minimum wall thickness extruded aluminum to cover exterior casings. Aluminum sections shall be of one piece design to lock around the entire window frame for a water-tight connection. Contoured profiles of casing covers shall be as shown on the drawings.
2. The casing covers shall be assembled using stainless steel screws into integral screw ports, with joints back-sealed.
3. Flanged frame, brake metal, exposed fastenings and other alternatives will not be acceptable as a substitution for the specified casing cover system.

B. Exterior Mullion Covers: Exterior mullion covers shall be extruded aluminum shapes. The wall thickness shall be no less than 0.062 inches.

C. Receptors and Sub-Sills:

1. Where indicated on the drawings, extruded aluminum receptors with a minimum wall thickness of 0.94 inches shall be provided at all heads and jambs of the window openings. The base section of the receptor must be secured to the surrounding conditions. The snap-in portion of the receptor must be designed to not require any fastenings.
2. Where indicated on the drawings, extruded aluminum subsills with minimum wall thickness of 0.094 inches shall be provided. Subsills must be designed to able to drain any water that enters the window system by way of weep slots with hinged covers. All subsills are required to have end damns and must be sealed watertight.

D. Interior Trim: Interior trim, closures and angles shall be as shown on the drawings and of aluminum extruded shapes. Minimum thickness for all interior trim is .062 inches.

PART 3 - EXECUTION

3.01 INSPECTION:

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

B. Openings shall be verified by Contractor and/or General Contractor to be within allowable tolerances, plumb, level, clean, providing a solid anchoring surface, and in accordance with approved shop drawings. Unsatisfactory conditions shall be corrected prior to installation.

D. For window replacement projects, existing windows shall not be removed until the new replacement windows are available and ready for immediate installation. Openings shall not be left uncovered at the end of the working day, during wind driven precipitation, or very cold weather. Existing window removal and replacement with new windows for any individual room shall be done within the same day.

E. Perform all other operations that are necessary to prepare openings for proper installation and operation of new window sills.

F. For projects which contain hazardous window materials identified by the pre-construction test results: Contractor shall note well that this contract calls for the complete removal of all existing window sashes in a complete and intact condition. Should any existing sash fragment or break prior to disposal, the Contractor shall immediately stop all work and contact the Owner’s on-call Project Manager for review and direction.

3.02 INSTALLATION:

A. Install the work of this section in strict accordance with the manufacturer's recommendations, approved shop drawings, and all pertinent regulations and codes.

B. All window and related window components shall be installed in accordance with the requirements of the Owner and the approved shop drawings of the manufacturer. All installations shall be by the window manufacturer, or their approved representative, using mechanics skilled and experienced in the erection of aluminum window units.

C. Set units plumb, level, and true to line, (relative to building structure) without warp or rack of frames, sash, or panels. Anchor securely in place to prevent distortion or misalignment. The maximum variation from plumb and level shall not exceed 1/8” (plus or minus) in ten (10) feet.

D. Fiberglass insulation shall be compressed between new window frame and existing construction or between frame and new blocking as applicable. Approved insulation materials (R-19 or better) shall be installed in the frame cavity on the interior portion of the window frame. Area adjacent to the exterior of the window frame shall remain un-insulated. The window installer shall use caution in the insulation operation to avoid overlapping insulation materials across the thermal break connector, thus bridging the two separated frame members.

E. Aluminum shall be insulated from direct contact with steel, masonry, concrete, or non-compatible materials by bituminous paint, zinc chromate primer, or other suitable insulating material.

F. Exterior joints between windows and surrounding construction shall be sealed per specifications and approved shop drawings.

G. Joint Sealant Application:

1. Joints and surfaces to receive sealants shall be dry, clean, and free from loose material, efflorescence, or mortar leaching. Sealants shall not be applied when temperature is below sealant manufacturer's recommendations.

2. A Grade "A" type caulking compound from *Pecora, Tremco, Vulkem* or equal, as approved by the Architect, shall be applied per the installation drawings and details at all points where the aluminum master frame and/or panning intersects the masonry or other exterior wall finish. The caulking material shall be applied in a manner which insures a continuous air and water tight perimeter seal. Color to match the color of the aluminum windows, unless specified otherwise by the Architect.

H. Exposed Fastener Concealment: Note: No exposed fasteners shall be allowed at any aluminum assemblies. The Contractor shall supply and install all concealment panning as required to fully enclose any exposed fasteners which may be a result of the system installations. The panning enclosures shall be of identical material in both composition and appearance, as the aluminum systems specified herein, in order to provide a seamless, and professional installation.

3.03 DISPOSAL AND CARTING:

A. Existing windows and all other materials removed as a part of the requirements of this Contract shall be removed from the site and become the property of the Contractor upon their removals. The Contractor shall promptly remove and legally dispose of said materials at no additional cost to the Owner.

B. Comply with all applicable laws, rules and regulations as they pertain to the legal disposal of waste materials of the type produced by the work of this Section.

3.04 FIELD TESTS:

A. Air infiltration tests conducted per ASTM E 783-81, and water resistance test conducted per AAMA 501.3, shall be performed to AAMA standards. Field test shall be performed by an AAMA-accredited, certified architectural testing laboratory in accordance with AAMA 502-90 standards, and conducted with the window manufacturer representative present. The Architect shall randomly select one pair of adjacent windows to be tested. The cost for only the initial test to be borne by the Owner; any additional testing required or corrective measures for non-conforming work shall be the responsibility of the window Contractor.

B. If a test specimen should fail any aspect of the field test, the test specimen shall be repaired or replaced and re-tested. At the Architect's discretion, up to three (3) additional windows may be tested. Subsequent to testing, all window units shall be repaired or replaced in the same manner as the test specimen(s) to assure

compliance with project performance specifications.

C. The cost of re-testing and all subsequent repairs shall be borne by the window manufacturer and the window Contractor.

3.05 ADJUSTING AND CLEANING:

A. After installation, the erector shall remove all sealants, caulking and other misplaced materials from all surfaces, including adjacent work. The window frame and glass shall be cleaned thoroughly with materials and methods recommended by the window and glass manufacturers, and shall not cause any defacement of the work. All hardware and moving parts shall be completely lubricated.

B. Frames and balances shall be adjusted, if necessary, after installation to insure smooth and weather-tight operation.

C. Lubricate hardware and moving parts.

D. Clean aluminum surfaces and remove excess sealant.

E. Remove all debris caused by the work of this section.

F. Upon completion of cleaning efforts, leave windows in closed position.

3.06 ADDITIONAL REPLACEMENT SASH

A. As a part of each Base Bid, the Contractor shall supply to the Owner 5% additional replacement sash for each window type as shown on the Contract Documents. No less than one (1)

B. The Contractor shall purchase and have all replacement sash delivered on-site at the time of main delivery of the primary window units. The Contractor shall deliver the replacement sash to a location as designated by the Owner’s Representative. He shall have the delivery signed for and authorized by the Owner’s Representative as received. Said manifest/delivery ticket shall be submitted to the Owner’s Representative with associated pay requisitions as substantiation and proof of delivery.

3.07 MAINTENANCE AND OPERATION INSTRUCTIONS:

A. The Contractor shall instruct the Owner's maintenance staff on the care, maintenance, and operation of the installed window system including, but not limited to: cleaning and replacement of glazing, periodic lubrication of hardware, and balance adjustment.

END OF SECTION

DIVISION 8 – DOORS & WINDOWS

SECTION 08525 - TSS BULLET RESISTANT ALUMINUM VOICE AROUND TRANSACTION WINDOW ASSEMBLY

PART 1 – GENERAL

1.01 REFERENCE

A. Underwriters Laboratory UL 752-Standard for Bullet Resisting Equipment & ASTM E119-98- Standard Test Methods for Fire Tests of Building Construction and Materials, NIJ Standard 0108.01- (National Institute of Justice) Standard for Ballistic Resistant Protective Materials, ASTM B 209/B 209M- Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate, ASTM A 666- Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar..

1.02 SUBMITTALS

A. The following shall be submitted by the manufacturer in accordance with Sections 13070 and any Special Contract Requirements and coordinate with Sections 01340: Submit for approval prior to fabrication: samples, product data (including preparation, storage and installation methods), cuts & anchor spacing, reinforcement & location , product specifications, shop drawings, test reports (current UL Listing Verification & UL 752 Test Results as provided by Underwriters Laboratories), and printed data in sufficient detail to indicate compliance with the contract documents.

B. Manufacturer's Instructions for installation and cleaning of TSS Bullet Transaction Window Assemblies. All required submittals shall be approved prior to installation.

1.03 DESIGN PERFORMANCE

A. Through the design, manufacturing techniques and material application the TSS Aluminum Voice Around Transaction Window shall be of the "non-ricochet" type. This design is intended to permit the encapture and retention of an attacking projectile lessening the potential of a random injury or lateral penetration. This assembly shall provide single transaction positions utilizing the "natural voice rail" configuration. This design shall employ mounting blocks in vertical framing tubes to complete the "natural voice rail" design. Each transaction position shall have a stainless steel dip tray as shown on the drawings. Components must be manufactured in strict accordance with the specifications, design and details. All vision panels

shall be cut to size with all exposed edges polished. Necessary holes shall be pre drilled and tapped where required. Stainless Steel assembly screws and acrylic spacers shall be provided. Clear anodized angles and channels shall be provided. Anchor screws shall be provided by the installer.

B. No field alterations to the construction of the units fabricated under the acceptable standards shall be allowed unless approved by the manufacturer and the architect. Standard manufacturing tolerances shall be +/- 1/16".

C. Materials shall meet or exceed UL 752 requirements.

1.04 QUALITY ASSURANCE

A. Manufacturer shall be a Company that specializes in manufacturing products of the specified type with a minimum of five years experience. Installer shall be a Company that specializes in product type specified and Certified for the installation by the manufacturer. Manufacturer shall provide a Mock-up, if required, for evaluation of surface preparation and application workmanship and color/finish to the Architect for approval prior to start of work.

1.05 DELIVERY, STORAGE & HANDLING

A. Delivery the materials to the project with the manufacturer's UL Listed Labels intact and legible. Handle the materials with care to prevent damage. Store materials inside and under cover, stack flat and off floor. Project conditions (temperature, humidity, and ventilation) shall be within the maximum limit recommendations set by manufacturer. Do not install products that are under conditions outside these limits.

1.06 WARRANTY

A. All materials shall be warranted against defects for a period of 1 year for the date of receipt at the project site. Certificates of manufacturer's standard limited warranty shall be provided at project completion.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Products shall be manufactured by: Total Security Solutions, Inc, 170 National Park Drive, Fowlerville, MI 48836, 866-930-7807. Jim Richards, info@demandtss.com . Web: www.tssbulletproof.com . No substitutions shall be accepted.

2.02 BULLET RESISTANT ALUMINUM VOICE AROUND TRANSACTION WINDOW

A. Product shall be: TSS AVA Aluminum Voice Around Transaction Window:. All aluminum transaction window allows for natural voice communication without a breach of security. Available in a clear or bronze aluminum finish, incorporates either a plastic laminate or stainless steel counter.

B. Glazing Panels shall be *Bullet Resistant Level 3,* 1 1/4" LP 1250 Laminated as shown on the drawings.

C. Aluminum sections to be manufactured in accordance with ASTM B209, Extruded aluminum alloy 6063 T5 Anodized or powder coated finish to match the existing décor and be free of sharp edges or burrs when in place. Glazing Channel: U-Channel specifically designed for securing transparencies tightly in place. Angles and stops are only acceptable for top attachment.

1. Frame to be anodized aluminum 18 ga. stainless steel. The bottom of the glazing to be capped with corresponding material on the frame (ie: stainless steel on stainless steel). Provide a shelf 2" thick with a recessed deal tray. The shelf to be full width of window, 12" deep, centered under the glazing and covered with a stainless steel 18 ga. #4 finish).

2. Deal tray to be 18 ga. stainless steel, # 4 finish 16" x 10" from the outside edge of flanges with a clear opening with a stainless steel counter.

D. Product size shall be: TSS AVA Aluminum Voice Around Transaction Window

1. Size shall be custom 27¾″x 51½″.

2. Color shall be clear.

PART 3 – EXECUTION

3.01 PREPARATION

A. Prior to installing the bullet resistive material, the contractor shall verify that all supports have been installed as required by the contract documents, architectural drawings, and approved shop/CAD drawings, if required. Installer shall notify architect of any unsatisfactory preparation that is responsibility of another installer.

B. Clean and prepare all surfaces per manufacturers recommendations for achieving the best results for the substrate under the project conditions.

3.02 INSTALLATION

A. Do not begin installation until openings have been verified and surfaces properly prepared in accordance with Drawings. Install in accordance with manufacturer's instructions and UL 752. Set all equipment plumb. All products shall be installed per installation instructions provided by Total Security Solutions, if warranty is to be issued.

B. TSS AVA Aluminum Voice Around Transaction Window: shall arrive on site as a completed unit. Unit shall be installed in provided opening (wall/door), secured to structure (anchors by others).

3.03 POST APPLICATION

A. TSS AVA Aluminum Voice Around Transaction Window shall be installed in accordance with manufacturer's printed recommendations, including adhering to anchoring and finishing details.

B. Inspection and Cleaning: Verify installation is complete and complies with manufacturer's requirements. Clean product and accessories, removing excess sealant, labels and protective covers.

C. Touch-up, repair or replace damaged products before Substantial Completion.

D. Product Warranty: Applicable warranty shall be issued to owner upon final release of completed project.

END OF SECTION

DIVISION 8 DOORS AND WINDOWS
SECTION 08631 – ALUMINIUM CLAD WINDOWS

Part 1 General

1.1 Section Includes

A. Ultimate Single Hung G2, , window complete with hardware, glazing, certified mulls, weather strip, insect screen, simulated divided lite, jamb extension, and standard or specified anchors, trim, attachments, and accessories

1.2 Related Sections

A. Section 00000 - General Requirements-BBS

B. Section 01616 - Clean-Up Procedures

C. Section 07900 - Caulking

D. Section 07910 - Joint Sealers

E. Section 09900 - Painting

1.3 References

A. American Society for Testing Materials (ASTM):

1. E283: Standard Test method for Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors

2. E330: Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Door by Uniform Static Air Pressure Difference

3. E547: Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Differential

4. E2190: Specification for Sealed Insulated Glass Units

5. C1036: Standard Specification for Flat Glass

6. E2068: Standard Test Method for Determination of Operating Force of Sliding Windows and Doors

7. E 1996: Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes

8. E 1886: Standard Test method for Performance of Exterior Windows, curtain Walls, and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials

9. F 2090-17: Standard Specifications for Windows Fall Prevention Devices with Emergency Escape (egress) Release Mechanisms

A. American Architectural Manufacturer's Association/Window and Door Manufacturer's Association (AAMA/WDMA/CSA):

1. AAMA/WDMA/CSA 101/I.S.2/A440-08, Standard/Specification for windows, doors and skylights

2. AAMA/WDMA/CSA 101/I.S.2/A440-11, Standard/Specification for windows, doors and skylights

3. AAMA 450-10, Voluntary Performance Rating Method for Mulled Fenestration Assemblies

B. WDMA I.S.4: Industry Standard for Water Repellant Preservative Treatment for Millwork

C. Window and Door Manufacturer's Association (WDMA): 101/I.S.2 WDMA Hallmark Certification Program

D. Sealed Insulating Glass Manufacturer's Association/Insulating Glass Certification Council (SIGMA/IGCC)

E. American Architectural Manufacturer's Association (AAMA): 2605: Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels

F. National Fenestration Rating Council (NFRC):

1. 101: Procedure for Determining Fenestration Product thermal Properties

2. 200: Procedure for Determining Solar Heat Gain Coefficients at Normal Incidence

G. Window Covering Manufacturer's Association

1. A100.1: American National Standard for Safety of Corded Window Coverings Products

1.4 System Description

A. Design and Performance Requirements:

Product	Air Test to PSF	Water Tested to psf	Structural Tested to psf	Certification Rating	Design Pressure	Overall Width		Overall Height	
						in	mm	in	mm
Ultimate Double Hung G2 (4450)	1.57	7.5	75	LC-PG50	DP50	49 1/4	(1251)	107 1/2	(2731)
Ultimate Double Hung G2 (5456)	1.57	6	60	LC-PG35	DP35	59 1/4	(1505)	119 1/2	(3035)
Ultimate Double Hung G2 (5044) *	1.57	6	60	LC-PG35	DP35	55 1/4	(1403)	95 1/2	(2426)
Ultimate Double Hung G2 (4826) CW Performance	1.57	7.5	75	CW-PG50	DP50	53 1/4	(1353)	59 1/2	(1511)
Ultimate Double Hung G2 (4848) CW Performance	1.57	7.5	75	CW-PG50	DP50	53 1/4	(1353)	103 1/2	(2629)
Ultimate Double Hung G2 (5056) CW Performance	1.57	7.5	60	CW-PG40	DP40	55 1/4	(1403)	119 1/2	(3035)
Ultimate Double Hung G2 (5456) CW Performance	1.57	7.5	45	CW-PG30	DP30	59 1/4	(1505)	119 1/2	(3035)

*Tested with the Performance Bracket Removed

Provide Performance information when testing with AAMA/WDMA/CSA 101/I.S.2/A440 meeting U-factor 0.30, Solar Heat Gain Coefficient 0.27. Visible light transmittance 0.46. condendation resistance: 56

1.5 Submittals

A. Shop Drawings: Submit shop drawings under provision of Section 01 33 23

B. Product Data: Submit catalog data under provision of Section 01 33 23

C. Samples:

1. Submit corner section under provision of section 01 33 23

2. Include glazing system, quality of construction and specified finish

D. Quality Control Submittals: Certificates: submit manufacturer's certification indicating compliance with specified performance and design requirement under provision of section 01 33 23

1.6 Quality Assurance

A. Requirements: consult local code for IBC [International Building Code] and IRC [International Residential Code] adoption year and pertinent revisions for information on:

1. Egress, emergency escape and rescue requirements

2. Basement window requirements

3. Windows fall prevention and/or window opening control device requirements

1.7 Delivery

A. Comply with provisions of Section 01 65 00

B. Deliver in original packaging and protect from weather

1.8 Storage and Handling

A. Prime and seal wood surfaces, including to be concealed by wall construction, if more than thirty (30) days will expire between delivery and installation

B. Store window units in an upright position in a clean and dry storage area above ground to protect from weather under provision of Section 01 66 00

1.9 Warranty

Complete and current warranty information is available at marvin.com/warranty. The following summary is subject to the terms, condition, limitations and exclusions set forth in the Marvin Windows and Door Limited Warranty and Products in Coastal Environments Limited Warranty Supplement:

A. Clear insulating glass with stainless steel spacers is warranted against seal failure caused by manufacturing defects and resulting in visible obstruction through the glass for twenty (20) years from the original date of purchase. Glass is warranted against stress cracks caused by manufacturing defects from ten (10) years from the original date of purchase.

B. Standard exterior aluminum cladding finish is warranted against manufacturing defects resulting in chalk, fade and loss of adhesion (peel) per the American Architectural Manufacturer's Association (AAMA) Specification 2605-11 Section 8.4 and 8.9 for twenty (20) years from the original date of purchase.

C. Factory-applied interior finish is warranted to be free from finish defects for a period of five (5) years from the original date of purchase.

D. Hardware and other non-glass components are warranted to be free from manufacturing defects for ten (10) years from the original date of purchase.

Part 2 Products

2.1 Manufactured Units

A. Description: Ultimate Double Hung G2, Single Hung (and related stationary units) as manufactured by Marvin, Warroad, Minnesota.

2.2 Frame Description

A. Interior: Non Finger-Jointed Pine or finger-jointed core with non finger-jointed Pine veneer;

1. Kiln-dried to moisture content no greater than 12 percent at the time of fabrication

2. Water repellant, preservative treated in accordance with ANSI/WDMA I.S.4.

B. Frame exterior aluminum clad with 0.050" (1.3mm) thick extruded aluminum

C. Frame thickness: 11/16” (17mm) head and jambs

D. Frame depth: Frame depth had an overall 5 21/32” jamb (144mm). 4 9/16” (116mm) jamb depth from the nailing fin plane to the interior face of the frame for new construction.

E. Sill assembly including the sill liner: 2 7/32” (56mm)

2.3 Sash Description

A. Interior: Non Finger-Jointed Pine or finger-jointed core with non finger-jointed Pine veneer;

1. Kiln-dried to moisture content no greater than 12 percent at the time of fabrication

2. Water repellant preservative treated with accordance with WDMA I.S.4.

B. Sash exterior aluminum clad with 0.050” (1.3mm) thick extruded aluminum

C. Sash thickness: 1 3/4” (44mm). Corner slot and tenoned.

D. Operable sash tilt to interior for cleaning or removal

E. Sash Options:

a. Standard: Equal Sash

b. Optional:

i. Unequal Sash

ii. Both Sash Stationary

F. Exterior Cope Profile: Putty

G. Interior Sash Sticking

1. Standard: Ogee

2.4 Glazing

A. Select quality complying with ASTM C1036. Insulating glass SIGMA/IGCC certified to performance level CBA when tested in accordance with ASTM E2190.

B. Glazing method: Insulating glass

C. Glazing seal: Silicone bedding on interior and exterior

D. Glass Type: Low E2 with Argon, Tempered Low E2 with Argon

2.5 Certified Mulling

A. Directional mull limits: 1 High (can be 2 or more units wide in an assembly)

1. Max mullion span is 71 ½" (1816mm); max tributary width 45 ¼" (1149mm)

2. CUDH NG 2.0 to CUDH NG 2.0 only

3. Certified to Design Pressure 50

A. Directional mull limits: 1 Wide (can be 2 or more units high in an assembly)

1. Max mullion span is 69 ¼" (1759mm); max tributary height 53 19/32" (1361mm)

2. CUDH NG 2.0 over CUDH NG 2.0 only

3. Certified to Design Pressure 50

B. Multiple Wide x Multiple High assemblies with 1" LVL

1. Max mullion span is 75 11/16" (1922mm); max tributary width is 45 1/4" (1149mm)

2. LVL must be in vertical mull

3. Certified to Design Pressure 50

C. Multiple Wide x Multiple High assemblies with 3/8" (10mm) MRF

1. Max mullion span is 83 11/16" (2125mm); max tributary width 45 1/4" (1149mm)

2. CUDH NG 2.0 over CUDH NG 2.0 only

3. Certified to Design Pressure 65

D. If any units have a lower design pressure the entire assembly will have the lowest design pressure of any unit or mull in the assembly.

2.6 Finish

A. Exterior: Aluminum clad. Fluoropolymer modified acrylic topcoat applied over primer. Meets AAMA 2605 requirements.

1. Aluminum clad color: Stone White

B. Interior Finish :

1. Prime: Factory-applied enamel primer. Available on Pine product only. Meets WDMA TM-11 requirements.

2. Painted Interior Finish Meets WDMA TM-14 requirements.

.

2.7 Hardware

A. Locking system that provides locking, unlocking, balancing, and tilting of the sash members

B. Bottom Rail Lock Actuator Assembly - **Lift Lock**

1. Material

a. Zinc die-cast
b. Available finishes: Satin Taupe, White, Bronze, Matte Black, Brass, Antique Brass, Polished Chrome, Satin Chrome, Oil Rubbed Bronze, or Satin Nickel

2. Design Feature and Components

a. Does not contain Check Rail Lock Actuator Assembly or Strike Assembly

b. Traditional hardware design option

c. To unlock unit, lift the lock

d. Lock automatically locks when bottom sash is closed.

e. To tilt the bottom sash for wash mode, raise the bottom sash and manually retract the latches.

f. Custodial hardware colors (available with traditional design): Satin Taupe, White, Bronze, Matte Black

g. Two per unit

C. Latches

1. Bottom sash latch

a. Material

i. Bolt: Glass-filled nylon

ii. Latch housing: Acetal

iii. Sash latch reinforcement: Stainless steel

2. Top sash tilt latch

a. Material

i. Bolt: Glass-filled nylon

ii. Latch housing: Glass-filled nylon

3. Latches accommodate travel of sash in frame, and tilting into wash-mode

4. Color: Beige (manual latch for Lift Lock also available in White and Black)

D. Strike Assembly

1. Material

a. Zinc die-cast strike plate and injection-molded Acetal housing and button

b. Available finishes: Satin Taupe, White, Bronze, Matte Black, Brass, Antique Brass, Polished Chrome, Satin Chrome, Oil Rubbed Bronze, or Satin Nickel

2. Strike assembly accommodates locking/unlocking

E. Balance System (balance system determined by sash weight)

1. Block & tackle balances

2. Hybrid spiral balances

F. Sash Limiter

1. Bottom Sash Limiter (Acetal)

a. Available on all operator configurations, and StormPlus IZ3

b. Selectable bottom sash locations, 4", 6" or 8" Net Clear Opening (NCO)

c. Non-tilt hardware is default, and a sash removal tool is required in order to by-pass the Sash limiter for sash removal (tilt wash mode)

d. Standard application is factory applied. Available for field retrofit applications.

e. Color: Will align with the Exterior Weather Strip Package select

2.8 Weather Strip

A. Operating units:

1. Jambs: Foam-filled bulb

2. Header: Continuous dual leaf

3. Bottom rail and check rail: Hollow bulb

B. Stationary units:

1. Jambs: Foam for picture units; foam-filled bulb for transom unit

2. Header and bottom rail: Hollow bulb

2.9 Jamb Extension

A. Jamb extensions are available for various wall thickness factory-applied up to a 14” (356mm) wide

B. Finish: Match interior frame finish

2.10 Insect Screen

A. Factory-installed half screen. Half screen covers sash opening.**Provide no screen on rescue window.**

1. Screen Mesh: Charcoal Fiberglass

B. Aluminum frame finish:

1. Color: Matches exterior aluminum clad color

2. Aluminum frame finish: Bronze, White

1. Optional Shade Cover

2.11 Simulated Divided Lites (SDL)

A. 1 1/8” (29mm) wide with internal spacer bar

B. Exterior muntins: 0.050” (1.3mm) thick extruded aluminum

C. Interior muntins: Pine

D. Muntins adhere to glass with closed-cell copolymer acrylic foam tape

E. Exterior sticking: Putty

F. Interior Sticking:

1. Standard: Ogee

G. Patterns: Rectangular

H. Finish – exterior matches exterior aluminum clad color, interior matches interior wood species and color

2.12 Accessories and Trim

A. Installation Accessories:

1. Factory-installed vinyl nailing/drip cap

2. Installation brackets: 6 3/8” (162mm), 9 3/8” (283mm), 15 3/8” (390mm)

3. Masonry brackets: 6” (152mm), 10” (254mm)

B. Aluminum Extrusions:

1. Casing Profile: Stratton Casing with A1452 subsill, Stratton casing with A7830 subsill

2. Aluminum clad Extrusion: Frame Expander, Jamb Extender, Mullion Cover, Mullion Expander, Subsill, Subsill End Cap and Lineal Cap

3. Finish: Fluoropolymer modified acrylic topcoat applied over primer. Meets AAMA 2605 requirements

4. To match aluminum clad exterior color

Part 3 Execution

3.1 Examination,

A. Verification of Condition: Before installation, verify openings are plumb, square and of proper dimensions as required in Section 01 71 00. Report frame defects or unsuitable conditions to the General contractor before proceeding.

B. Acceptance of Condition: Beginning on installation confirms acceptance of existing conditions.

3.2 Installation

A. Comply with Section 01 73 00.

B. Assemble and install window/door unit(s) according to manufacturer's instruction and reviewed shop drawing.

C. Install sealant and related backing materials at perimeter of unit or assembly in accordance with Section 07 92 00 Joint Sealants.

D. Install accessory items as required.

E. Use finish nails to apply wood trim and mouldings.

3.3 Field Quality Control

A. Remove visible labels and adhesive residue according to manufacturer's instruction.

B. Unless otherwise specified, air leakage resistance tests shall be conducted at a uniform static pressure of 75 Pa (~1.57 psf). The maximum allowable rate of air leakage shall not exceed 2.3 L/sm^2 (~0.45 cfm/ft^2).

C. Unless otherwise specified, water penetration resistance testing shall be conducted per AAMA 502 and ASTM E1105 at 2/3 of the fenestration products design pressure (DP) rating using "Procedure B" – cyclic static air pressure difference. Water penetration shall be defined in accordance with the test method(s) applied.

3.4 Cleaning

A. Remove visible labels and adhesive residue according to manufacturer's instruction.

B. Leave windows and glass in a clean condition. Final cleaning as required in Section 01 74 00.

3.5 Protecting Installed Construction

A. Comply with Section 07 76 00.

B. Protecting windows from damage by chemicals, solvents, paint or other construction operations that may cause damage.

End of Section

DIVISION 8 - DOORS AND WINDOWS

SECTION 08710 - FINISH HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions of Division 1 Specification Sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Definition: "Finish Hardware" includes items known commercially as finish hardware which are required for swing, sliding, and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame.

B. Extent of finish hardware required is indicated on drawings and in schedules.

C. Types of finish hardware include the following:

1. Hinges.
2. Pivots.
3. Lock cylinders and keys.
4. Lock and latch sets.
5. Bolts.
6. Exit devices.
7. Push/pull units.
8. Closers.
9. Miscellaneous door control devices.
10. Door trim units.
11. Protection plates.
12. Weatherstripping for exterior doors.
13. Sound stripping for interior doors.
14. Automatic drop seals (door bottoms).
15. Astragals or meeting seals on pairs of doors.
16. Thresholds.
17. Security products.

D. Silencers included integral with hollow metal frames are specified with door frames elsewhere in Division 8.

E. Weatherstripping included integral with hollow metal frames are specified with door frames elsewhere in Division 8.

F. Automatic door operators are specified elsewhere in Division 8.

1.03 QUALITY ASSURANCE

A. Manufacturer: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer, although several

may be indicated as offering products complying with requirements.

B. Supplier: A recognized architectural finish hardware supplier, with warehousing facilities, who has been furnishing hardware in the project's vicinity for a period of not less than 2 years, and who is, or who employs an experienced architectural hardware consultant who is available, at reasonable times during the course of the work, for consultation about project's hardware requirements, to Owner, Architect, and Contractor.

C. Fire Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80 and local building code requirements. Provide only hardware which has been tested and listed by UL or FM for types and sizes of doors required and complies with requirements of door and door frame labels.

1. Where emergency exit devices are required on fire-rated doors (with supplementary marking on doors' UL or FM labels indicating "Fire Door to be Equipped with Fire Exit Hardware"), provide UL or FM label on exit devices indicating "Fire Exit Hardware".

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data for each item of hardware in accordance with Division 1 Section "Submittals". Include whatever information may be necessary to show compliance with requirements and include instructions for installation and for maintenance of operating parts and finish.

B. Hardware Schedule: Submit final hardware schedule in manner indicated below. Coordinate hardware with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of hardware.

C. Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:

1. Type, style, function, size, and finish of each hardware item.

2. Name and manufacturer of each item.

3. Fastenings and other pertinent information.

4. Location of hardware set cross-referenced to indications on drawings, both on floor plans and in door and frame schedule.

5. Explanation of all abbreviations, symbols, codes, etc. contained in schedule.

6. Mounting locations for hardware.

7. Door and frame sizes and materials.

8. Keying information.

D. Submittal Sequence: Submit schedule at earliest possible date, particularly where acceptance of hardware schedule must precede fabrication of other work (e.g. hollow metal frames) which is critical in the project construction schedule. Include with the schedule the product data, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.

E. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

F. Samples: Prior to submittal of the final hardware schedule and prior to final ordering of finish hardware, submit one sample of each type of exposed hardware unit, finished as required, and tagged with full description of coordination with schedule.

1. Samples will be returned to the supplier. Units which are acceptable and remain undamaged through submittal, review, and field comparison procedures may, after final check of operation, be used in the work, within limitations of keying coordination requirements.

G. Templates: Furnish hardware templates to each fabricator of doors, frames, and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of such other work to confirm that adequate provisions are made for proper location and installation of hardware.

1.05 PRODUCT HANDLING

A. Tag each item or package separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.

B. Packaging of hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packaged in same container.

C. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.

D. Provide secure lock-up for hardware delivered to the project but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.

PART 2 - PRODUCTS

2.01 RESPONSIBILITIES OF CONTRACTOR

A. Submittals: Coordinate and process submittals for Builders Hardware in same manner as submittals for other work.

B. Construction Schedule: Cooperate with Finish Hardware supplier in establishing scheduled dates for submittals and delivery of templates and finish hardware.

C. Coordination: Coordinate finish hardware with other work. Furnish hardware supplier or manufacturer with shop drawings of other work where required or requested. Verify completeness and suitability of hardware with supplier.

D. Product Handling: Provide secure lock-up for hardware delivered to the site. Inventory hardware jointly with representative of hardware supplier and issue signed receipts for all delivered materials. Any hardware items lost, damaged, or stolen after being accepted by Contractor shall be replaced at the Contractor's expense.

E. Installation Information: The general types and approximate quantities of hardware required for this project are indicated at the end of this section in order to establish Contractor's costs for installation and other work not included in allowance.

2.02 SCHEDULED HARDWARE

A. Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of finish hardware is indicated in the Finish Hardware Data Sheet and Hardware Schedule at the end of this section. Products are identified by using hardware designation numbers of the following:

1. Manufacturer's Product Designations: One or more manufacturers are listed for each hardware type required. An asterisk (*) after a manufacturer's name indicates whose product designation is used in the Hardware Schedule for purposes of establishing minimum requirements. Provide either the product designated, or, where more than one manufacturer is listed, the comparable product of one of the other manufactures which comply with requirements including those specified elsewhere in this section.

2. ANSI/BHMA designations used elsewhere in this section or in schedules to describe hardware items or to define quality or function are derived from the following standards and requirements specified elsewhere in this section:

a. Butts and Hinges: ANSI A156.1 (BHNA 101).

b. Locks and Lock Trim: ANSI A156.2 (BHMA 601).

c. Exit Devices: ANSI A156.3 (BHMA 701).

d. Door Controls--Closers: ANSI A156.4 (BHMA 301).

e. Auxiliary Locks: ANSI A156.5 (BHMA 501).

f. Architectural Door Trim: ANSI A156.6 (BHMA 1001).

g. Template Hinge Dimensions: ANSI A156.7.

h. Door Controls--Overhead Holders: ANSI A156.8 (BHMA 311).

i. Interconnected Locks and Latches: ANSI A156.12 (BHMA 611).

j. Mortise Locks and Latches: ANSI A156.13 (BHMA 621).

k. Closer Holder Release Devices: ANSI A156.15 (BHMA 321).

l. Auxiliary Hardware: ANSI A156.16 (BHMA 1201).

m. Self Closing Hinges and Pivots: ANSI A156.17 (BHMA 1101).

3. Materials and Finishes: ANSI A156.18 (BHMA 1301).

2.03 MATERIALS AND FABRICATION

A. General:

1. Hand of door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

2. Manufacturer's Name Plate: Do not use manufacturer's products which have manufacturer's name or trade name displayed in a visible location (omit removable nameplates), except in conjunction with required UL labels and as otherwise acceptable to Architect.

3. Manufacturer's identification will be permitted on rim of lock cylinders only.

4. Base Metals: Produce hardware units of basic metal and forming method indicated, using temper and hardness, but in no case of lesser (commercially recognized) quality than specified for the applicable hardware units by applicable ANSI A156 series standard for each type hardware item and with ANSI A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.

5. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.

6. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared to paint" in surfaces to receive painted finish.

7. Provide concealed fasteners for hardware units which are exposed when door is closed, except to the extent no standard units of the type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex screw fasteners.

8. Tools and Maintenance Instructions for Maintenance: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of finish hardware.

2.04 HINGES, BUTTS, AND PIVOTS

A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

B. Screws: Furnish Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.

C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

1. Steel Hinges: Steel pins.

2. Non-ferrous Hinges: Stainless steel pins.

3. Exterior Doors: Non-removable pins.

4. Out-swing Corridor Doors: Non-removable pins.

5. Interior Doors: Non-rising pins.

6. Tips: Flat button and matching plug, finished to match leaves, except where hospital tip (HT) indicated.

7. Number of Hinges: Provide number of hinges indicated but not less than 3 hinges for door leaf for doors 90" or less in height and one additional hinge for each 30" of addition height.

2.05 LOCK CYLINDERS AND KEYING

A. General: Supplier will meet with Owner to finalize keying requirements and obtain final instructions in writing.

B. Review the keying system with the Owner and provide the type required (master, grandmaster, or great-grandmaster), integrated with Owner's existing system.

C. Equip locks with manufacturer's special 6-pin tumbler cylinder, with construction master key feature, which permits voiding of construction keys without cylinder removal.

D. Equip locks with high security cylinders which comply with performance requirements for Grade 1 cylinders as listed in ANSI A156.5 and which have been tested for pick and drill resistance requirements of UL 437 and are UL listed.

E. Metals: Construct lock cylinder parts from brass/bronze, stainless steel, or nickel silver.

F. Comply with Owner's instructions for masterkeying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group of related locks.

1. Permanently inscribe each key with number of lock that identifies cylinder manufacturer key symbol and notation "DO NOT DUPLICATE".

G. Key Material: Provide keys of nickel silver only.

H. Key Quantity: Furnish 3 change keys for each lock; 5 master keys for each master system, and 5 grandmaster keys for each grandmaster system.

1. Furnish one extra blank for each lock.

2. Deliver keys to Owner's representative.

I. Provide a key control system including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150 percent of the number of locks required for the project.

1. Provide four hinged panel type cabinet for wall mounting.

2.06 LOCKS, LATCHES, AND BOLTS

A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.

B. Lock Throw: Provide 5/8-inch minimum throw of latch and deadbolt used on pairs of doors. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.

1. Provide 1/2-inch minimum throw on other latch and deadlock bolts.

C. Flush Bolt Heads: Minimum of 1/2-inch diameter rods of brass, bronze, or stainless steel, with minimum of 12-inch long rod for doors up to 7'-0" in height. Provide longer rods as necessary for

doors exceeding 7'-0" in height.

D. Exit Device Dogging: Except on fire-rated doors, wherever closers are provided on doors equipped with exit devices, equip the units with keyed dogging device to hold the push bar down and the latch bolt in the open position.

2.07 PUSH/PULL UNITS

A. Exposed Fasteners: Provide manufacturer's standard exposed fasteners for installation; thru-bolted for matched pairs, but not for single units.

2.08 CLOSERS AND DOOR CONTROL DEVICES

A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size and door control unit, depending upon size of door, exposure to weather, and anticipated frequency of use.

1. Where parallel arms are indicated for closers, provide closer unit one size larger than recommended for use with standard arms.

B. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units complying the ANSI A117.1 provisions for door opening force and delayed action closing.

C. Combination Door Closers and Holders Interconnected to Fire Alarm System:

1. Provide units designed to hold door in open position under normal usage and to release and automatically close door under fire conditions when fire alarm system is activated.

2. Incorporate an integral electromagnetic holder mechanism designed for use with UL listed fire detectors interconnected to fire alarm system, provided with normally closed switching contacts.

a. Provide integral smoke detector devices in combination door closers and holders complying with UL 228. One smoke detector on each side of a single door or group of doors.

D. Flush Floor Plates: Provide finished metal flush floor plates for floor closers except where thresholds are indicated and cover plate is specified to be an integral part of threshold. Finish floor plate to match hardware sets, unless otherwise indicated.

E. Provide grey resilient parts for exposed bumpers.

2.09 DOOR TRIM UNITS

A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units.

B. Fabricate protection plates (armor, kick, or mop) not more than 1-1/2 inch less than door width on stop side and not more than 1/2 inch less than door on pull side x the height indicated.

2.10 WEATHERSTRIPPING

A. General: Except as otherwise indicated, provide continuous weatherstripping at each edge of every exterior door leaf. Provide type, sizes, and profiles shown or scheduled. Provide non-corrosive fasteners as recommended by manufacturer for application indicated.

B. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strip is easily replaceable and readily available from stocks maintained by manufacturer.

C. Weatherstripping at Jambs and Heads: Provide bumper-type resilient insert and metal retainer strips, surface-applied unless shown as mortised or semi-mortised, of following metal, finish, and resilient bumper material:

1. Extruded aluminum with color anodized finish as selected by Architect from manufacturer's standard color range; 0.062-inch minimum thickness of main walls and flanges.

2. Extruded (brass), finish to match door/frames, 0.05-inch minimum thickness of main walls and flanges.

3. Closed-cell extruded, hollow sponge neoprene insert, conforming to MIL R 6130 A Type II, Grade C, with ribbed face of 5/8-inch contact width; designed as a combination door stop and seal.

4. Flexible bulb or loop insert of vinyl, conforming to MIL R 6055, Class II, Grade 40.

D. Weatherstripping at Door Bottoms:

1. Extruded aluminum with color anodized finish as selected by Architect from manufacturer's standard color range; 0.062-inch minimum thickness of main walls and flanges.

2. Extruded brass, finished to match doors; 0.05-inch minimum thickness of main walls and flanges.

3. Flexible vinyl wiper or sweep seal strip complying with CS 230-60.

2.11 THRESHOLDS

A. General: Except as otherwise indicated, provide standard metal threshold unit of type, size, and profile as shown or scheduled.

B. Exterior Hinged/Pivoted Doors: Provide units not less than 4 inches wide, formed to accommodate change in floor elevation where indicated, fabricated to accommodate door hardware and to fit door frames.

2.14 HARDWARE FINISHES

A. Provide matching finishes for hardware units at each door or opening, to the greatest extent possible, and except as otherwise indicated. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of hardware exposed at the same door or opening. In general, match items to the manufacturer's standard finish for the latch and lock set (or push-pull units if no latch-lock sets) for color and texture.

B. Provide finishes which match those established by BHMA or, if none established, match the Architect's sample.

C. Provide qualify of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified for the applicable units of hardware by referenced standards.

D. Provide protective lacquer coating on all exposed hardware finishes of brass, bronze, and aluminum, except as otherwise indicated. The suffix "-NL" is used with standard finish designations to indicate "no lacquer".

E. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI A156.18 "Materials and Finishes Standard", including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.

F. The designations used in schedules and elsewhere to indicate hardware finishes are the industry-recognized standard commercial finishes, except as otherwise noted.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by the Architect.

B. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for custom Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by the Architect.

C. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal,

storage, and reinstallation or application of surface protections with finishing work specified in the Division 9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.

D. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

F. Set thresholds for exterior doors in full bed of butyl rubber or polyisobutylene mastic sealant.

3.02 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace that which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Clean adjacent surfaces soiled by hardware installation.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct Owner's personnel in proper adjustment and maintenance of hardware and hardware finishes during the final adjustment of hardware.

E. Continued Maintenance Service: Approximately six months after the acceptance of hardware in each area, the Installer, accompanied by a representative of the latch and lock manufacturer, shall return to the project and re-adjust every item of hardware to restore to proper function of doors and hardware. Consult with and instruct the Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials, or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.03 FINISH HARDWARE DATA SHEET

A. Manufacturers:

1. Hinges:

a. Ball bearing: Stanley*, Hager.

b. Continuous geared: Roton*, Pemko, Select.

2. Locksets: Schlage*, Yale, Russwin.

3. Closers: Norton*, LCN, Rixson.

4. Exit Device: Von Duprin*, Precision.

5. Saddles: Pemko*, Reese.

6. Push/Pull Units (surface mounted): Von Duprin*, Ives.

7. Recessed Pulls: Special-Lite*, Von Duprin.

8. Kickplates: Ives*, Brookline.

9. Stops and Holders: Ives*, Glynn-Johnson, Rixson.

10. Silencers: Ives*, Glynn-Johnson.

11. Removable Mullions: Von Duprin*.

12. Flush Bolts: Ives*, Hager.

13. Weatherstripping: Pemko*, Reese.

14. Electro-Magnetic Door Holders: Norton*.

B. Finishes:

U.S. Standard	B.H.M.A.	Description
US26	625	Chromium Plated, Polished
US26D	626	Chromium Plated, Dull
US27	627	Natural Aluminum, Clear Lacquered
US28	628	Aluminum, Clear Anodized
A1	---	Bronze Anodized Aluminum
A2	---	Black Anodized Aluminum
US32	629	Stainless Steel, Polished
US32D	630	Stainless Steel, Dull
USP	600	Spray Primed for Painting

3.04 FINISH HARDWARE SCHEDULE

A. Provide finish hardware for each door to comply with requirements of section "Finish Hardware". Hardware set numbers indicated in Door Schedule and the following schedule for hardware sets.

Hardware Set No. 1

2 Closers:	(For aluminum and glass exterior door) Norton, No. PR-CLP-8301-BF-T Finish: US26D
1 Removable Mullion:	Von Duprin, No. 5654 (Aluminum) Finish: US28
2 Exit Devices:	Von Duprin, No. CD98NL-OP (w/No. 299 strike) Finish: US26D
2 Recessed Door Pulls:	Special-Lite, No. SL-82 Finish: US28
2 Continuous Geared Hinges:	Roton, No. 780-112HD Finish: US28
1 Weatherstripping:	Pemko door bottom pile brush 18041CP.
1 Threshold as follows:	Pemko modular ramp threshold for level floor use: 2548A for 3/8" offset use: 200A x 228A for 1/2" offset use: R.50SMRAK for 3/4" offset use: R.75SMRAK over 3/4" offset use: RVARI/AK

Hardware Set No. 2

2 Closers:	Norton, No. PR-CLP-7500-BF-T Finish: US26D
1 Removable Mullion:	1 Von Duprin, No. 4954 (Steel) Finish: Sprayed Aluminum (SP28)
2 Exit Devices:	Von Duprin, No. CD98NL Von Duprin, No. CD98DT (w/ No. 299 strikes) Finish: US26D
2 Continuous Geared Hinges:	Roton, No. 780-112HD Finish: US28
1 Weatherstripping:	Pemko rigid jamb weatherstripping 303AS; door bottom weatherstripping 18041CP.
1 Threshold as follows:	Pemko modular ramp threshold-- for level floor use: 2548A for 3/8" offset use: 200A x 228A

for 1/2” offset use: R.50SMRAK
for 3/4” offset use: R.75SMRAK
over 3/4” offset use: RVARI/AK

Hardware Set No. 3

1 Closer:	(For Specialite door) Norton, No. 7500-BF Finish: US26D
1 Lockset:	Schlage, No. D70PD, Athens Lever. Finish: US26D
1 Continuous Geared Hinge:	Roton, No. 780-112HD Finish: US28
1 Weatherstripping:	Pemko door bottom weatherstripping 18041CP.
1 Threshold as follows:	Pemko modular ramp threshold-- for level floor use: 2548A for 3/8" offset use: 200A x 228A for 1/2" offset use: R.50SMRAK for 3/4" offset use: R.75SMRAK over 3/4" offset use: RVARI/AK

Hardware Set No. 4

2 Closers:	Norton, No. PR-7500-BF Finish: US26D
1 Lockset:	Schlage, No. D70PD, Athens Lever Finish: US26D
1 Dummy trim:	Schlage, No. D170, Athens Lever Finish: US26D
2 Magnetic Holders:	Norton, No. R6935, Finish: Sprayed Aluminum (SP28)
2 Self-Latching Flush Bolts:	Ives, No. 356 w/Strikes (top & bottom of inactive leaf) Finish: US26D
1 Coordinator:	Ives, No. 936-36" Finish: US26D
3 Pair Hinges:	Stanley Ball Bearing, No. FBB191 Finish: US32D
4 Kick Plates:	Ives, No. 8400, 8" x 34" Finish: US28
6 Silencers:	Ives, No. 20 Finish: Gray Rubber

Hardware Set No. 5

2 Closers:	Norton, No. 7500-BF Finish: US26D
1 Lockset:	Schlage, No. D70PD, Athens Lever Finish: US26D
1 Dummy Trim:	Schlage, No. D170, Athens Lever Finish: US26D
2 Magnetic Holders:	Norton, No. R6935, Finish: Sprayed Aluminum (SP28)
2 Self-latching Flush Bolts:	Ives, No. 356 w/Strikes (top & bottom of inactive leaf) Finish: US26D
1 Coordinator:	Ives, No. 936-36” Finish: US26D
3 Pair Hinges:	Stanley Ball Bearing, No. FBB191 Finish: US32D
4 Kick Plates:	Ives, No. 8400, 8” x 34” Finish: US28
6 Silencers:	Ives, No. 20 Finish: Gray Rubber

Hardware Set No. 6

2 Closers:	Norton, No. 7500-BF Finish: US26D
1 Lockset:	Schlage, No. D70PD, Athens Lever Finish: US26D
1 Dummy trim:	Schlage, No. D170, Athens Lever Finish: US26D
3 Pair Hinges:	Stanley Ball Bearing, No. FBB191 Finish: US32D
2 Flush Bolts:	Ives, No. 358 w/Strikes (top & bottom of inactive leaf) Finish: US26D
4 Kick Plates:	Ives, No. 8400, 8” x 34” Finish: US28
6 Silencers:	Ives, No. 20 Finish: Gray Rubber
2 Floor Stops:	Ives, No. 436

Finish: US26D

Hardware Set No. 7

2 Closers:	Norton, No. PR7500-BF Finish: US26D
2 Exit Devices:	Von Duprin, No. 9947L, (w/ No. 385A & 338 strikes) Finish: US26D
2 Magnetic Holders:	Norton, No. R6935, Finish: Sprayed Aluminum (SP28)
2 Continuous Geared Hinges:	Roton, No. 780-224HD Finish: US28
4 Kick Plates:	Ives, No. 8400, 8” x 34” Finish: US28
6 Silencers:	Ives, No. 20 Finish: Gray Rubber

Hardware Set No. 8

2 Closers:	Norton, No. PR7500-BF Finish: US26D
2 Exit Devices:	Von Duprin, No. 9827L-F (w/ No. 304L & 338 strikes) Finish: US26D
4 Kick Plates:	Ives, No. 8400, 8” x 34” Finish: US28
2 Magnetic Holders:	Norton, No. R6935, Finish: Sprayed Aluminum (SP28)
2 Continuous Geared Hinges:	Roton, No. 780-112HD Finish: US28

Hardware Set No. 9

1 Lockset:	Schlage, No. D70PD, Athens Lever Finish: US26D
2 Flush Bolts:	Ives, No. 358 w/Strikes (top & bottom of inactive leaf) Finish: US26D
2 Kick Plates:	Ives, No. 8400, 8" x 34" Finish: US28
6 Silencers:	Ives, No. 20 Finish: Gray Rubber
3 Pair Hinges:	Stanley Ball Bearing, No. FBB191 Finish: US32D
2 Door Stops/Holders:	Ives, No. 495 (Stop/Holder & Wall strike) Finish: US26D

Hardware Set No. 10

1 Closer:	Norton, No. 7500-BF Finish: US26D
1 Lockset:	Schlage, No. D70PD, Athens Lever Finish: US26D
1-1/2 Pair Hinges:	Stanley Ball Bearing, No. FBB191 Finish: US32D
2 Kick Plates:	Ives, No. 8400, 8" x 34" Finish: US28
3 Silencers:	Ives, No. 20 Finish: Gray Rubber
1 Floor Stop:	Ives, No. 436 Finish: US26D
1 Saddle:	4" Marble w/ Bevel for A.D.A Compliance, color to be selected by this Architect

Hardware Set No. 11

1-1/2 Pair Hinges:	Stanley Ball Bearing, No. FBB179 Finish: US26D
1 Lockset:	Schlage, No. D80PD, Athens Lever Finish: US26D
2 Kick Plates:	Ives, No. 8400, 8” x 34” Finish: US28
1 Door Stop/Holder:	Ives, No. 495 (Stop/Holder & Wall strike) Finish: US26D
3 Silencers:	Ives, No. 20 Finish: Gray Rubber

Hardware Set No. 12

1 Closer:	Norton, No. PR-CLP-7500-BF-T Finish: US26D
1 Lockset:	Schlage, No. D80PD, Athens Lever Finish: US26D
1-1/2 Pair Hinges:	Stanley Ball Bearing, No. FBB191 Finish: US32D
2 Kick Plates:	Ives, No. 8400, 8” x 34” Finish: US28
3 Silencers:	Ives, No. 20 Finish: Gray Rubber

Hardware Set No. 13

1 Closer:	Norton, No. PR-CLP-7500-BF-T Finish: US26D
1 Exit Device:	Von Duprin, No. CD98NL-OP (w/No. 299 strike) Finish: US26D
1 Continuous Geared Hinge:	Roton, No. 780-224HD Finish: US28
1 Weatherstripping:	Pemko rigid jamb weatherstripping 303AS. Door bottom weatherstripping: 18041CP.
1 Threshold as follows:	Pemko modular ramp threshold for level floor use: 2548A

for 3/8” offset use: 200A x 228A
for 1/2” offset use: R.50SMRAK
for 3/4” offset use: R.75SMRAK
over 3/4” offset use: RVARI/AK

Hardware Set No. 14

1 Closer:	Norton, No. 7500-BF Finish: US26D
1 Lockset:	Schlage, No. D70PD, Athens Lever Finish: US26D
1-1/2 Pair Hinges:	Stanley Ball Bearing, No. FBB191 Finish: US32D
1 Saddle:	Pemko Saddle Threshold, No. 272A w/ No. 183A elevator piece
2 Kick Plates:	Ives, No. 8400, 8” x 34” Finish: US28
3 Silencers:	Ives, No. 20 Finish: Gray Rubber
1 Floor Stop:	Ives, No. 436 Finish: US26D

Hardware Set No. 15

1 Sliding Hardware:	L.E. Johnson, No. 138FW w/ Nylon Posts & Flush Pulls Finish: US28

Hardware Set No. 16

1 Closer:	Norton, No. 7500-BF Finish: US26D
1 Lockset:	Schlage, No. D70PD, Athens Lever Finish: US26D
1-1/2 Pair Hinges:	Stanley Ball Bearing, No. FBB191 Finish: US32D
2 Kick Plates:	Ives, No. 8400, 8” x 34” Finish: US28
3 Silencers:	Ives, No. 20 Finish: Gray Rubber
1 Floor Stop:	Ives, No. 436 Finish: US26D

Hardware Set No. 17

1 Lockset:	Schlage, No. D10S, Athens Lever Finish: US26D
1-1/2 Pair Hinges:	Stanley Ball Bearing, No. FBB191 Finish: US32D
2 Kick Plates:	Ives, No. 8400, 8” x 34” Finish: US28
3 Silencers:	Ives, No. 20 Finish: Gray Rubber
1 Floor Stop:	Ives, No. 436 Finish: US26D

Hardware Set No. 18

1-1/2 Pair Hinges:	Stanley Ball Bearing, No. FBB191 Finish: US32D
1 Lockset:	Schlage, No. D80PD, Athens Lever Finish: US26D
2 Kick Plates:	Ives, No. 8400, 8” x 34” Finish: US28
1 Door Stop/Holder:	Ives, No. 495 (Stop/Holder & Wall strike) Finish: US26D
3 Silencers:	Ives, No. 20 Finish: Gray Rubber
1 Saddle:	Pemko Saddle Threshold, No. 272A w/ No. 183A elevator piece

Hardware Set No. 19

1 Closer:	Norton, No. PR 7500-BF Finish: US26D
1 Exit Device:	Von Duprin, No. 9827L-F (w/No. 304L & 338 strikes) Finish: US26D
2 Kick Plates:	Ives, No. 8400, 8” x 34” Finish: US28
1 Magnetic Holder:	Norton, No. R6935, Finish: Sprayed Aluminum (SP28)
1 Continuous Geared	

Hinge:	Roton, No. 780-112HD Finish: US28

Hardware Set No. 20

1 Closer:	Norton, No. 7500-BF Finish: US26D
1-1/2 Pair Hinges:	Stanley Ball Bearing, No. FBB191 Finish: US32D
1 Lockset:	Schlage, No. D80PD, Athens Lever Finish: US26D
2 Kick Plates:	Ives, No. 8400, 8” x 34” Finish: US28
1 Floor Stop:	Ives, No. 436 Finish: US26D
3 Silencers:	Ives, No. 20 Finish: Gray Rubber

Hardware Set No. 21

1 Closer:	Norton, No. 7500-BF-H Finish: US26D
1 Lockset:	Schlage, No. D70PD, Athens Lever Finish: US26D
1-1/2 Pair Hinges:	Stanley Ball Bearing, No. FBB191 Finish: US32D
2 Kick Plates:	Ives, No. 8400, 8” x 34” Finish: US28
3 Silencers:	Ives, No. 20 Finish: Gray Rubber
1 Floor Stop:	Ives, No. 436 Finish: US26D

Hardware Set No. 22

1 Closer:	Norton, No. 7500-BF Finish: US26D
1 Lockset:	Schlage, No. D80PD, Athens Lever Finish: US26D
1-1/2 Pair Hinges:	Stanley Ball Bearing, No. FBB191 Finish: US32D
1 Saddle:	Pemko Saddle Threshold, No. 272A w/ No. 183A elevator piece
2 Kick Plates:	Ives, No. 8400, 8" x 34" Finish: US28
3 Silencers:	Ives, No. 20 Finish: Gray Rubber
1 Floor Stop:	Ives, No. 436 Finish: US26D

Hardware Set No. 23

1 Closer:	Norton, No. PR 7500-BF-H Finish: US26D
1 Exit Device:	Von Duprin, No. 98EO (w/ No. 299 strike) Finish: US26D
1 Continuous Geared Hinge:	Roton, No. 780-224HD Finish: US28
1 Weatherstripping:	Pemko rigid jamb weatherstripping 303AS; door bottom weatherstripping 18041CP.
1 Threshold as follows:	Pemko modular ramp threshold for level floor use: 2548A for 3/8" offset use: 200A x 228A for 1/2" offset use: R.50SMRAK for 3/4" offset use: R.75SMRAK over 3/4" offset use: RVARI/AK

Hardware Set No. 24

1-1/2 Pair Hinges:	Stanley Ball Bearing, No. FBB191 Finish: US32D
1 Lockset:	Schlage, No. D70PD, Athens Lever Finish: US26D
2 Kick Plates:	Ives, No. 8400, 8" x 34" Finish: US28
1 Door Stop/Holder:	Ives, No. 495 (Stop/Holder & Wall strike) Finish: US26D
3 Silencers:	Ives, No. 20 Finish: Gray Rubber
1 Saddle:	Pemko Saddle Threshold, No. 272A w/No. 183A elevator piece

END OF SECTION

DIVISION 8 - DOORS AND WINDOWS

SECTION 08800 - GLASS AND GLAZING

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Furnish and install glass and glazing work as shown on the drawings and as specified herein.

1. Sheet Glazing:

a. Annealed (float) glass.
b. Annealed laminated safety glass.
c. Tempered laminated safety glass.
d. Tempered (heat treated) glass.
e. Insulated glass.
f. Insulated reflective glass.
g. Insulated spandrel glass.
h. Skylight insulated glass.
i. Security glazing.
j. Polycarbonate glazing.

B. The required applications of glass and glazing include (but are not necessarily limited to) the following:

1. Window units (fixed and operable sash).
2. Aluminum, steel, FRP, and wood doors (door lights, sidelights, and transoms).
3. Interior (borrowed light) windows.
4. Storefront and curtainwall framing systems.
5. Skylights.
6. Ballistic framing systems.

C. Related Documents:

1. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

D. Related Sections include the following:

1. Division 7 Section *"Joint Sealants"*.
2. Division 7 Section *"Building Insulation"*
3. Division 8 Section *"Steel Doors and Frames"*.
4. Division 8 Section *"Aluminum Doors and Frames"*.
5. Division 8 Section *"FRP Doors and Frames"*.
6. Division 8 Section *"Flush Wood Doors"*.
7. Division 8 Section *"Aluminum Entrances & Storefronts"*.
8. Division 8 Section *"Aluminum Windows"*.
9. Division 8 Section *"Vinyl Clad Wood Windows"*.
10. Division 8 Section *"Vinyl Clad Wood Doors"*.
11. Division 8 Section *"Glazed Aluminum Curtain Walls"*

E. Insulated metal panels glazed into exterior aluminum window frames are specified in Section 08520, Aluminum Windows.

1.02 REFERENCE STANDARDS:

A. American Architectural Manufacturers Association:

1. AAMA 800 - Voluntary Specifications and Test Methods for Sealants.

B. Federal Regulations:

1. 16FR 1201 – Safety Standards for Architectural Glazing Materials.

C. American Society for Testing and Materials (ASTM):

1. ASTM C 509 - Specification for Elastomeric Cellular Preformed Gasket and Sealing Material.

2. ASTM C 864 - Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.

3. ASTM C 920 - Specification for Elastomeric Joint Sealants.

4. ASTM C 1036 - Specification for Flat Glass.

5. ASTM C 1048 - Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.

6. ASTM C 1087 - Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems.

7. ASTM C 1115 - Specification for Dense Elastomeric Silicone Rubber Gaskets and Accessories.

8. ASTM C 1172 - Specification for Laminated Architectural Flat Glass.

9. ASTM C 1281 - Specification for Preformed Tape Sealants for Glazing Applications.

10. ASTM C 1330 - Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

11. ASTM C 1376 - Specification for Pyrolytic and Vacuum Deposition Coatings on Glass.

12. ASTM E 774 - Specification for the Classification of the Durability of Sealed Insulating Glass Units.

13. ASTM E 1300 - Practice for Determining Load Resistance of Glass in Buildings.

14. ASTM E 2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.

15. ASTM C1036 – Flat Glass.

16. ASTM E838 – Cracking, Blistering, Crazing and Color Change.

17. ASTM E119 – Standard Test Methods for Fire Tests of Building Construction & Materials.

D. Glass Association of North America (GANA):

1. Glazing Manual.

2. Laminated Glass Design Guide.

3. Engineering Standards Manual.

E. The Insulating Glass Manufacturers Alliance (IGMA):

1. IGMA TB-3001 - Sloped Glazing Guidelines.

2. IGMA TM-3000 - Glazing Guidelines for Sealed Insulating Glass Units.

F. Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; Building Technologies Department; Windows & Daylighting Group, windows.lbl.gov/software:

1. "LBNL Window 5.0 (or higher) - A PC Program for Analyzing Window Thermal and Optical Performance.

G. National Fenestration Rating Council (NFRC):

1. NFRC 100 - Procedure for Determining Fenestration Product Thermal Properties.

2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficients at Normal Incidence.

3. NFRC 300 - Procedures for Determining Solar Optical Properties of Simple Fenestration Products.

H. National Fire Protection Association (NFPA):

1. NFPA 80 - Fire Doors and Windows.

2. NFPA 252 - Fire Tests of Door Assemblies.

3. NFPA 257 - Fire Test for Window and Glass Block Assemblies.

I. Safety Glazing Certifications Council (SGCC):

1. SGCC – Certified Products Directory for Safety Glazing Material Used in Buildings.

J. Associated Laboratories, Inc. (ALI):

1. ALI – Certified Products Directory – Fenestration Products.

K. National Association of Architectural Metal Manufacturers (NAAMM):

1. NAAMM SS-1B-68 – Non-Skinning Resilient Preformed Compounds – Tapes, Ribbons, Beads with Release Paper.

L. Federal Specifications (FS):

1. FS TT-S-230A – Sealing Compound, Synthetic Rubber Base, Single Component, Chemically Curing for Caulking, Sealing and Glazing in Building Construction.

2. FS TT-S-002303 – Sealing Compound, Elastomeric Type, Single Component (for Caulking, Sealing, and Glazing in Buildings and Other Structures).

1.03 SUBMISSIONS:

A. Submissions shall be in accordance with Section 01300 – "Submissions" and as modified below.

B. Product Data - Glazing Materials:

1. Submit manufacturer's product data, specifications, and installation instructions for each type glass, glazing material and associated/ related products. Include test data substantiating that glass complies with specified requirements. Include documentation of compatibility of sealants with glazing products, and instructions for handling, storing, installation and recommended procedures for cleaning of each type of glass and glazing material.

C. Samples: Prior to the delivery of materials, submit to the Architect samples of each of the following:

1. Submit three (3) 12" square samples of each type of glass required. Architect's review of samples will be for color, texture, and pattern only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

2. Submit three (3) beads, approximately ¼-inch wide by 3 inches long, of each sealant to be employed, indicating color of set or cured material.

D. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.

E. Shop Drawings: Prior to placement of glass order or glass fabrication, the Contractor shall submit six (6) copies of pertinent shop drawings (i.e. – windows, doors, borrowed light frames, etc.) which have been:

1. Checked and approved by the General Contractor, stamped and dated.

2. Reviewed by the Architect, with stamp affixed.

1.04 DEFINITIONS:

A. Glass: Includes both primary and fabricated glass products as described in FGMA *"Glazing Manual".*

B. Glazing: Include glass installation and materials used to install glass.

C. Sealed Insulating Glass Unit Surfaces:

1. Surface 1: Exterior surface of outer lite.
2. Surface 2: Interspace-facing surface of outer lite.
3. Surface 3: Interspace-facing surface of inner lite.
4. Surface 4: Interior surface of inner lite.

D. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.

E. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

F. Manufacturing defects are defined as edge separation, seal failure, delamination, core cracking, loss of visibility/clarity due dusting or misting, or UV exposure, or chemical reaction to glass cleaners.

1.05 QUALITY ASSURANCE:

A. Manufacturer Qualifications: Company specializing in the manufacture of glass products, types as specified, with minimum documented five years experience.

B. Glazer's Qualifications: Company specializing in the installation of glass products, similar types as specified, with minimum documented five years experience.

C. Single Source Responsibility: Obtain materials from one source for each type of glass and glazing.

D. Preconstruction Adhesion and Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing indicated below, samples of each glass type, tape sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants.

1. Use manufacturer's standard test methods to determine whether priming and other specific preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing

channel substrates.

a. Perform tests under normal environmental conditions replicating those that will exist during installation.

2. Submit not fewer than nine pieces of each type and finish of glass-framing members and each type, class, kind, condition, and form of glass (monolithic, laminated, and insulating units) as well as one sample of each glazing accessory (gaskets, tape sealants, setting blocks, and spacers).

3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.

4. For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.

5. Testing will not be required if elastomeric glazing sealant manufacturers submit data based on previous testing of current sealant products for adhesion to, and compatibility with, glazing materials matching those submitted.

E. Glazing for Fire-Rated Door and Window Assemblies: Glazing tested per NFPA 252 and NFPA 257, as applicable, for assemblies complying with NFPA 80 and listed and labeled per requirements of authorities having jurisdiction.

F. Glazing Industry Publications: Comply with glass product manufacturers' recommendations and the follow: Glazing tested per NFPA 252 and NFPA 257, as applicable, for assemblies complying with NFPA 80 and listed and labeled per requirements of authorities having jurisdiction.

1. GANA Publications: GANA Laminated Division's 'Laminated Glass Design Guide' and GANA's 'Glazing Manual.'
2. IGMA Publication for Insulating Glass: IGMA TM-3000, 'Glazing Guidelines for Sealed Insulating Glass Units.'

1.06 REGULATORY REQUIREMENTS:

A. Comply with applicable provisions of all codes and standards acceptable to local, state and federal agencies having jurisdiction.

B. Perform Work in accordance with the following Glazing Standards:

1. Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual".

2. Safety Glazing: Comply with size, glazing type, location, and testing requirements of 16 CFR 1201 for Category I and

II glazing products, and requirements of authorities having jurisdiction.

3. Insulating Glass: Provide insulating glass units permanently marked either on spacers or on at least one pane with appropriate certification label of Insulating Glass Certification Council (IGCC) or Associated Laboratories, Inc. (ALI).

1.07 PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Glass Design: Glass thicknesses indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:

1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:

a. Specified Design Wind Loads: Provide glazing capable of withstanding wind-load design pressures calculated according to requirements of the 2015 International Building Code or the American Society of Civil Engineers' ASCE 7, "Minimum Design Loads for Buildings and Other Structures," 6.4.2, "Analytical Procedure," whichever are more stringent. Refer to drawings for Wind Design Data.

b. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set within 15 degrees of vertical and under wind load for a load duration of 60 seconds.

c. Probability of Breakage for Sloped Glazing: 1 lite per 1000 for lites set more than 15 degrees off vertical and under wind and snow loads for a duration of 30 days.

d. Minimum Glass Thickness for Exterior Lites: Not less than 6 mm.

C. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in

ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:

1. Center-of-Glass U-Values: NFRC 100 methodology using LBL Window 5.0 analysis, expressed as Btu/ sq. ft. x h x deg F.

2. Center-of-Glass Solar Heat Gain Coefficient: NFRC 200

3. Solar Optical Properties: NFRC 300.

1.08 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Delivery:

1. Deliver glass with manufacturer’s labels intact.

2. Deliver glazing components and sealants in manufacturer’s unopened, labeled containers.

B. Storage and Handling:

1. Store glass in designated areas, away from traffics and construction.

2. Do not remove labels until glass has been installed.

3. Keep glass free from contamination by materials capable of staining or damaging glass.

1.09 ENVIRONMENTAL REQUIREMENTS:

A. Perform glazing only when ambient temperature is above 40 degrees

B. When circumstances require glazing below 45 degrees F, steps shall be taken to assure dry and frost-free surfaces, as approved by the Architect.

1.10 WARRANTY:

A. Provide manufacturer's written warranty for a period of not less than five years, under provisions of Division 1.

B. Warranty: Provide a published and written warranty signed by manufacturer agreeing to furnish F.O.B. point of manufacture,

freight allowed to project site, within 45 working days after receipt of notice from Owner for replacement of those units which develop manufacturing defects.

C. Manufacturer's Special Warranty on Laminated Glass: Written warranty, made out to Owner and signed by laminated-glass manufacturer agreeing to furnish replacements for laminated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

Subject to compliance with requirements, provide products by one of the following:

A. Glass Products:

1. Manufacturers producing glass complying with the requirements include the following:

a. Vitro Architectural Glass, Cheswick, PA, 1-855-887-6457, Email:archservices@vitro.com, http://www.vitroglazings.com

b. Libbey-Owens-Ford Co. (LOF), Toledo, OH.

c. Hordis Brothers, Inc., Pennsauken, NJ.

d. AFG Industries, Inc., Kingsport, TN.

e. Guardian Industries Corp., Carleton, MI.

f. Custom Glass Co., Kittanning, PA.

B. Polycarbonate Glazing Products:

1. Manufacturers producing glass complying with the requirements include, but are not necessarily limited to, the following:

a. General Electric Co., GE Plastics Structured Products, Pittsfield, MA 01201, www.structuredproducts.ge.com (800) 451-3147.
b. Cadillac Plastic and Chemical Company.
c. Commercial Plastic and Supply Company.
d. Insulgard Corporation.

2.02 MATERIALS

A. General:

1. Of domestic manufacture – Federal Spec. DD-G-451c. Thickness tolerances shall conform to published standards of approved manufacturer.

2. All glass, whether specifically shown or specified, shall conform to manufacturer's standards as to maximum size for each type of glass.

3. If a speak hole is required, provide Nissen #425 S/S Speak Hole or equal as approved by the Architect.

2.03 PROCESSED GLASS PRODUCTS:

A. **One-quarter inch (1/4″) Annealed Float Glass:**

1. General:

a. Float glass is glass which has been floated on molten tin and annealed slowly to produce a transparent flat glass which eliminates grinding or polishing.

b. ASTM C 1036, Type I, Quality-Q3, class 1.

c. CPSC 16 CFR 1201, safety regulation for architectural glazing in hazardous locations; 1/4-inch thick.

B. **One-quarter inch (1/4″) Heat-Treated Safety Glass:**

1. General:

a. ASTM C1048, Kind FT (fully tempered), Condition A (uncoated), Type I (transparent flat), Class 1 (clear), Quality q3 (glazing select).

b. ANSI Z97.1 and CPSC 16CFR-1201, safety regulation for architectural glazing in hazardous locations; 1/4-inch thick.

C. **Laminated Safety Glass:**

1. Laminating Process: Fabricate laminated glass to produce glass free of foreign substances and air or glass pockets as follows:

a. ASTM C1172, Laminate lites with polyvinyl butyral interlayer in autoclave with heat plus pressure.

2. **One-quarter inch (1/4″) Safety Laminated, Polished Plate Glass:**

a. A 0.015″ thick plastic (interlayer) film sandwiched between two layers of 1/8″ annealed float glass.

b. CPSC 16CFR-1201, safety regulation for architectural glazing in hazardous locations; 1/4-inch thick. Comply with ASTM C 1172 for kinds of laminated glass indicated and other requirements specified.

c. Interlayer: Interlayer material as indicated below, clear or in colors, and of thickness indicated with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation.

1. Interlayer Material: Polyvinyl butyral sheets or cured resin.

3. **One-half inch (1/2″) Tempered Laminated Safety Glass:**

a. Formed of two pieces of ASTM C1048, Kind FT (fully tempered), Condition A (uncoated), Type I (transparent), Class 1 (tinted grey), Quality q3 (glazing select), glass 1/4-inch thick laminated together with a clear 0.015 inch thick PVB interlayer, for a 1/2-inch total nominal thickness.

b. CPSC 16CFR-1201, safety regulation for architectural glazing in hazardous locations.

D. **One-quarter inch (1/4″) Tempered Glass:**

1. General:

a. Float glass which has been heat treated and rapidly cooled to produce compressively stressed surface layer resulting in a strength of at least four to five times that of annealed glass and complying with strength requirements of FS-DD-G-1403B for Grade B, Tempered Glass.

b. CPSC 16CFR-1201, safety regulation for architectural glazing in hazardous locations; when used in a dual glazed unit 1/4″ thick.

E. **One Inch (1″) Insulated Glass**:

1. General:

   a. Factory-assembled units consisting of dual-sealed lites of glass separated by a dehydrated interspace, with manufacturer's standard spacer material and construction, per ASTM E 2190.

   b. All insulating glass units, whether specifically shown or specified, shall conform to the manufacturer's standards as to maximum size for each type of glass.

   c. Fabricate glazing units in dimensions required, with edge and face clearances, edge and surface conditions, and bite in accordance with glazing product manufacturer/fabricator's instructions and referenced glazing publications.

2. **High Performance Insulating Glass**: Formed of two 1/4-inch lites of glass separated by a 1/2-inch Argon Gas filled space hermetically sealed, for a total 1 inch nominal thickness, consisting of:

   a. Outer Lite: ASTM C1036, Type I, Class 1 (tint - color as selected by architect), Quality q3.

      1. Kind FT (Full Tempered)
      2. 1/4-inch thick glass.
      3. Magnetic Sputter Vacuum Deposition Coating (MSVD): ASTM C 1376.
      4. Coating: "Solarban" 70 Solar Control Low-E (Sputtered) by Vitro Architectural Glass on the second surface (2).

   b. Inside Lite: ASTM C1036, Type I, Class 1 (clear), Quality q3.

      1. Kind FT (Full Tempered)
      2. 1/4-inch thick glass.

   c. Performance Requirements: (minimum requirements based on non-tinted clear glass)

      1. Visible Light Transmittance: 64 percent minimum.
      2. Winter Nighttime U-Factor: 0.24 ($Btu/hr*ft^2*°F$) maximum.
      3. Summer daytime U-Factor: 0.21 ($Btu/hr*ft^2*°F$) maximum.
      4. Shading Coefficient: 0.31 maximum.
      5. Solar Heat Gain Coefficient: 0.27 maximum.
      6. Outdoor Visible Light Reflectance: 13 percent maximum.

3. **High Performance Reflective Insulating Glass**: Formed of two 1/4-inch lites of glass separated by a 1/2-inch Argon Gas filled space hermetically sealed, for a total 1 inch nominal thickness, consisting of:

   a. Outer Lite: ASTM C1036, Type I, Class 1 (tint - color as selected by architect), Quality q3.

      1. Kind FT (Full Tempered)
      2. 1/4-inch thick glass.
      3. Coating: "Solarcool" by Vitro Architectural Glass on first surface (1).
      4. Pyrolytic coating on the second surface (2)

   b. Inside Lite: ASTM C1036, Type I, Class 1 (clear), Quality q3.

      1. Kind FT (Full Tempered)
      2. 1/4-inch thick glass.
      3. Magnetic Sputter Vacuum Deposition Coating (MSVD): ASTM C 1376
      4. Coating: "Solarban" 60 Solar Control Low-E (Sputtered) by Vitro Architectural Glass on the third surface (3).

   c. Performance Requirements: (minimum requirements based on Solarbronze glass)

      1. Visible Light Transmittance: 16 percent minimum.
      2. Winter Nighttime U-Factor: 0.24 ($Btu/hr*ft^2*°F$) maximum.
      3. Summer daytime U-Factor: 0.22 ($Btu/hr*ft^2*°F$) maximum.
      4. Shading Coefficient: 0.18 maximum.
      5. Solar Heat Gain Coefficient: 0.16 maximum.
      6. Outdoor Visible Light Reflectance: 37 percent maximum.

4. **High Performance Spandrel Insulating Glass**: Formed of two 1/4-inch lites of glass separated by a 1/2-inch Argon Gas filled space hermetically sealed, for a total 1 inch nominal thickness, consisting of:

   a. Outer Lite: ASTM C1036, Type I, Class 1 (tint - color as selected by architect), Quality q3.

      1. Kind FT (Full Tempered)
      2. 1/4-inch thick glass.
      3. Magnetic Sputter Vacuum Deposition Coating (MSVD): ASTM C 1376.
      4. Coating: "Solarban" 70 Solar Control Low-E (Sputtered) by Vitro Architectural Glass on the second surface (2).

b. Inside Lite: ASTM C1036, Type I, Class 1 (clear), Quality q3.

1. Kind FT (Full Tempered)
2. 1/4-inch thick glass.
3. Monolithic coating on the fourth surface (4)
4. Coating: "OPACI-COAT 300" by ICD High Performance Coatings, 7350 South Union Ridge Parkway, Ridgefield WA 98642. 360.546.2286 phone - 360.546.2287 fax; ***icd@icdcoatings.com;*** http://www.icdcoatings.com/

c. Performance Requirements: (minimum requirements based on non-tinted clear glass)

1. Visible Light Transmittance: 64 percent minimum.
2. Winter Nighttime U-Factor: 0.24 ($Btu/hr*ft^2*°F$) maximum.
3. Summer daytime U-Factor: 0.21 ($Btu/hr*ft^2*°F$) maximum.
4. Shading Coefficient: 0.31 maximum.
5. Solar Heat Gain Coefficient: 0.27 maximum.
6. Outdoor Visible Light Reflectance: 13 percent maximum.

5. **High Performance Insulating Skylight Glass**: (to be used at all glass skylights and horizontal glass applications) Formed of one 1/4-inch lite of tempered glass and one 5/16-inch inch lite of laminated glass separated by a 1/2-inch Argon Gas filled space hermetically sealed, for a total 1-3/16 inch nominal thickness, consisting of:

a. Outer Lite: ASTM C1036, Type I, Class 1 (tint - color as selected by architect), Quality q3.

1. Kind FT (Full Tempered)
2. 1/4-inch thick glass.
3. Magnetic Sputter Vacuum Deposition Coating (MSVD): ASTM C 1376.
4. Coating: "Solarban" 70 Solar Control Low-E (Sputtered) by Vitro Architectural Glass on the second surface (2).

b. Indoor Lite: Laminate: ASTM C1172 and complying with testing requirements.

I. Laminate Outboard Lite: ASTM C1036, Type I (transparent), Class 1 (clear), Quality q3.

1. Kind FT (Full Tempered)
2. 1/4-inch thick glass.

II. Interlayer: ASTM C1036, Type I, Class 1 (tint - color as selected by architect), Quality q3.

1. Type: PVB
2. Thickness: 0.015” (0.38mm)”
3. Color: White

III. Laminate Inboard Lite: ASTM C1036, Type I (transparent), Class 1 (clear), Quality q3.

1. Kind FT (Full Tempered)
2. 1/4-inch thick glass.

c. Performance Requirements: (minimum requirements based on non-tinted clear glass)

1. Visible Light Transmittance: 58 percent minimum.
2. Winter Nighttime U-Factor: 0.22 (Btu/hr*ft^2*°F) maximum.
3. Summer daytime U-Factor: 0.14 (Btu/hr*ft^2*°F) maximum.
4. Shading Coefficient: 0.30 maximum.
5. Solar Heat Gain Coefficient: 0.26 maximum.
6. Outdoor Visible Light Reflectance: 13 percent maximum.

6. **Security Glazing:**

a. 5/16” thick Laminated Shooter/Attack Certified Security Glass

1. AOTSG516L Security Glass, as manufactured by Armoured One, or approved equal.

b. One Inch (1”) Insulated Shooter/Attack Certified Tactical Security Glass

1. AOTSG1 Security Glass, as manufactured by Armoured One, or approved equal

2.05 GLAZING MATERIALS AND ACCESSORIES:

A. General:

1. Provide black exposed glazing materials, unless another color is indicated, or unless another color is selected by the Architect from manufacturer's standard colors. Provide hardness of materials as recommended for the required application and condition of installation in each case. Provide only compounds, which are known (proven) to be fully compatible with surface contacted.

B. Glazing Sealants:

1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.

3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range for this characteristic.

4. For Glazing Interior Openings:

   a. Acrylic latex one-part terpolymer (FS TT-00230) or acrylic latex emulsion (ASTM C-834), compounded specifically as glazing sealant with permanent flexibility (non-hardening), non-staining, and non-bleeding.

   b. Products complying with these requirements include:

      1. "AC-20" by Pecora Corp., Harleysville, Pennsylvania.

      2. "MONO" by Tremco, Inc., Cleveland, Ohio.

      3. "Krylflex" by Chem-Masters Corp., Chagrin Falls, Ohio.

5. For Glazing Exterior Openings, except where gasket is used:

   a. Silicone sealant, complying with FS TT-S-001543, Class A, non-sag, compounded for glazing applications.
   b. Products complying with these requirements include:

      1. "Dow Corning 999 Silicone Building and Glazing Sealant" by Dow Corning Corp., Midland, Michigan.

      2. "Silicone Construction Sealant 1200" by General Electric Co., Silicone Products Div., Waterford, New York.

6. For Glazing Glass to Glass:

   a. Structural Silicone sealant, complying with ASTM

C1401-09a, Standard Guide for Structural Sealant Glazing.

b. Products complying with these requirements include:

1. "Dow Corning 993 Structural Glazing Silicone Sealant" by Dow Corning Corp., Midland, Michigan.

2. "Dow Corning 3362 Insulating Glass Silicone Sealant" by Dow Corning Corp., Midland, Michigan.

C. Glazing Tape: Preformed macro polyisobutylene; NAAMM #55-1B-68, with integral spacing device, paper release; "Polyskim Tape", color as later selected by Architect.

D. Setting Blocks: Neoprene, Shore A durometer hardness of 85,plus or minus 5, 4 inches long by 3/8-inch thick by 1/4-inch high.

E. Glazing Gaskets:

1. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:

a. Neoprene, ASTM C 864.
b. EPDM, ASTM C 864.
c. Silicone, ASTM C 1115.
d. Thermoplastic polyolefin rubber, ASTM C 1115.
e. Any material indicated above.

2. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned gaskets of material indicated below; complying with ASTM C 509, Type II, black; and of profile and hardness required to maintain watertight seal:

1. Neoprene(not compatible with silicone glazing sealants)
2. EPDM.
3. Silicone.
4. Thermoplastic polyolefin rubber.
5. Any material indicated above.

F. Primers, Sealers & Cleaners: Recommended by sealant manufacturer.

G. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

H. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

I. Compressible Filler Rod:

1. Closed cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, proven to be compatible with sealants used, flexible and resilient, with 5-10 psi compression strength for 25% deflection.

PART 3 - EXECUTION

3.01 INSPECTION

A. Check that glazing channels are free of burrs, irregularities, and debris.

B. Do not proceed with installation until any unsatisfactory conditions are corrected and placed in satisfactory condition.

3.02 PREPARATION

A. Field Measurements:

1. Cut glass accurately to sizes obtained from actual verified field measurements of frames to receive glass.

2. Allow for proper edge clearances.

B. Preparation of Surfaces:

1. Remove any protective coatings or covering from surfaces to be glazed.

2. Clean glass and glazing surfaces to remove dust, oil and contaminants, and wipe dry.

3. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.03 DELIVERY AND STORAGE:

A. Delivered materials shall match the approved samples. Packaged materials shall be delivered in the original unopened labeled containers of the manufacturer, clearly marked with their name and brand.

B. Each panel of glass shall be factory labeled. Store glass, while awaiting installation, in a dry, well-ventilated location at a constant temperature maintained above dew point.

C. Glass that is cracked, broken, chipped, or otherwise damaged during transportation, storage, and erection (including natural causes, accidents, and vandalism) and unfit for use shall be removed from the job site and replaced with acceptable materials at the Contractor’s expense.

3.04 GENERAL PROVISIONS:

A. Exterior Glazing Only:

1. Watertight and airtight installation of each piece of glass is required, except as otherwise shown. Each installation must withstand normal temperature changes, wind loading, impact loading (for operating sash and doors) without failure of any kind including loss of breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the work.

2. Weather conditions:

a. Do not proceed with installation of liquid sealants under adverse weather conditions, or when temperatures are below or above manufacturer’s recommended limitations for installation.

B. Interior and Exterior glazing:

1. Protect glass from edge damage at all times during handling, installation, and operation of the building.

2. Glazing channel dimensions as shown are intended to provide for necessary minimum bite on the glass, minimum edge clearance and adequate sealant thickness, with reasonable tolerances. The installer is responsible for correct glass size for each opening, within the tolerances and necessary dimensions established.

3. The installer must examine the framing or glazing channel surfaces, backing, stop design, and the conditions under which the glazing is to be performed, and notify the Prime Contractor in writing of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the glazing until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

3.05 INSTALLATION:

A. Verify by measurements at the job site all dimensions affecting this work.

B. Comply with combined recommendations of glass manufacturer and manufacturer of sealants, gaskets, and other materials used in glazing, except where more stringent requirements are shown or specified, and except where manufacturers' technical representatives direct otherwise.

C. Install polysulfide sealants as recommended by Thiokol Chemical Corp., except as otherwise recommended by the sealant manufacturer.

D. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation. Clean the glazing channel, or other framing members to receive glass, immediately before glazing. Remove coating which are not firmly bonded to the substrate. Remove lacquer from metal surfaces wherever elastomeric sealants are used.

E. Apply primer or sealer to joint surfaces wherever recommended by sealant manufacturer.

F. Do not attempt to cut, seam, nip, or abrade glass that is tempered, heat strengthened, or coated.

G. Inspect each piece of glass immediately before installation, and eliminate any which have observable edge damage or face imperfections. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

H. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

I. Glass shall be set without springing or forcing and carefully centered laterally and vertically so as to provide uniform clearance. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

J. Install setting blocks of proper sizes at quarter points of sill rabbet. Set blocks in thin course of heelbead compound / sealant, if any.

K. Provide spacers inside and out, and of proper size and spacing, for all glass sizes where the length plus width is larger than 50 united inches, except where gaskets are used for glazing.

    1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.

    2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

L. Unify appearance of each series of lights by setting each piece to match others as nearly as possible. Inspect each piece and set

with pattern, drawn, and bow oriented in the same direction as other pieces.

M. Clearance Requirements: Allow the following minimum nominal clearances, in accordance with glass manufacturer's recommendations; glass face to channel face, glass edge to frame member, and glass bite:

Glass Thickness	Face Clearance	Edge Clearance	Bite
Up to 1/4-inch	1/8-inch	1/4-inch	1/4- to 3/8-inch
5/16- to 3/8-inch	3/16-inch	5/16-inch	5/16- to 7/16-inch
1/2- to 13/16-inch	1/4-inch	3/8-inch	1/2- to 5/8-inch
7/8-inch and over	1/4-inch	1/2-inch	1/2- to 7/8-inch

3.06 GLASS TO GLASS JOINTS:

A. Where glass panels join without mullion, bed joint with clear silicone sealing compound. For exterior applications a structural silicone bond joint is required. All materials to be joined must be compatible and meet the sealant manufacturer’s requirements for adhesion & design loading.

B. Edgework requirements for butt joint glazing applications shall be reviewed and approved by the architect prior to field installation due to a variation in edge quality based on the size, shape and thickness of the glass.

C. Factory clean cut edges shall meet the following recommendations for butt joint glazing applications:

1. 3/8” glass is acceptable for use with factory clean cut edges.
2. 1/2” glass up to a maximum length of 100” on the butt joint edge can be used with factory clean cut edges.
3. 1/2” glass over 100” in length and 5/8” and thicker glass in any length should not be used with a factory clean cut edge.

3.07 SEALANT APPLICATION:

A. Force sealants into channel to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.

B. Tool exposed surfaces of glazing liquids and compounds to provide a

substantial "wash" away from the glass. Install pressurized tapes and gaskets to protrude slightly out of the channel, so as to eliminate dirt and moisture pockets.

C. Clean and trim excess glazing materials from the glass and stops or frames promptly after installation, and eliminate stains and discolorations.

D. Cure glazing sealants and compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability.

3.08 GASKET GLAZING (DRY):

A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Install gaskets so they protrude past face of glazing stops.

3.09 EXTERIOR COMBINATION METHOD (TAPE AND SEALANT):

A. Cut glazing tape to proper lengths prior to application, install against permanent stop, 3/16-inch to 1/4-inch below sightline.

B. Do not lap the adjoining lengths of tape or rubber shim, as this will prevent full contact around perimeter of glass:

1. Strips must be installed in four separate sections, not run continuously around corners.

C. Place setting blocks at 1/4 points.

D. Rest glass on setting blocks and press against tape with sufficient pressure to ensure full contact and adhesion at perimeter.

E. Install removable stops; insert continuous spacer strips between glass and applied stop to keep glass in compression against the tape.

1. Install in four separate sections.

F. Sealant cavity pocket, formed by setting of the applied stop, shall then be filled to the sight line with sealant.

G. Cap bead shall not exceed 1/16 inch above sight line onto glass surface.

H. Tool or wipe cap bead with solvent for smooth appearance.

3.10 INTERIOR DRY METHOD (TAPE AND TAPE):

A. Cut glazing tape to length and install against permanent stop, projecting 1/16-inch above sightline.

B. Place setting blocks at 1/4 points.

C. Rest glass on setting blocks and push against stop for full contact and adhesion at perimeter.

D. Place glazing tape on free perimeter of glass in same manner described above.

E. Install removable stop, avoid displacement of tape, exert pressure on tape for full continuous contact.

F. Knife trim excess or protruding tape.

3.11 CLEAN-UP AND PROTECTION:

A. Protect exterior glass from breakage immediately upon installation by attachment of crossed streamers to framing held away from glass. DO NOT APPLY MARKERS OF ANY TYPE TO SURFACES OF GLASS. Remove nonpermanent labels, and clean surfaces.

B. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in any other way during the construction period, including natural causes, accidents, and vandalism. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

C. Remove all excess glazing material from all installed glass. Maintain glass in a reasonably clean condition during construction, so that it will not be damaged by corrosive action and will not contribute (by wash-off) to the deterioration of glazing materials and other surfaces. Any soiling occurring on the glass shall be promptly and completely washed off.

D. Carefully and completely remove all markings and labels from glass surfaces. Do not apply markers to glass surfaces.

E. Wash and polish glass on both faces with a mild neutral or slightly acidic solution as recommended by the glass manufacturer not more than four days prior to Owner's acceptance of the work in each area. Attach crossed streamers away from glass face.

F. Care shall be taken during cleaning to avoid scratching of glass surfaces by grit particles.

G. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.

END OF SECTION

DIVISION 8 - DOORS AND WINDOWS

SECTION 08806 - FIRE RATED GLAZING (FIRELITE PLUS, FIREGLASS 20 & PYROSTOP)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.02 WORK INCLUDED

A. Furnish and install appropriate fire-rated glazing materials in all fire rated assemblies including door vision lights, transoms, borrowed lites and/or window units.

1. For non-rated assemblies, see Specification Section 08800.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Division 1 Section 01352 - *"LEED Requirements"* for recycled content and regional materials requirements, submittals, and additional LEED requirements.
B. Division 1 Section 01524 - *"Construction Waste Management"* for recycling construction waste.
C. Division 7 Section *07910 - "Joint Sealants"*.
D. Division 8 Section 08110 - *"Steel Doors and Frames".*
E. Division 8 Section 08211 - *"Flush Wood Doors".*

1.04 REFERENCE STANDARDS:

A. Consumer Product Safety Commission (CPSC):

1. CPSC 16FR 1201 – Safety Standards for Architectural Glazing Materials.

B. American Society for Testing and Materials (ASTM):

1. ASTM E2010-01 – Standard Test Method for Positive Pressure Fire Tests of Window Assemblies.
2. ASTM E2074-00 – Standard Test Method for Fire Tests of Door Assemblies, including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies.
3. ASTM E163 – Methods for Fire Tests of Window Assemblies.
4. ASTM E773 – Test Method for Seal Durability of Sealed Insulating Glass Units.
5. ASTM E838 – Cracking, Blistering, Crazing and Color Change.
6. ASTM E 119: Fire Tests of Building Construction and Materials.

C. National Fire Protection Association (NFPA):

1. NFPA 80 – Fire Doors and Windows.
2. NFPA 252 – Fire Tests of Door Assemblies.
3. NFPA 257 – Fire Tests of Window Assemblies.

D. Underwriters Laboratories, Inc. (UL):

1. UL 9 – Fire Tests of Window Assemblies.
2. UL 10B – Fire Tests of Door Assemblies.
3. UL 10C – Positive Pressure Fire Tests of Door Assemblies.

E. Glass Association of North America (GANA):

1. GANA – Glazing Manual.
2. FGMA – Sealant Manual.

F. American National Standards Institute (ANSI):

1. ANSI Z97.1: Standard for Safety Glazing Materials Used in Buildings FGMA – Sealant Manual.

1.05 PERFORMANCE REQUIREMENTS

A. ***FireLite Plus***® - Fire-rated glass ceramic laminated clear and wireless glazing material for use in impact safety-rated locations such as doors, transoms and borrowed lites with fire rating requirements ranging from 20 minutes to 3 hours with hose stream test.

B. ***Fireglass20***® - Fire-rated tempered glass clear and wireless glazing material for use in impact safety-rated locations with fire rating requirements of 20 minutes without hose stream test; for use in interior and exterior applications.

C. Product shall pass positive pressure tests standards: UL 10C, UBC 7-2 and UBC 7-4.

A. Safety Glazing: Comply with testing requirements of CPSC 16 CFR 1201, safety regulation for architectural glazing in hazardous locations for Category I & II materials.

2.02 SUBMISSIONS

A. Submissions shall be in accordance with Section 01300 – *Submissions* and as modified below.

B. Product Data – Glass:

1. Submit manufacturer's technical data, specifications, and installation and maintenance instructions for each type of

glass required. Include test data substantiating that glass complies with specified requirements. Include Certificates of Compliance from glass manufacturers attesting that glass materials furnished for project comply with requirements. Separate certification will not be required for glazing materials bearing manufacturer's permanent label designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authority having jurisdiction.

C. Samples:

1. Submit three (3) 12" square samples of each type of glass required. Architect's review of samples will be for color, texture, and pattern only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

D. Shop Drawings: Prior to placement of glass order or glass fabrication, the Contractor shall pertinent shop drawings (i.e. – windows, doors, borrowed light frames, etc.) which have been:

1. Checked and approved by the General Contractor, stamped and dated.
2. Reviewed by the Architect, with stamp affixed.

E. Product Test Listings: From UL indicating fire-rated glass complies with requirements, based on comprehensive testing of current product.

F. LEED Submittals: (For LEED Projects only)

1. Submit recycled content and regional materials documentation for each type of product provided under work of this Section in accordance with Section 01352 *"LEED Requirements"*.

2. Credit EQ 4.1: Manufacturers' product data for interior field-applied adhesive and sealant products included in this section, including printed statement of VOC content in accordance with Section 01352 *"LEED Requirements"*.

2.03 QUALITY ASSURANCE

A. Glazing Standards: FGMA Glazing Manual and Sealant Manual.

B. Fire Protective Rated Glass: Each lite shall bear permanent, non-removable label of UL and/or WHI certifying it for use in tested and rated fire protective assemblies.

C. Fire Protective Glazing Products for Door Assemblies: Products identical to those tested per ASTM E 152 and UL 10B, labeled and listed by UL and/or WHI or other certification agency acceptable to authorities having jurisdiction.

2.04 DELIVERY, STORAGE AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Deliver all materials to project site in manufacturer's original packaging, undamaged, complete with installation instructions.

C. Store off ground, under cover, protected from weather and construction activities

2.05 PROJECT CONDITIONS:

A. Field Measurements: Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.10 WARRANTY:

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MATERIALS

A. ***FireLite Plus***® as manufactured by Nippon Electric Glass Company, Ltd., and distributed by Technical Glass Products, 8107 Bracken Place SE, Snoqualmie, WA 98065, voice 1-800-426-0279, fax 1-800-451-9857,
e-mail sales@fireglass.com, web site www.fireglass.com

1. FireLite Plus® glazing sizes shall be as shown on the drawings:

2. Properties: All fire rated ceramic glass designated on the drawings shall carry the following properties:

   a. Thickness: 5/16 inch.
   b. Weight: 4.0 lbs. / sq.ft.
   c. Approximate Visible Transmission: 85 percent.
   d. Approximate Visible Reflection: 9.0 percent.
   e. Fire-Rating: 20 minutes to 3 hours for doors; 20 minutes to 90 minutes for other applications – refer to Contract Drawings for ratings.
   f. Impact Safety Resistance: CPSC 16CFR1201 (Cat. I and II) & ANSI Z97.1.
   g. STC Rating: Approximately 38 dB.

h. Surface Finish: Standard Grade-Comparable surface finish to alternative fire-rated ceramic products marketed as "Premium"
i. Positive Pressure Test: UL 10C, UBC 7-2 and 7-4; passes.

3. Maximum sheet sizes based on surface finish: Standard 48 inches by 96 inches.

4. Labeling: Each piece of FireLite Plus® shall be permanently labeled with the FireLite® logo, UL logo and fire rating in sizes up to 3,325 sq. in., and with the FireLite® label only for sizes that exceed the listing. FireLite Plus® shall be glazed into the appropriate fire-rated frame(s) with an approved glazing compound (Silicone or Closed Cell PVC Tape) as supplied by the Installer.

5. Fire Rating: Fire rating listed and labeled by UL for fire rating scheduled at opening locations on drawings, when tested in accordance with ASTM E2074-00 and ASTM E2010-01; NFPA 252 and NFPA 257; and UL 9, UL 10B, and UL 10C.

B. ***Fireglass20®*** as manufactured by J.R. Four Ltd., and distributed by Technical Glass Products, 8107 Bracken Place SE, Snoqualmie, WA 98065, voice 1-800-426-0279, fax 1-800-451-9857, e-mail sales@fireglass.com, web site www.fireglass.com

1. Fireglass20® glazing sizes shall be as shown on the drawings:

2. Properties: All 20 minute fire rated glass designated on the drawings shall carry the following properties:

a. Thickness: 1/4 inch.
b. Weight: 3.0 lbs. / sq.ft.
c. Approximate Visible Transmission: 89 percent.
d. Approximate Visible Reflection: 8.0 percent.
e. Fire-Rating: 20 minutes (WITHOUT HOSE STREAM TEST)- refer to Contract Drawings.
f. Impact Safety Resistance: CPSC 16CFR1201 (Cat. I and II) & ANSI Z97.1

3. Labeling: Each piece of Fireglass20® shall be permanently labeled fireglass 20™ with the fireglass 20™ logo, UL logo and fire rating in sizes up to 6,396 sq. in.

4. Fire Rating: Fire rating listed & labeled by UL for fire rating scheduled at opening locations on drawings, when tested in accordance with ASTM E2074-00; NFPA 252; & UL 9, UL 10B, & UL 10C.

2.02 FABRICATION

A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face

clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

2.03 DELIVERY AND STORAGE

A. Delivered materials shall match the approved samples. Packaged materials shall be delivered in the original unopened labeled containers of the manufacturer, clearly marked with their name and brand.

B. Each pane of glass shall be factory labeled; removed only at the time specified hereinafter. Store glass, while awaiting installation, in a dry, well-ventilated location at a constant temperature maintained above dew point.

C. Glass that is cracked, broken, chipped, or otherwise damaged during transportation, storage, and erection, and all glazing and sealing materials unfit for use shall be removed from the job site and replaced with acceptable materials at the Contractor's expense.

C. All Glazing broken or damaged during construction up to the date of substantial completion shall be removed from the job site and replaced with acceptable materials at the Contractor's expense.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine glass framing, with glazier present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.
2. Minimum required face or edge clearances.
3. Observable edge damage or face imperfections.

B. Do not proceed with glazing until unsatisfactory conditions have

been corrected.

C. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

3.02 INSTALLATION

A. General:

1. Verify, by measurements at the job site, all dimensions affecting this work.
2. Comply with FGMA or GANA (For Pyrostop) standards and instructions of manufacturers of glass, glazing, sealants and glazing compounds.
3. Protect glass from edge damage during handling and installation. Inspect glass during installation and discard pieces with edge damage that could affect glass performance.
4. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
5. Cut glazing tape to length and set against permanent stops, flush with sight lines to fit openings exactly, with stretch allowance during installation.
6. Place setting blocks located at quarter points of glass with edge block no more than 6 inches from corners.
7. Glaze vertically into labeled fire-rated metal frames or partition walls with same fire rating as glass and push against tape for full contact at perimeter of pane or unit. Glass shall be set without springing or forcing and carefully centered laterally and vertically so as to provide uniform clearance.
8. Place glazing tape on free perimeter of glazing in same manner described above.
9. For Fireglass20® Provide minimum edge clearance of >1/4 inch (+1/8 inch/-1/16 inch) and a minimum edge cover of <3/8 inch (+1/16 inch/-1/16 inch).
10. For Pilkington Pyrostop® provide minimum 3/16 inch edge clearance
11. Install removable stop and secure without displacement of tape. Prior to glazing, remove stops and clean out all dirt, oil, droppings, or other material, which will affect proper glazing.
12. Use specified glazing compound, without alteration; bed glazing material in glazing compound; entirely fill all recess and spaces. Provide visible glazing compound with smooth and straight edges.
13. Install in vision panels in fire-rated doors to requirements of NFPA 80.
14. Install so that appropriate UL and FireLite Plus®, Fireglass20® & Pilkington Pyrostop® markings remain permanently visible and upright.

3.02 PROTECTION AND CLEANING

A. Glass shall be suitably screened from paint, construction debris, and the like. All such soiling occurring on glass shall be promptly and completely washed off by methods approved by the glass manufacturer.

B. Upon completion of installation and acceptance, markings and labels of whatever sort shall be carefully and completely removed from glass panels and the glass washed clean with a mild neutral or slightly acidic solution as recommended by the glass manufacturer, after which no marking or labels of any sort shall be placed on the glass. Care shall be taken during cleaning to avoid scratching of glass surfaces by grit particles.

C. Ventilate buildings after glazing by opening windows slightly to prevent condensation on glass. Maintain ventilation until compound has set.

3.03 GUARANTEE

A. The Contractor shall guarantee all workmanship and material in accordance with the General Conditions and Section 01700 – Contract Closeout.

END OF SECTION

DIVISION 8 - DOORS AND WINDOWS

SECTION 08870 – SECURITY WINDOW FILM

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Safety and Security Window Film:
   1. Clear microlayered film. (Ultra S800)

B. RELATED SECTIONS

1. Division 7 Section *"Joint Sealants"*.
2. Division 7 Section *"Building Insulation"*
3. Division 8 Section *"Steel Doors and Frames"*.
4. Division 8 Section *"Aluminum Doors and Frames"*.
5. Division 8 Section *"FRP Doors and Frames"*.
6. Division 8 Section *"Flush Wood Doors"*.
7. Division 8 Section *"Aluminum Entrances & Storefronts"*.
8. Division 8 Section *"Aluminum Windows"*.
9. Division 8 Section *"Vinyl Clad Wood Windows"*.
10. Division 8 Section *"Vinyl Clad Wood Doors"*.
11. Division 8 Section *"Glazed Aluminum Curtain Walls"*

1.02 REFERENCE STANDARDS:

A. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.

B. ASHRAE - American Society for Heating, Refrigeration, and Air Conditioning Engineers; Handbook of Fundamentals.

C. ASTM International (ASTM):
   1. ASTM D 882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
   2. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers -- Tension.
   3. ASTM D 624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
   4. ASTM D 1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting.
   5. ASTM D 1044 - Standard Method of Test for Resistance of Transparent Plastics to Surface Abrasion (Taber Abrader Test).
   6. ASTM D 2240 - Standard Method for Rubber Property - Durometer Hardness.
   7. ASTM D 2582 - Standard Test Method for Puncture-Propagation Tear Resistance of Plastic Film and Thin Sheeting.
   8. ASTM D 5895 - Standard Test Methods for Evaluating Drying or Curing During Film Formation of Organic Coatings Using Mechanical Recorders.
   9. ASTM D 4830 - Standard Test Methods for Characterizing Thermoplastic Fabrics Used in Roofing and Waterproofing.
   10. ASTM E 84 - Standard Method of Test for Surface Burning Characteristics of Building Materials.
   11. ASTM E 308 - Standard Recommended Practice for

Spectrophotometry and Description of Color in CIE 1931 System.

12. ASTM E 903 - Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.
13. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
14. ASTM E 1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
15. ASTM F 1642 - Standard Method of Test for Glazing and Glazing Systems Subject to Airblast Loadings
16. ASTM F 2912 - Standard Specification for Glazing and Glazing Systems Subject to Airblast Loadings.

D. Consumer Products Safety Commission 16 CFR, Part 1201 - Safety Standard for Architectural Glazing Materials.

E. GSA-TS01 - Standard Test for Glazing and Glazing Systems Subject to Airblast Loadings.

F. NFRC 100/200 (Formerly ASTM E903) - Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.

G. IES LM-83-12: IES Spatial Daylight Autonomy (sDA) and Annual Sunlight Exposure.

H. ISO 16933, International Standard for Glass in Building: Explosion-resistant security glazing - Test and classification for arena air-blast testing.

I. Underwriters Laboratories Inc. (UL): UL 972 - Burglary Resisting Glazing Material.

J. Window 6.3 - A Computer Tool for Analyzing Window Thermal Performance; Lawrence Berkeley Laboratory.

1.02 DEFINITIONS:

A. Light to Solar Gain Ratio: The ratio of visible light transmission to Solar Heat Gain Coefficient.

1.03 PERFORMANCE REQUIREMENTS:

A. Safety Glazing Impact Performance:
   1. 400 ft-lbs impact resistance, meeting ANSI Z97.1 (Class A, Unlimited) and 16 CFR 1201 (Category 2) impact requirements with film applied on 1/4 inch annealed glass.
   2. Impact Resistance after Aging: 400 ft-lbs, meeting ANSI Z97.1 (Class A, Unlimited) and 16 CFR 1201 (Category 2) impact requirements with film applied on 1/8 inch annealed glass.

B. Blast Hazard Mitigation Performance:
   1. GSA Rating of "2"/ ASTM F1642 "No Hazard" with minimum blast

load of 9 psi and 63 psi*msec, on1/4" single pane glass and film attachment system.
2. GSA Rating of "2" / ASTM F1642 "Minimal Hazard" with minimum blast load of 10 psi and 89 psi*msec, on 1 inch (25 mm) double pane glass and film attachment system.
3. GSA Rating of "3B" / ASTM F1642 "Very Low Hazard" with minimum blast load of 5 psi and 28 psi*msec, on 1/4" pane glass without film attachment system.
4. GSA Rating of "3B" / ASTM F1642 "Low Hazard" with blast minimum load of 10 psi and 42 psi*msec, on 1 inch (25 mm) double pane glass without film attachment system.

C. Impact Resistance and Pressure Cycling:
1. ASTM E1996 / E1886: Large Missile "C", +/- 75 psf Design Pressure

D. Tear Resistance:
1. Minimum Graves Area Tear Strength of 1,200 lbs% as measured on coated film product, without liner, per ASTM D1004.

E. Adhesion to Glass:
1. Minimum 6 lbs/in peel strength per ASTM D3330 (Method A).

F. Flammability: Surface burning characteristics when tested in accordance ASTM E 84, demonstrating film applied to glass rated Class A for Interior Use:
1. Flame Spread Index: no greater than 25.
2. Smoke Developed Index: no greater than 55.

G. Abrasion Resistance:
1. Film shall have a surface coating that is resistant to abrasion such that less than 3 percent increase of transmitted light haze will result when tested in accordance to ASTM D 1044 using 100 cycles, 500 grams weight, and the CS10F Calibrase Wheel.

H. UV Light Rejection:
1. Minimum of 99.9% UV light rejection (300 - 380 nm), per ASTM E903, as determined with film applied on 1/4 inch clear glass.

1.04 SUBMITTALS:

A. Submissions shall be in accordance with Section 01300 – “Submissions” and as modified below.

B. Product Data: Manufacturer's current technical literature on each product to be used, including:
1. Manufacturer's Data Sheets.
2. Preparation instructions and recommendations.
3. Storage and handling requirements and recommendations.
4. Installation methods.

C. 3rd Party Test Report Submittal Requirements. Submit the following 3rd Party test reports indicating compliance with the test values listed in this section.
1. Flammability Testing, ASTM E84.
2. Film Properties Testing, ASTM D882.
3. Abrasion Resistance Testing, ASTM D1044.

4. Peel Strength Testing, ASTM D3330.
5. Tear Resistance Testing, ASTM D1004.
6. Puncture Strength Testing, ASTM D4830.
7. Safety Glazing Impact Testing, ANSI Z97.1 and/or 16 CFR 1201.
8. Impact Resistance and Pressure Cycling, ASTMs E1886 and E1996.
9. Blast Hazard Mitigation Testing, ASTM F1642 / F2912 and/or GSA-TS01-2003.

D. Other Product Submittals:
1. Manufacturer's summary of 3rd Party Blast Hazard Mitigation Testing, ASTM F1642 / F2912 and/or GSA-TS01-2003
2. 3rd Party test reports from Forced Entry Resistance evaluations.

E. Verification Samples: For each film specified, two samples representing actual film color and pattern.

1.05 QUALITY ASSURANCE:

A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years experience.
1. Provide documentation that the adhesive used on the specified films is a Pressure Sensitive Adhesive (PSA).

B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five years demonstrated experience in installing products of the same type and scope as specified.
1. Provide documentation that the installer is authorized by the Manufacturer to perform Work specified in this section.
2. Provide a commercial building reference list of 5 properties where the installer has applied window film. This list will include the following information:
a. Name of building.
b. The name and telephone number of a management contact.
c. Type of glass.
d. Type of film and/or film attachment system.
e. Amount of film and/or film attachment system installed.
f. Date of completion.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

1.06 DELIVERY, STORAGE, AND HANDLING:

A. Follow Manufacturer's instructions for storage and handling.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local

authorities having jurisdiction.

1.06 PROJECT CONDITIONS:

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.07 WARRANTY:

A. At project closeout, provide to Owner or Owners Representative an executed current copy of the manufacturer's standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.

B. In order to validate warranty, installation must be performed by an Authorized 3M dealer and according to Manufacturer's installation instructions. Verification of Authorized 3M dealer can be confirmed by submission of active 3M dealer code number.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. Acceptable Manufacturer: 3M Commercial Solutions, which is located at: 3M Center Bldg. 220-12-E-04; St. Paul, MN 55144-1000; Toll Free Tel: 888-650-3497; Tel: 651-737-1081; Fax: 651 737 8241; Email:request info (vkampmeyer@mmm.com); Web:http://www.3m.com/3M/en_US/architectural-design-us/?utm_medium=redirect&utm_source=vanity-url&utm_campaign=www.3M.com/AMD|http://www.3m.com/3M/en_US/building-window-solutions-us

2.02 CLEAR MICROLAYERED SAFTEY AND SECURITY WINDOW FILM:

A. 3M Scotchshield Ultra S800 Safety and Security Window Film. Optically clear microlayered polyester film, nominally 8 mils (0.008 inch) thick, with a durable acrylic abrasion resistant coating over one surface and a pressure sensitive adhesive on the other. The film is clear and does not contain dyed polyester. The adhesive is pressure-activated, not water-activated, and forms a physical bond, not chemical bond, to the glass. The film is microlayered with both plastic and ductile polyester layers for tear resistance.
   1. Physical / Mechanical Performance Properties (nominal):
      a. Film Color: Clear.
      b. Film Thickness (excluding coatings or adhesive liner): Nominal 8 mils
      c. Tensile Strength (ASTM D882):
         1) Base Film: 32,000 psi (MD) / 32,000 psi (TD).
         2) Coated Film: 32,000 psi (MD) / 32,000 psi (TD).
      d. Break Strength (ASTM D882):
         1) Base Film: 250 lb/in (MD) / 250 lb/in (TD).
         2) Coated Film: 245 lb/in (MD) / 265 lb/in (TD).

e. Percent Elongation at Break (ASTM D882):
    1) Base Film: 115 % (MD) / 115 % (TD).
    2) Coated Film: 132 % (MD) / 130 % (TD).
f. Yield Strength:
    1) Base Film: 12,000 psi (MD).
    2) Coated Film: 15,000 psi (MD).
g. Percent Elongation at Yield (ASTM D882):
    1) Base Film: 7% (MD).
    2) Coated Film: 9% (MD).
h. Graves Tear Resistance (ASTM D1004):
    1) Maximum Force (lbs):
        a) Base Film: 40 (MD) / 40 (TD).
        b) Coated Film: 40 (MD) / 40 (TD).
    2) Maximum Extension (in):
        a) Base Film: 0.45 (MD) / 0.65 (TD).
        b) Coated Film: 0.50 (MD) / 0.57 (TD).
    3) Graves Area Tear Resistance (lbs%):
        a) Base Film: 1,100 (MD) / 1,300 (TD).
        b) Coated Film: 1,100 (MD) / 1,300 (TD).
i. Puncture Propagation Tear Resistance (ASTM D2582):
    1) Coated Film: 9 lbf (MD) / 10 lbf (TD).
j. Puncture Strength (ASTM D4830):
    1) Material Properties (as supplied).
    2) Coated Film: 185 lbf.

2. Uniformity: No noticeable pin holes, streaks, thin spots, scratches, banding or other optical defects.
3. Variation in Total Transmission across the width: Less than 2 percent over the average at any portion along the length.
4. Identification: Labeled as to Manufacturer as listed in this Section.
5. Solar Performance Properties: Film applied to 1/4 inch (6 mm) thick clear glass.
    a. Visible Light Transmission (ASTM E 903): 87 percent.
    b. Visible Reflection (ASTM E 903): Not more than 10 percent.
    c. Ultraviolet Transmission (ASTM E 903): Less than 0.5 percent.
    d. Solar Heat Gain Coefficient (ASTM E 903): 0.79
6. Impact Resistance for Safety Glazing: Tested on 1/4 inch (6 mm) annealed glass.
    a. Safety Rating (CPSC 16 CFR, Part 1201): Category II (400 ft.-lbs).
    b. Safety Rating (ANSI Z97.1): Class A, Unlimited Size.
7. Impact Resistance and Pressure Cycling: Film shall pass impact of Large Missile "C" and withstand subsequent pressure cycling (per ASTMs E1996 and E1886) at +/ 75 psf Design Pressure with use of 3M Impact Protection Adhesive. Film applied to 1/4-inch tempered glass.
8. Blast Hazard Mitigation:
    a. GSA Rating of "2" / ASTM F1642 "Minimal Hazard" with blast pressure of 7 psi and 44 psi*msec blast impulse, on 1/4 inch (6 mm) annealed single pane glass and 3M Impact Protection Profile Attachment system
    b. GSA Rating of "2"/ ASTM F1642 "Minimal Hazard" with blast pressure of 7 psi and 43 psi*msec blast impulse, on 1/4 inch (6 mm) tempered single pane glass and 3M Impact Protection Profile Attachment system

c. GSA Rating of "2" / ASTM F1642 "Minimal Hazard" with blast pressure of 9 psi and 62 psi*msec blast impulse, on 1/4 inch (6 mm) annealed single pane glass and 3M Impact Protection Adhesive Attachment system
d. GSA Rating of "2" / ASTM F1642 "No Hazard" with blast pressure of 9 psi and 63 psi*msec blast impulse, on 1/4 inch (6 mm) tempered single pane glass and 3M Impact Protection Adhesive Attachment system
e. GSA Rating of "2" / ASTM F1642 "Minimal Hazard" with blast pressure of 9 psi and 60 psi*msec blast impulse, on 1 inch (25 mm) annealed double pane glass and 3M Impact Protection Profile Attachment system
f. GSA Rating of "2" / ASTM F1642 "Minimal Hazard" with blast pressure of 10 psi and 89 psi*msec blast impulse, on 1 inch (25 mm) annealed double pane glass and 3M Impact Protection Adhesive Attachment system
g. GSA Rating of "3B" / ASTM F1642 "Very Low Hazard" with blast pressure of 4 psi and 28 psi*msec blast impulse, on 1/4 inch (6 mm) annealed single pane glass, daylight applied film (no attachment)
h. GSA Rating of "3B" / ASTM F1642 "Very Low Hazard" with blast pressure of 4 psi and 28 psi*msec blast impulse, on 1/4 inch (6 mm) tempered single pane glass, daylight applied film (no attachment)
i. GSA Rating of "3B" / ASTM F1642 "Low Hazard" with blast pressure of 7 psi and 42 psi*msec blast impulse, on 1 inch (25 mm) annealed double pane glass, daylight applied film (no attachment)

9. Forced Entry Resistance: Product shall have been evaluated for time to resist complete body passage by a qualified 3rd Party test lab.

PART 3 - EXECUTION

2.03 PREPARATIION:

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Refer to Manufacturer's installation instructions for methods of preparation for Impact Protection Adhesive or Impact Protection Profile film attachment systems.

2.04 INSTALLATION:

A. Film Installation, General:
1. Install in accordance with manufacturer's instructions.
2. Cut film edges neatly and square at a uniform distance of 1/8 inch (3 mm) to 1/16 inch (1.5 mm) of window sealant. Use new blade tips after 3 to 4 cuts.

3. Spray the slip solution, composed of one capful of baby shampoo or dishwashing liquid to 1 gallon of water, on window glass and adhesive to facilitate proper positioning of film.
4. Apply film to glass and lightly spray film with slip solution.
5. Squeegee from top to bottom of window. Spray slip solution to film and squeegee a second time.
6. Bump film edge with lint-free towel wrapped around edge of a 5-way tool.
7. Upon completion of film application, allow 30 days for moisture from film installation to dry thoroughly, and to allow film to dry flat with no moisture dimples when viewed under normal viewing conditions.
8. If completing an exterior application, check with the manufacturer as to whether edge sealing is required.

B. Impact Protection Adhesive Installation:
1. The film attachment system shall be applied according to the specifications of the Manufacturer by an Authorized Dealer/Applicator. Refer to 3M publication, 70-0709-0322-7, 3M Impact Protection Adhesive Attachment System Installation Instructions.
   a. For blast mitigation: minimum 1/2 inch bead overlap on both frame and film (excluding glazing stops or compression gaskets).
   b. For windborne debris protection: minimum 3/8 inch bead overlap on both frame and film (excluding glazing stops or compression gaskets).
2. To ensure a straight and consistent bead width is achieved, masking tape may be applied to film and frame surfaces prior to application.
3. With prior approval of the building owner or property manager, existing compression gaskets may be partially removed or trimmed to allow for a thinner bead and stronger anchorage. If removing the gaskets, sections shall be trimmed approximately 3 inches in length and inserted with appropriate spacing along all sides of the window to help secure the glazing during application and curing of the Impact Protection Adhesive.
4. The Impact Protection Adhesive shall be dispensed with a caulk gun with nozzle opening diameter sized to match the approximate size of the desired bead width.
5. A plastic putty knife or other tool with a clean straight edge shall be used to trowel and smooth out the adhesive. The completed adhesive bead shall be relatively triangular in shape.
6. Any masking tape used shall be carefully removed within 10 minutes after applying the wet glaze.

C. Impact Protection Profile Installation:
1. The film attachment system shall be applied according to the specifications of the Manufacturer by an Authorized Dealer/Applicator trained to install 3M Impact Protection Profile. Refer to 3M publication, 70-0709-0323-5, 3M Impact Protection Profile Attachment System Installation Instructions.
2. Each profile piece shall span continuously to both sides of the window, within 1/8 inch to the frame edge. Splicing the profile between frame edges is prohibited.

3. Profile shall be aligned and applied by 3M recommended or approved methods and tools to ensure a quality installation.
4. Corner joints shall be fabricated by 3M recommended and approved methods. No part of the profile adhesive shall make contact with an adjacent profile.
5. Sufficient pressure shall be evenly applied along the entire length of the profile to ensure full adhesion from both adhesive strips. A roller tool is required to minimize entrapment of air in the adhesive.

3.05 CLEANING AND PROTECTION:

A. Remove left over material and debris from Work area. Use necessary means to protect film before, during, and after installation.

B. Touch-up, repair or replace damaged products before Substantial Completion.

C. After application of film, wash film using common window cleaning solutions, including ammonia solutions, 30 days after application. Do not use abrasive type cleaning agents and bristle brushes to avoid scratching film. Use synthetic sponges or soft cloths.

END OF SECTION

DIVISION 8 - DOORS AND WINDOWS

SECTION 08930 - METAL GLAZING PANELS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Section Includes:

1. Supply and installation of all smooth baked enamel aluminum faced composite panels.

2. Supply and installation of all mounting systems necessary to retrofit panels as required. Include all flashings, anchorages, shims, furring, fasteners, gaskets and sealants, related flashing adapters and masking as necessary for a complete watertight installation.

3. All panel systems shall include shop-installed aluminum stiffeners on all panels of 20 square feet or larger. Minimum stiffener recommendation is (1) per (20) square feet of panel area.

4. Parapet copings, column covers, soffits, sills, border and filler items may be indicated as integral components of the panel system; refer to drawings for additional information.

5. All flashing metals required shall be provided and installed as a part of the panel system by the panel system installing contractor.

6. System to be fabricated and installed in accordance with local code requirements.

B. Related Documents:

1. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to the work of this section.

C. Related Work Specified Elsewhere;

1. Section 05100 – Structural Steel
2. Section 06100 – Rough Carpentry
3. Section 07200 – Insulation
4. Section 07600 – Flashings and Sheet Metal
5. Section 07910 – Sealants and Caulking
6. Section 09250 – Gypsum Wallboard
7. Section 09900 - Painting

1.02 SYSTEM DESCRIPTION

A. Design Requirements:

1. Provide panels as shown on drawings for installation in new/existing window systems, including required accessories for complete

installation.

2. The extent of the panel system work is indicated on the contract drawings and within these specifications.

1.03 SYSTEM PERFORMANCE

A. Composite panels shall be capable of withstanding building movements and weather exposures based on the following test standards required by the Architect and/or the local building code.

B. Wind Load: If system tests are not available, mock-ups shall be constructed and tests performed under the direction of an independent third party laboratory, which show compliance to the following minimum standards:

Panels shall be designed to withstand the Design Wind Load based upon the local building code, but in no case less than 20 pounds per square foot (psf) and 30 psf on parapet and corner panels. Wind load testing shall be conducted in accordance with ASTM E330 to obtain the following results:

Normal to the plane of the wall between supports, deflection of the secured perimeter-framing members shall not exceed L/175 or 3/4", whichever is less.

Normal to the plane of the wall, the maximum panel deflection shall not exceed L/60 of the full span.

Maximum anchor deflection shall not exceed 1/16".

At 1-1/2 times design pressure, permanent deflections of framing members shall not exceed L/100 of span length and components shall not experience failure or gross permanent distortion. At connection points of framing members to anchors, permanent set shall not exceed 1/16".

C. Air/Water System Test: If system tests are not available, mock-ups shall be constructed and tests performed under the direction of an independent third party laboratory, which show compliance to the following minimum standards:

Air Infiltration - When tested in accordance with ASTM E283, air infiltration at 1.57 psf must not exceed 0.06 cfm/ft² of wall area.

Water Infiltration - Water infiltration is defined as uncontrolled water leakage through the exterior face of the assembly. Systems not using a construction sealant at the panel joints (i.e. Rout and Return Dry and Rear Ventilated Systems) shall be designed to drain any water leakage occurring at the joints. No water infiltration shall occur in any system under a differential static pressure of 6.24 psf after 15 minutes of exposure in accordance with ASTM E331.

Pressure Equalized Rain Screen Systems shall comply with AAMA 508-05 Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems.

1.04 SUBMITTALS

A. Comply with requirements of Section 01300 - Submissions and as modified below.

B. Product Data:

1. Submit six (6) copies of all manufacturer's product literature, product specifications, test reports, installation instructions, and similar data required to demonstrate compliance with specified requirements.

C. Samples:

1. For Metal Panels: Submit a complete set of 2" x 2" samples of steel sheet demonstrating full range of baked enamel colors available for color selection by Architect.

2. For Composite Panels: Submit a complete set of available colors / finishes for panels, and at least two (2) representative samples of each series of colors available. Samples shall be 4” x 4” minimum, displaying proposed lamination technique.

D. Quality Control Submittals:

1. Certificates: Submit certification or letter from panel manufacturer in accordance with Paragraph 1.04.B.a below.

E. Shop Drawings: Shop drawings shall show project layout and elevations; composition of required 7-ply panel construction; fastening and anchoring methods; detail and location of joints, sealants and gaskets, including all joints necessary to accommodate thermal movement; trim; flashing and accessories. Shop drawings shall show the preferred joint details providing a watertight and structurally-sound wall panel system that allows no uncontrolled water penetration on the inside face of the panel system as determined by ASTM E331. Systems not utilizing a construction sealant at the panel joints (i.e. Rout and Return Dry and Rear Ventilated System) shall provide a means of concealed drainage with baffles and weeps for water which may accumulate in members of the system.

F. Code Compliance: Submit documents showing product compliance with the national and local building code. These documents shall include, but not be limited to, appropriate Evaluation Reports and/or test reports supporting the use of the product.

G. Contract Closeout Submittals:

1. Comply with requirements of Section 01700, including submission of maintenance instructions as item in "General Construction Instructions" manual described in that section.

1.04 QUALITY ASSURANCE

A. Standards: Comply with the provisions of the standards listed below and the applicable standards listed in Section 01085 (including all revisions of contract to date):

1. American Society for Testing and Materials (ASTM):

   a. E283: Test for rate of Leakage through Exterior Windows, Curtain Walls, and Doors.

   b. E330: Test for structural performance of Exterior Windows, Curtain Walls, and Doors Under the Influence of Wind Loads.

   c. E331: Test for water penetration of exterior windows, curtain walls, and doors by Uniform Static Air Pressure Difference.

   d. E547: Test for water penetration of exterior windows, curtain walls, and doors by Cyclic Static Air Pressure Differential.

   e. D635: Standard Test method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.

   f. D822: Practice for Operating Light and Water Exposure Apparatus (Carbon-Arc Type) for Testing Paint, Varnish, Lacquer, and Related Products.

   g. D1308: Effect of Household Chemicals on Clear & Pigmented Organic Finishes.

   h. D1735: Method for Water Fog Testing of Organic Coatings.

   i. D1781: Climbing Drum Peel Test for Adhesives.

   j. D1929: Standard Test Method for Determining Ignition Temperature of Plastics.

   k. D2247: Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.

   l. D2794: Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).

   m. D3359: Methods for Measuring Adhesion by Tape Test.

   n. D3363: Method for Film Hardness by Pencil Test.

   o. E84: Surface Burning Characteristics of Building Materials.

   p. B117: Method of Salt Spray (Fog) Testing.

2. Aluminum Association:

   a. AA-C22-A41: Anodized - Clear Coatings.

   b. AA-C22-A42: Anodized - Integral Color Coatings.

3. American Architectural Manufacturers Association:

a. AAMA 508-05: Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems.

b. AAMA 2605-11: Superior Performance of Organic Coating on Aluminum

4. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.

5. Flat Glass Marketing Association (FGMA):

a. "Glazing Manual."

6. Composite panel manufacturers shall have established a Certification Program acceptable to local Code Authorities.

B. Qualifications of Manufacturer: Provide composite panels produced by a single manufacturer regularly engaged in the manufacture of units similar to those required and with a history of successful production acceptable to the Architect. All manufacturers shall have a minimum of fifteen (15) years experience in the manufacturing of these products, and be located within the continental United States. Manufacturers must be solely responsible for the manufacture of panels as well as the application of all finishes. Fabricator/installer shall be acceptable to the composite panel manufacturer(s). It is recommended that fabrication and installation of composite panels shall be from a single source; if not single source, both panel fabricator and the installer must submit proof of past successful collaboration.

1. Upgraded Project Requirements: All composite insulated panel components will be laminated into one monolithic unit. The manufacturer/laminator will have at least 25 years experience in the lamination of building panels for exterior use.

C. Qualifications of Installers:

1. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements of the manufacturer's recommended methods of installation needed for proper performance of the work of this section. All installers shall have a minimum of 5 years experience in architectural metal panel work similar in scope and size to this project. Submit documentation as proof, as a part of the submittals process.

D. Manufacturer's Certification: Prior to start of installation of the work of this section, secure visits to the job site by a representative of the manufacturer who shall inspect and certify that:

1. The openings in which the work of this section will be installed are all in condition suitable for installation.

2. The materials to be installed comply in all respects with the requirements of this section of these specifications.

3. The materials will be installed in complete accordance with the manufacturer's specifications.

E. Coordinate fabrication schedule with construction progress schedule as directed by the contractor, to avoid all delays of the work.

F. Shop drawings shall show the preferred joint details providing a watertight and structurally sound wall panel system that allows no uncontrolled water penetration, on the inside face of the panel system as determined by ASTM E331.

G. Maximum deviation from vertical and horizontal alignment of erected panels: 6 mm (1/4") in 6 m (20') non-accumulative.

H. Panel fabricator and installer shall assume undivided responsibility for all components of the exterior panel system, including but not limited to, attachment to sub-construction, panel-to-panel joinery, panel-to-dissimilar-material joinery and joint seal associated with the panel system.

The installer shall also supply & install perimeter closure angles (size to be field-verified) as required to seal closed all three sides of existing unit ventilators, radiators, and cabinetry scheduled to remain in current position, tied back to the composite panel framing system.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping:

1. Ship panels with finished surfaces protected from damage in accordance with manufacturer's recommendations.

B. Storage and Protection:

1. Store panels at site unit ready for installation in storage areas complying with manufacturer's recommendations.

1.06 PROJECT/SITE CONDITIONS

A. Field Measurements:

1. Take field measurements of existing windows before panel fabrication to verify required dimension and details. Review any discrepancies from Contract Documents found with Architect before proceeding with the fabrication. Coordinate the fabrication schedule with the construction schedule so as not to delay the progress of the work. Field fabrication may be allowed to ensure proper fit. However, field fabrication shall be kept to an absolute minimum with the majority of the fabrication being done under controlled shop conditions.

B. Maximum deviation from vertical and horizontal alignment of erected panels shall be ¼" (6 mm) in 20' (6 m), non-accumulative.

1.07 WARRANTY

A. Provide panel manufacturer's limited warranty for a minimum of 20 years providing that baked enamel finish, under normal atmospheric conditions, will not exhibit excessive fading of color, crazing, cracking, or flaking. (Max 5 fade based on ASTM D2244 and Max 8 chalk based on ASTM D4212 and delamination of the paint finish).

1. Manufacturer's obligation shall include repair or replacement of defective panels.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. For convenience, details and specifications have been based on "**Mapes-R+**" glazing panels as manufactured by Mapes Industries, Inc., Lincoln, Nebraska.

B. Other manufacturers offering similar products complying with specified requirements include:

1. *Greensteel Div.*, Adience Co. L.P., Dixonville, Pennsylvania.

2. *Inryco Architectural Products*, Milwaukee, Wisconsin.

C. Composite Panels: Total Panel Thickness shall be **2"**, nominal, 5-Ply construction, consisting of the following materials:

Face Material (to exterior side): Porcelain-on-Aluminum, pebble texture Fluoropon (Kynar 500) finish, standard color.
Exterior Back Substrate: min. 3/16" thick asbestos-free cement board
Insulating Core: 2.05 lb. density polyisocyanurate
Interior Back Substrate: Tempered Hardboard
Interior Back Material: Porcelain-on-Aluminum, smooth texture Fluoropon (Kynar 500) finish, standard color
Total Panel R-Value: 13.53; (total thickness, 2")

All insulated panels will consist of a finished face metal, laminated to a face stabilizer, an insulating core, back stabilizer and back face, each such material as specified below. The components will be laminated into one monolithic unit. The laminator will have at least 25 years experience in the lamination of building panels for exterior use. The adhesive used will be a permanently elastic type neoprene rubber-based adhesive and will be evenly applied to each surface area to be laminated. Adhesive bonding strength will be equal or exceed the bond strength of any of the stabilizer materials.

Tolerances will be:

Thickness: +0"-1/16"
Length/Width: +1/16"-1/16"

Squareness: 1/8” allowed difference between measured diagonals.
Flatness: 1/16” deflection in 12 lineal inches when measured with a straightedge.
Finish defect clearly visible at a distance of 10’.

Insulated Metal Panels: Insulated metal panels with window frames shall be fabricated with an outer and inner .032 thick, smooth aluminum skin, the outer skin laminated to asbestos-free mineral fiber reinforced cement board, minimum 3/16" thick, and the inner skin laminated to tempered 3/16” hardboard. The inner core shall be rigid isocyanurate insulation board. Total panel thickness shall be 3" or as indicated on the contract drawings as shown. Panels shall be ***"Mapes-R+ Panel”***, *as manufactured by* ***Mapes Industries, Lincoln, NE***, or as approved equal by the Architect; refer to Section 08930 for additional information. Aluminum skins shall receive a Fluoropon finish (Kynar 500), both exterior and interior faces in colors as selected by the Architect.

2.02 COMPONENTS

Mapes Panels:

A. Exterior and Interior Faces:

1. .032 smooth aluminum, pre-cleaned and treated to receive Fluoropon (Kynar 500) pebble finish at exterior / Fluoropon (Kynar 500) smooth finish.

B. Exterior and Interior Substrates:

1. Exterior Substrate - 3/16" asbestos-free mineral fiber reinforced cement board indicated with edge clearances and tolerances complying with manufacturer's recommendations.

2. Interior Substrate – 3/16” tempered hardboard indicated with edge clearances and tolerances complying with manufacturer’s recommendations.

C. Insulating Core:

1. 2.05 lb. density polyisocyanurate with edge clearances and tolerances complying with manufacturer's recommendations.

Panels will be seven-ply construction, consisting of the following materials:

Composite Panels:

Panel Fabrication: Composition: Two sheets of steel sandwiching a solid core of polyisocyanurate material formed in a continuous process with no glues or adhesives between dissimilar materials. The core material shall be free of voids and/or air spaces. Products laminated sheet by sheet in a batch process using glues or adhesives between materials shall not be acceptable.

Aluminum Face Sheets: Thickness - 0.50 mm (0.0197”) nominal. Alloy: AA3000 Series (painted metal) AA5000 Series (Anodized material).

Panel Weight: 4mm (0.157”): 1.12 lbs./sq.ft.

Tolerances:

Panel Bow: Maximum 0.8% of any 1828mm (72”) panel dimension.

Panel Dimensions: Field fabrication shall be allowed where necessary, but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible. Panel dimensions shall be such that there will be an allowance for field adjustment and thermal movement.

Panel lines, breaks, and angles shall be sharp, true, and surfaces free from warp and buckle.

Maximum deviation from panel flatness shall be 1/8" in 5'0" on panel in any direction for assembled units. (Non-accumulative - No Oil Canning).

System Characteristics:

Plans, elevations, details, characteristics, and other requirements indicated are based upon standards by one manufacturer. It is intended that other manufacturers, receiving prior approval, may be acceptable, provided their details and characteristics comply with size and profile requirements, and material/performance standards.

System must not generally have any visible fasteners, telegraphing or fastening on the panel faces or any other compromise of a neat and flat appearance.

System shall comply with the applicable provisions of the "Metal Curtain Wall, Window, Storefront, and Entrance Guide Specifications Manual" by AAMA and ANSI/AAMA 302.9 requirements for aluminum windows.

Fabricate panel system to dimension, size, and profile indicated on the drawings based on a design temperature of 68˚F.

Fabricate panel system so that no restraints can be placed on the panel, which might result in compressive skin stresses. The installation detailing shall be such that the panels remain flat regardless of temperature change and at all times remain air and water tight.

The finish side of the panel shall have a removable plastic film applied prior to fabrication, which shall remain on the panel during fabrication, shipping, and erection to protect the surface from damage.

Product Performance:

Bond Integrity: When tested for bond integrity, in accordance with ASTM D1781 (simulating resistance to panel delamination), there shall be no adhesive failure of the bond a) between the core and the skin nor b) cohesive failure of the core itself below the following values:

Peel Strength: 115 N mm/mm (22.5 in lb/in) as manufactured;

115 N mm/mm (22.5 in lb/in) after 21 days soaking in water at 70°F

Fire Performance:

Panels shall be classified in accordance with recognized standard tests:

ASTM E 84	Flame Spread Index must be less than 25, Smoke Developed Index must be less than 450; Passed Class A
ASTM D 1929	A self ignition temperature of 650°F or greater
ASTM D-635	Requires a CC1 classification

All Insulated Foam Panels must meet BCNYS Section 2603.4 Requirements:

Doors not required to have a fire protection rating; where pivoted or side-hinged doors are permitted without a fire protection rating foam plastic insulation having a Flame Spread Index of 75 or less and a Smoke Developed Index of not more than 450, shall be permitted as a core material where the door facing is of metal having a minimum thickness of 0.032-inch (0.8mm) aluminum or steel having a base metal thickness of not less than 0.016 inch (0.4 mm) at any point.

System Performance:

1. Composite panels shall be capable of withstanding building movements and weather exposures based on the following test standards required by the architect and/or local building codes:

a. Wind Load – If system tests are not available, under the direction of an independent third-party laboratory, mockups shall be constructed and tests performed to show compliance to the following minimum standards:

i. Panels shall be designed to withstand the design wind load based upon the local building code, but in no case less than 20 pounds per square foot (psf) and 30 psf on parapet and corner panels. Wind-load testing shall be conducted in accordance with ASTM E330 to obtain the following results.

ii. Normal to the plane of the wall between supports, deflection of the secured perimeter-framing members shall not exceed L/175 or 3/4", whichever is less.

iii. Normal to the plane of the wall, the maximum panel deflection shall not exceed L/60 of the full span.

iv. Maximum anchor deflection shall not exceed 1/16". At 1 1/2 times design pressure, permanent deflections of framing members shall not exceed l/100 of span length and components shall not experience failure or gross permanent distortion. At connection points of framing members to anchors, permanent set shall not exceed 1/16".

b. Air/Water System Test – If system tests are not available, under the direction of an independent third-party laboratory, mockups shall be constructed and tests performed to show compliance to the following minimum standards:

i. Air Infiltration – When tested in accordance with ASTM E283, air

infiltration at 1.57 psf must not exceed 0.06 cubic feet per minute per square foot of wall area.

ii. Water Infiltration – Water infiltration is defined as uncontrolled water leakage through the exterior face of the assembly. Systems not using a construction sealant at the panel joints (i.e., Dry Systems) shall be designed to drain any water leakage occurring at the joints. No water infiltration shall occur in any system under a differential static pressure of 6.24 psf after 15 minutes of exposure in accordance with ASTM E331.

The above tests are on panel systems that do not include a waterproof membrane behind panels.

System Type:

Provide Rout & Return (Wet) System: System must provide a wet seal (caulked) reveal. Sealant type shall be as required by the panel manufacturer, based on existing field conditions, also utilizing foamed type backer rod integral to system. Fabricator and installer must provide an engineered system including clips, fasteners, anchors, spacers, trim, flashings, sealant, etc.

Panel Finishes:

Coil coated Kynar® 500 or Hylar® 5000 based Polyvinylidene Fluoride (PVDF) or Fluoro Ethylene – Alkyl Vinyl Ether (FEVE) resin in conformance with the following general requirements of AAMA 2605. Fluoropolymer coating utilizing 70% Kynar 500 resins.

a. Color: (the Architect shall be allowed to select one of the following)
   1) Standard color as selected by the Owner / Architect from manufacturer's standard color palette.
   2) Custom color to be matched by the panel supplier.
   3) Clear coat over pretreated natural and brushed aluminum substrates.

b. Coating Thickness:
   1) Colors: 1.0 mil (±0.2 mil).
   2) Clear: 0.50 mil (± 0.05 mil).
   3) Coating shall be factory-applied on a continuous-process paint line. Nominal Dry Film Thickness: 1.50 mils.

   Coating shall consist of a 0.2 mil (approx.) prime coat and a 0.8 mil (approx.) finish coat, containing 70% Kynar 500 resins.

c. Hardness: ASTM D-3363; F-2H minimum, using Eagle Turquoise Pencil.
   Gloss: ASTM D523 standard at 60^{O} shall be 25-30.
   Flexibility T-Bend: ASTM D4145 shall be 0-2T-Bend; no pick-off.

d. Impact:
   1) Test Method: ASTM D-2794; Gardner Variable Impact Tester with 5/8" mandrel. ASTM D2794 1500 x metal thickness aluminum shall show no cracking or adhesion loss

2) Coating shall withstand reverse impact of 1.5"/pounds per mil substrate thickness.

3) Coating shall adhere tightly to metal when subjected to #600 Scotch Tape pick-off test. Slight minute cracking permissible. No removal of film to substrate.

e. Adhesion:

1) Test Method: ASTM D-3359 reverse impact 1/16" cross hatch shall show no cracking or adhesion loss.

2) Coating shall not pick off when subjected to an 11" x 11" x 1/16" grid and taped with #600 Scotch Tape.

f. Humidity Resistance:

1) Test Method: ASTM D-2247.

2) No formation of blisters when subject to condensing water fog at 100% relative humidity and 100°F for 4000 hours.

g. Salt Spray Resistance:

1) Test Method: ASTM B-117; Expose coating system to 4000 hours, using 5% NaCl solution.

2) Corrosion creepage from scribe line: 1/16" max.

3) Minimum blister rating of 8 within the test specimen field.

h. Weather Exposure:

1) Outdoor:

a. Ten-year exposure at 45° angle facing south Florida exposure.

b. Maximum color change of 5 Delta E units as calculated in accordance with ASTM D-2244.

c. Maximum chalk rating of 8 in accordance with ASTM D-4214.

d. No checking, crazing, adhesion loss.

i. Chemical Resistance:

1) ASTM D-1308 utilizing 10% Muriatic Acid for an exposure time of 24 hours. No loss of film adhesion or visual change when viewed by the unaided eye.

2) ASTM D-1308 utilizing 20% Sulfuric Acid for an exposure time of 18 hours. No loss of film adhesion or visual change when viewed by the unaided eye.

3) AAMA 2605 utilizing 70% reagent grade Nitric Acid vapor for an exposure time of 30 minutes. Maximum color change of 5 Delta E units as calculated in accordance with ASTM D-2244.

4) Acid Rain Test: Kesternich SO2, DIN 500180, 10 cycles min. No objectionable color change.

2. Anodized:

Color(Clear): AA-C22-A41 Architectural Class I
Color Coating: AA-C22-A44, light bronze, medium bronze, dark bronze and/ or all standard manufacturers colors. Architectural Class I (AA-C22-A42 Architectural Class II available upon request.)

3. Urethane Coating: For small quantity aluminum accent panels or custom color applications, provide a multi coat urethane finish in accordance with the paint manufacturer's requirements.

4. High Performance Clear:

   For application over pretreated natural and brushed aluminum substrates, provide a high performance single coat clear finish.

2.03 ACCESSORIES

Mapes Panels:

A. Sealant: Silicone sealant suitable for sealing joint between panel and window frame.

   1. Manufacturer's offering suitable products include:

      a. Dow Corning Corporation, Midland, Michigan.

      b. GE Silicones, General Electric Company, Waterford, New York.

B. Setting Blocks: Elastomeric setting blocks as recommended by panel manufacturer.

C. Sealant Tape: 100 percent solid butyl-based extruded sealant tape; similar or equal to "MBR-35" by Tremco, Cleveland, Ohio.

Composite Panels:

A. Extrusions, formed members, sheet, and plate shall conform with ASTM B209 and the recommendations of the manufacturer.

B. Panel stiffeners, if required, shall be structurally fastened or restrained at the ends and shall be secured to the rear face of the composite panel with silicone of sufficient size and strength to maintain panel flatness. Stiffener material and/or finish shall be compatible with the silicone.

C. Sealants and gaskets within the panel system shall be as per manufacturer's standards to meet performance requirements.

D. Fabricate flashing materials from 0.030" minimum thickness aluminum sheet painted to match the adjacent curtain wall / panel system where exposed. Provide a lap strap under the flashing at abutted conditions and seal lapped surfaces with a full bed of non-hardening sealant.

E. Fasteners(concealed/exposed/non-corrosive): Fasteners as recommended by panel manufacturer. Do not expose fasteners except where unavoidable and then match finish of adjoining metal.

2.04 FABRICATION

A. Panel components shall be factory-laminated into a single, monolithic unit in factory, using permanently elastic type neoprene or rubber based adhesive recommended by panel manufacturer applied over 100 percent of surface area using heat and pressure to develop adhesive bonding strength equal to, or greater than, internal bonding strength of components.

B. Shop/Factory Finishing: Apply protective coverings to all finished surfaces before the panels leave the factory.

C. Tolerances:

1. Thickness: +1/16" to -3/22".

2. Width and length: +1/8" to -1/8".

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verification of Conditions (by Installer):

1. Examine conditions under which composite insulating panels are to be installed and notify the Contractor in writing of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

B. Surfaces to receive panels shall be even, smooth, sound, clean, dry and free from defects detrimental to work. Notify the Contractor in writing of conditions detrimental to proper and timely completion of the work. Do not proceed with erection until unsatisfactory conditions have been corrected. All surfaces to receive panels shall be structurally sound, as determined by a registered Architect/Engineer as retained in contract by the Contractor. In no case shall metal structural supports be less than 18 gauge.

3.02 INSTALLATION

A. Comply with manufacturer's installation instructions and recommendations. All panels are to be erected plumb, level and true. All panels shall be erected in accordance with an approved set of shop drawings. Do not install component parts that are observed to be defective, including warped, bowed, dented, abraised and broken members.

1. Obtain the panel manufacturer's written approval methods for installation of panels into new window systems.

B. Unless otherwise recommended by the panel manufacturer or window

manufacturer, provide setting blocks at quarter points of each panel. Conform to the panel fabricator's instructions for installation of concealed fasteners.

C. Attachment system shall allow for the free and noiseless vertical and horizontal thermal movement due to expansion and contraction for a material temperature range of -20°F to +180°F. Buckling of panels, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement will not be permitted. Fabrication, assembly, and erection procedure shall account for the ambient temperature at the time of the respective operation. Anchor all panels securely per engineering recommendations and in accordance with approved shop drawings to allow for necessary thermal movement and structural support. Conform to the panel fabricator's instructions for the installation of concealed fasteners.

D. Do not cut, trim, weld, or braze component parts during erection in a manner which would damage the finish, decrease strength, or result in visual imperfection or a failure in performance. Return component parts which require alteration to shop for re-fabrication, if possible, or for replacement with new parts. Do not install component parts that are observed to be defective, including warped, bowed, dented, scraped or broken members.

E. Apply sealant tape around perimeter of window opening inside glazing rabbet to receive panels. Install panels carefully to ensure tape is not damaged or dislodged and that panel is tightly set against tape.

F. Separate dissimilar metals and use gasketed fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.

G. Provide for thermal expansion in assembly of groups of units.

H. Seal around the perimeter of the panels between panel and window frame with sealant in accordance with sealant manufacturer's application instructions.

3.03 ADJUSTING / CLEANING

A. Clean all panel surfaces promptly after installation. Remove excess sealant compounds, dirt, and other substances.

B. Remove and replace panels damaged beyond repair as a direct result of the panel installations. After installation, panel repair and replacement shall become the responsibility of the Contractor.

C. Repair panels with minor damage to the satisfaction of the Architect; replace unacceptably-repaired panels as directed by the Architect at no additional cost to the Owner.

D. Remove masking (if used) as soon as possible after installation.

Masking intentionally left in place after panel installation on an elevation, shall become the responsibility of the General Contractor.

E. Any additional protection, after installation, shall be the responsibility of the Contractor.

F. Ensure that all weep holes & drainage channels are unobstructed and free of dirt and sealants.

G. Final clean all areas affected by the work of this scope to the satisfaction of the Owner and the Architect.

END OF SECTION

DIVISION 9 - FINISHES

SECTION 09250 - GYPSUM WALLBOARD

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The work of this section is subject to all applicable provisions of the "General Conditions" and "Division 1 - General Requirements" which form part of this specification.

B. Provide all labor, materials, equipment, and services and perform all operations required to complete the installation of all work of this section and related work as indicated on the drawings and specified herein, including, but not necessarily limited to, the following:

1. Light gauge interior metal drywall studs for partitions and bulkhead framing.

2. Gypsum wallboard as specified, anchorages and control joints.

3. All trim, battens, corners, and similar items.

4. All required fastenings, framing, and attachments.

5. All adhesive, tapes, and joint compound systems as required.

6. Wall to wall corner expansion joints.

7. Metal drywall ceiling framing, furring and accessories.

8. Acoustical insulation and sealants.

C. Products installed but furnished under other sections and trades:

1. Metal drywall suspended ceiling grid system.

2. Metal wall/ceiling access panels furnished by other trades, as appropriate to project.

3. Metal lighting fixture plaster frames and rings, etc., within gypsum board ceiling system.

4. Cementitious backer units: Division 9 Section, "*Ceramic Tile*".

1.02 RELATED WORK

A. Related work specified under other sections of the specifications:

1. Division 7 Section "*Joint Sealants*".
2. Division 8 Sections for all doors and frames.
3. Division 9 Section "*Ceramic Tile*"; for cementitious backer units.

4. Division 9 Section "*Painting*": priming and final field paint finishing.
5. Division 16 Section "*Lighting*"; ceiling lighting fixtures with plaster frames and/or rings for recessing fixtures in gypsum board ceiling systems.

1.03 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM):

1. ASTM A525 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
2. ASTM C36 - Gypsum Wallboard.
3. ASTM C79 - Gypsum Sheathing Board.
4. ASTM C442 - Gypsum Backing Board and Core Board.
5. ASTM C475 - Joint Treatment Materials for Gypsum Wallboard Construction.
6. ASTM C630 - Water Resistant Gypsum Backing Board.
7. ASTM C635 - Manufacture, Performance, and Testing of Metal Suspension Systems
8. ASTM C645 - Non-Load (Axial) Bearing Steel Studs, Runners(Track), and Rigid Furring Channels for Screw Application of Gypsum Board.
9. ASTM C646 - Steel Drill Screws for the Application of Gypsum Sheet Material to Light Gage Steel Studs.
10. ASTM C665 - Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
11. ASTM C754 - Installation of Framing Members to Receive Screw Attached Gypsum Wallboard, Backing Board, or Water Resistant Backing Board.
12. ASTM C840 - Application and Finishing of Gypsum Board.
13. ASTM C931 - Exterior Gypsum Soffit Board.
14. ASTM C955 - Load-Bearing (Transverse and Axial) Steel Studs, Runners (track), and Bracing or Bridging, for Screw Application of Gypsum Board and Metal Plaster Bases.
15. ASTM C1002 - Steel Drill Screws for the Application of Gypsum Board.
16. ASTM C1047 - Accessories for Gypsum Wallboard and Gypsum Veneer Base.
17. ASTM C1278 - Fiber Reinforced Gypsum Panels.
18. ASTM E84 - Test method for Surface Burning Characteristics of Building Materials.
19. ASTM E136 - Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.
20. ASTM E119 - Method for Fire Tests of Building Construction and Materials.
21. ASTM F1267 - Specification for Metal, Expanded, Steel.

B. Gypsum Association (GA):

1. GA-201 – Gypsum Board for Walls and Ceilings.
2. GA-203 – Installation of Screw-Type Steel Framing Members to receive Gypsum Board.
3. GA-216 – Recommended Specifications for the Application and Finishing of Gypsum Board.
4. GA-600 – Fire Resistance Design Manual.

C. Underwriters Laboratory, Inc. (UL):

1. UL US-22 – Wallboard, Gypsum.
2. UL 40-U18 – Fire Resistance Classification.

D. Steel Structures Painting Council (SSPC):

1. SSPC – Painting Manual.

1.04 QUALITY ASSURANCE

A. To assure compatibility, studs, runner track, clips, etc. shall be the product of the same manufacturer.

B. Comply with the minimum requirements of the following except where more stringent requirements are specified herein. All gypsum wallboard shall be asbestos free.

1. Gypsum Wallboard: ASTM C-36.

2. Joint Treatment: ASTM C-475.

3. Non-load bearing steel studs, runners, and rigid furring channels for screw attachment of gypsum wallboard: ASTM C-645.

C. Perform work in accordance with ASTM C754, ASTM C840, GA-201 and GA-216.

D. Maintain copies of GA-201 and GA-216 documents on site.

E. When fire-resistive construction is detailed or noted on the Contract Drawings, perform work in accordance with GA-600.

1.05 QUALIFICATIONS

A. Erector Qualifications: Company specializing in the erection of metal stud framing and gypsum wallboard systems on at least three (3) acceptable projects equal in scope to work specified.

1.06 SUBMITTALS

A. Shop Drawings, Product Data and Samples: Shall be submitted in accordance with Division 1.

B. Shop Drawings: Indicate all special details associated with fireproofing, acoustical seals, and ceiling and bulkhead framing.

C. Product Data: Provide manufacturer’s descriptive literature on metal framing, gypsum board, joint tape, and installation instructions and procedures.

D. Manufacturer’s verification that gypsum wallboard contains 100% post-consumer and post-industrial recycled content.

E. Manufacturer’s verification that VOC content of interior sealants is less than 250 g/L.

F. Manufacturer’s verification that VOC content of gypsum wallboard adhesive is less than 50 g/L.

G. Manufacturer’s verification that steel studs and framing contain at least 35% combined post-consumer and post-industrial recycled content.

I. Samples:

1. Submit samples for the Architect's approval in accordance with the applicable provisions of the contract documents.

2. Submit three (3) samples of each of the following:

a. Gypsum wallboard: 12" by 12" each type and finish.

b. Trim: 6" lengths of each type and finish.

c. Compound: 1 pint cans.

d. Tape: 12" lengths.

e. Screws and fastenings: Each size and type.

f. Submit shop drawings and engineering calculations for special areas as requested by the Architect.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver all materials in unopened, original containers bearing manufacturer's labels. Store materials in a clean, dry, protected place and do not leave exposed to weather. Handle all materials with proper care to prevent damage. Handle and protect all materials and metal accessories from damage, dampness or wetting.

B. Remove all items delivered in broken, damaged, rusted or unlabeled condition from site immediately.

C. Storage:

1. Store all materials inside under cover, providing protection from damage and exposure to the elements, stacked flat, and off-floor.

2. Stack wallboard so that lengths are not over short lengths, avoid overloading floor system.

3. Store adhesives and ready-mixed joint compound in dry area; provide protection against freezing at all times.

4. Damaged, frozen, and deteriorated materials shall be removed from the job site.

1.08 JOB CONDITIONS

A. Environmental Conditions:

1. Temperature: During cold weather, in areas receiving wallboard installation and joint finishing, maintain temperature range between 55 degrees to 70 degrees F (13 degrees C to 21 degrees C) for 24 hours before, during, and after gypsum wallboard and joint treatment applications.

B. Ventilation:

1. Provide adequate ventilation to carry off excess moisture during and following adhesive and joint compound treatment applications.

2. Use temporary air circulators in enclosed areas lacking natural ventilation. Under slow drying conditions, allow additional drying time between coats of joint treatment.

3. Protect installed materials from drafts during hot, dry weather.

4. Protection: Protect adjacent surfaces against damage and stains.

PART 2 - PRODUCTS

2.01 METAL FRAMING MATERIALS

A. Provide metal wall and bulkhead framing materials in accordance with GA 216.

B. Metal Studs - Drywall Type: ASTM C645: non-load bearing, galvanized sheet steel, ASTM A525; Cee-shaped, size as indicated, conforming to the following:

1. Rated/non-rated, non-bearing metal stud partitions with single/double layer drywall: 20 gauge (up to 11 feet-6 inches in height; 18 gauge over 11’-6” in height.

2. Rated/non-rated, load bearing metal stud partition with single/double layer drywall: 20 gauge.

3. Ceiling and Wall Furring Channels: 1-3/8" face x 7/8" deep as manufactured by U.S. Gypsum or approved equal. "Z" furring channels, 26 gauge hot dipped galvanized, 1-1/2" deep as manufactured by U.S. Gypsum or approved equal.

4. Metal stud partitions with gypsum board/cement backerboard and ceramic tile finish: 20 gauge or heavier.

5. Metal stud framing at hollow metal door and light openings: 20 gauge.

6. Metal studs for infill framing at renovation/alteration areas: 25 gauge. Runners: Of same material and thickness as studs, bent

leg retainer notched to receive studs.

C. Ceiling Runner: Where required, provide with extended leg retainer. Furring, Bridging and Bracing: Of same material as studs; thickness to suit purpose. Sheet Metal Backing: 20 gauge thickness, galvanized steel.

D. Fasteners: GA-216.

E. Touch-Up Primer for Galvanized Surfaces: SSPC SP 20, zinc rich.

F. Anchorage to Substrate: Tie wire, screws, nails and other metal supports, of type and size to suit application; to rigidly secure materials in place.

2.02 CEILING FRAMING

A. Channels: Fabricated of 16 gauge (1.5 mm) cold-rolled steel, factory applied black asphaltum rust-resistant paint. Minimum weight per 1,000 lineal feet:

1. Depth: 2 inches, 590 lbs.
2. Depth: 1 1/2-inches, 300 lbs.

B. Furring Channels: Screw-type, hat-shaped, 25 gauge (0.5 mm)

C. Optional Framing: Metal stud, ASTM C645 and GA 216, galvanized sheet steel, screw-type, Cee-shaped, minimum 25 gauge.

D. Ceiling Hangers: Minimum 8 gauge, galvanized, annealed steel wire.

E. Tie Wire: 16 gauge, galvanized, annealed steel wire.

F. Anchorage to Substrate: Tie wire, screws, nails and other metal supports, of type and size to suit application; to rigidly secure materials in place.

2.03 SUSPENDED GYPSUM BOARD CEILING GRID SYSTEM

A. Type: Tee grid, ASTM C635.

1. Structural Classification: Heavy-duty system.

2. Main and Cross Members:

a. Web Design: Double-web construction, 1 1/2-inches high with rectangular top bulb.

b. Material: Cold-rolled steel, minimum .0179” thickness prior to protective coating, hot-dipped galvanized, minimum G40 per ASTM C645.

c. Flange: 1 1/2-inch (38mm) width, knurled flange.

d. When fire rated ceilings are required, main beams shall be

formed to include integral design for expansion relief.

3. Design: Designed specifically for suspended drywall ceiling systems as manufactured by *Armstrong, USG, Chicago Metallic,* or equal.

2.04 MANUFACTURERS – GYPSUM BOARD

A. Subject to compliance with requirements, provide products by one of the following:

1. *United States Gypsum Co. (USG)*

2. *Gold Bond Building Products*

3. *Lafarge*

4. *Georgia-Pacific Co.*

2.05 GYPSUM BOARD MATERIALS

A. Gypsum Wall board Types:

1. **Type I**: All rated and non-rated interior gypsum board partitions in toilet rooms, kitchens, serving areas, and other wet or moist areas shall receive **5/8″ thick Mold Tough AR (Abuse Resistant) Firecode Gypsum Wall board.** Gypsum panels shall be composed of a fire resistant, moisture and mold resistant core with 100-percent recycled green face and brown back papers. The face paper is folded around the long edges to reinforce and protect the core, and the ends are square cut and finished smooth. Long edges of panels are tapered, allowing joints to be reinforced and concealed. Sheetrock Mold Tough AR panels are designed and tested to offer greater resistance to surface indentation and impact damage than standard gypsum wallboard materials. As manufactured by U.S. Gypsum or approved equal.

2. **Type II**: All wall surfaces scheduled to receive wall tile finishes shall receive **5/8″ thick Firecode Core Type 'X' Glass-Mat Tile Backerboard** for a suitable wall finish substrate in lieu of the scheduled partition sheathing. Gypsum panels shall be moisture and mold-resistant with a treated water-resistant gypsum core covered with a coated fiberglass mat facer and back with square edges. As manufactured by U.S. Gypsum or approved equal.

3. **Type III:** Non-rated ceilings and soffits shall **receive regular core 1/2″ thick Gypsum panels** composed of a fire resistant gypsum core encased in a heavy natural-finish face paper and strong liner paper on the back side. The face paper is folded around the long edges to reinforce and protect the core, and the ends are square cut and finished smooth. Long edges of panels are tapered, allowing joints to be reinforced and

concealed. As manufactured by U.S. Gypsum or approved equal. For any rated ceilings and soffits, use and refer to Gypsum Board Type II.

Similar manufacturers shall be: Georgia Pacific, National Pacific, or approved equal. The paragraphs below identify specific characteristics of gypsum wallboard materials; actual types of material to be used shall be as indicated or noted on Contract Drawings.

1. Surface Burning Characteristics: When listed in accordance with ASTM E 84 requirements.

   a. Flame Spread Index: 15 maximum.

   b. Smoke Development: 5 maximum.

B. UL Classification: This product is classified by UL as to fire resistance, and meets the requirement for Type X in the model building code.

C. Product Details:

1. Thickness: 5/8-inch (16 mm) thickness unless otherwise indicated; 2.8 lbs./sf.

2. Width: 4 feet.

3. Length: 8 feet through 12 feet; use maximum permissible length.

4. Edges: Tapered long edges and square cut ends.

5. Labeling: Each 5/8" *Firecode* Core panel shall bear the Underwriter's Laboratories, Inc. mark as evidence of UL Classifications for fire resistance, surface burning characteristics and non-combustibility.

D. Limitations:

1. Do not expose to sustained temperatures exceeding 125^{O}F.

2. Do not expose to excessive, repetitive or continuous moisture before, during or after installation. Eliminate sources of moisture immediately.

3. Not suitable for use in high-moisture areas such as tub and shower enclosures, gang showers and other areas subject to direct water exposure.

4. Non-loadbearing.

5. For abuse-resistant construction over steel framing, minimum 20-gauge studs at a maximum of 16" on center are required.

6. Application of Sheetrock Mold Tough AR gypsum panels over insulating blanket, installed continuously across the framing members is not recommended. Blankets should be recessed and

blanket flanges attached to sides of studs or joists.

E. Finishing and Decorating:

1. Painting products and systems should be used that comply with recommendations and requirements in Appendices of ASTM C-840. For priming and decorating with paint, texture or wall covering, follow those manufacturer's directions for materials used.

2. All surfaces, including applied joint compound, must be thoroughly dry, dust-free and not glossy. Prime with *Sheetrock* brand First Coat primer, or with an undiluted, interior latex flat paint with high-solids content. Allow to dry thoroughly before decorating.

3. To improve fastener concealment, where gypsum panel walls and ceilings will be subjected to severe artificial or natural side lighting and be decorated with a gloss paint (eggshell, semi-gloss or gloss), the gypsum panel surface should be skim-coated with joint compound. This equalizes suction and texture differences between the drywall face paper and the finished joint compound before painting. As an alternative to skim coating, or when a Level 5 finish is required, use manufacturer's *Tuff Hide* primer-surfacer.

G. Moisture and Mold Resistance:

1. Per ASTM C473, the average water absorption for panels is not greater than five percent (5%) by weight after a two-hour immersion.

2. In independent lab tests conducted on 5/8" *Sheetrock Mold Tough AR* panels at the time of manufacture per ASTM D3272, *"Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber"*, the panel score was 10.

3. This ASTM lab test may not accurately represent the mold performance of building materials in actual use. Given unsuitable project conditions during storage, installation, or after completion, any building material can be overwhelmed by mold. To manage the growth of mold, the best and most cost-effective strategy is to protect building products from water exposure during storage and installation and after completion of the building. This can be accomplished b y utilizing good design and construction practices; the Contractor is fully and solely responsible for protection of all materials, and replacement of all damaged materials at his own cost.

H. Abuse Resistance:

4. Surface Abrasion: Tested in accordance with ASTM C1629, Level 2.

5. Surface Indentation: Tested in accordance with ASTM C1629, Level 2.

6. Soft Body Impact Test: Tested in accordance with ASTM C1629, Level 1.

I. Fire Protection:

1. 5/8" panels are UL Classified. Provide one- and two-hour Fire Ratings when used in accordance with UL designs U420, U442, U445, U451, U465, U466, U467 and U468. The gypsum core meets requirements for noncombustible construction.

J. ***Hi-Impact 2000 Gypsum Board*** (Regular and Type X): Gypsum core encased in heavy natural-finish paper on face side, and strong liner paper on the back side. Lexan film is bonded to back side to provide additional impact/penetration resistance. Long edges to be tapered to allow joints to be reinforced and concealed, conforming with ASTM C-36; and Fed. Spec. SS-L-30D.

1. Thickness: 5/8-inch thickness unless otherwise indicated.

2. Width: 4 feet.

3. Length: 8 feet; use maximum permissible length.

4. Edges: Tapered long edges and square cut ends.

2.06 GYPSUM BOARD ACCESSORIES

A. Provide gypsum wallboard accessories in accordance with GA 216.

B. Each interior sealant and adhesive product must meet the VOC limits specified in Section 01352 "*LEED Requirements*".

C. Fasteners: Screws ASTM C1002, self-drilling, self-tapping, Bugle Head, for use with power driven tool.

1. Type "S": for wallboard application to sheet metal framing

2. Type "W": for wallboard application to wood framing.

3. Length:

   a. 1 inch (25 mm) for single layer construction.

   b. 1 5/8-inches (41 mm) for double layer construction.

4. For Fire Rated Construction: Same type and size as used in fire rating test.

5. For Other Applications: Type and size as recommended by gypsum board manufacturer.

D. Metal Trim Accessories: Size required for thickness of wallboard used, fabricated from galvanized steel and roll-formed zinc, or other corrosion-resistant treatment. All metal trim shall be 25 gauge, manufactured by *U.S. Gypsum* under the following numbers or approved equal:

1. Corner Beads: Formed galvanized steel angle, 1/8-inch round bead, 1-1/4-inch perforated metal flanges, ASTM C1047, similar or equal to *"Dura-Bead"*.

2. Edge Trim: Formed galvanized steel casing bead, 0.014-inch thick base steel, face nailed, reveal bead and exposed metal flange surface finished with joint compound, ASTM C1047.

3. Control Joints: Manufacturer's standard roll-formed zinc with 1/4-inch; "V"-shaped slot protected by plastic tape, for face

application, exposed flange surfaces finished with joint compound, ASTM C1047; similar or equal to No. 093.

4. Casings: No. 400.

5. Wall to Wall (corner) Expansion Joints: *Wabo ECC-200* corner coverplate, aluminum alloy 6063-TS or 6061-T6, mill finish. Paint as per Section 09900.

E. Joint Treatment Materials:

1. Joint Tape: ASTM C475; paper reinforcing tape, perforated.

2. Joint Compound: ASTM C475; drying type pre-mixed vinyl base compounds, as manufactured by the approved manufacturer of the gypsum board.

3. Laminating Adhesive: Manufacturer's recommended laminating adhesive or liquid contact adhesive for double-layer systems.

F. Adhesive: Similar or equal to USG Durabond 90.

G. Adhesive VOC content must be less than 50 g/L.

H. Special Architectural Metal Drywall Profiles: Furnish and install, where indicated on Contract Drawings, extruded and roll-formed Architectural profiles *"Softforms"* as manufactured by *Pitcon Industries, Inc.*, Riverdale, MD. Subject to compliance with requirements, provide the named product or a comparable product.

1. Designs:

a. Corners: Custom Inside Corner, *Model #SI-LRt*, 6-inch inside radius by 90 degrees.

b. Reveals: Wall Reveal, Model #SWR-200-050, 2-inch wide by 15/32-inch deep.

c. Grooves: V-Groove, Model #SWR-100V-050, 1-inch wide by 45 degrees.

2. Material: Extrusions shall be of 6063 T5 aluminum alloy, and roll formed shapes shall be of 3003 H-14 aluminum alloy.

3. Construction: Profile shall incorporate continuous integral tapering fins for surface contact, 7/8-inch wide. Fins shall be punched with ¼-inch holes staggered ½-inch o.c. to accept standard screw fastening.

4. Finish: Profiles shall receive a factory-applied, high porosity, corrosion-resistant primer compatible with materials commonly in use in conjunction with commercial interiors, i.e. - joint compound, latex or enamel paints, and wall covering adhesives.

2.07 ACOUSTICAL ACCESSORIES

A. Sound Attenuation Fire Blankets:

1. Manufactured from slag wool fiber.

2. Unfaced batts in manufacturers' standard thickness to fit cavity in compliance with manufacturers Sound and Fire-Rated SAFB Assemblies.

3. Length: 48 inches.

4. Batts shall have a density of 2.5 lbs. per cu.ft.

5. R-Value, per 1-inch thickness: 3.7.

6. Flame Spread and Smoke Developed (ASTM E84, Surface Burning Characteristics): 0.

B. Basis-of-Design Product: The design for Slag Wool Fiber is based on *USG Thermafiber, Sound Attenuation Fire Blankets* (SAFB). Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

1. *Owens Corning.*
2. *Fibrex Insulations, Inc.*

C. Acoustical Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board; type as recommended by gypsum manufacturer.

PART 3- EXECUTION

3.01 EXAMINATION

A. Verify that site conditions are ready to receive work and opening dimensions are as indicated on Contract Drawings and approved shop drawings.

3.02 METAL STUD INSTALLATION - GENERAL

A. Install metal stud framing in accordance with manufacturer's instructions, and ASTM C754, except as otherwise specified herein.

B. Install members true to lines and levels to provide surface flatness with maximum variation of 1/8-inch in 10 feet in any direction.

C. Align all partitions accurately according to layout. Runners shall be attached to concrete slab or other type of floor 24 inches on center with concrete stub nails or power-driven anchors, to suspended ceilings with toggle bolts, or to slab above where indicated.

D. Position studs vertically in runners, spaced 16 inches on center

maximum.

E. Anchor all studs adjacent to door frames and at partition intersections and corners, to runner flanges with metal lock fasteners, or positive screw engagement through each stud and runner flange.

F. When necessary, studs shall be spliced by nesting 2 studs with a minimum lap of 8 inches, attaching flanges with 2 screws per flange.

G. Provide horizontal bracing of studs at mid-point in partition height. Bracing shall be standard metal stud cut to fit and secured to studs.

H. Metal studs at door frames shall be erected 2" maximum from frames and as follows:

1. Anchor door frame clips to studs securely by bolt or screw attachment.

2. Doors 2'-6" and wider shall be framed with double studs, placed back to back.

3. Over door frames, install a section (cut to length) of runner with slip flanges and bent web to allow flanges to overlap adjacent vertical studs; screw attach all components.

4. Position a stud at the locations of vertical joints in wallboard over door frames. Stud shall extend from frame header to the ceiling runner.

I. Unless otherwise indicated or specified, the suspension system for gypsum board ceilings and soffits shall consist of runner channels and furring channels, suspended by hanger bars or hanger rods.

3.03 INSTALLATION OF FLOOR AND CEILING TRACKS

A. Align floor and ceiling tracks.

B. Attach metal runners at floor and ceiling to structural elements with appropriate power-driven fasteners.

C. Attach tracks to structure with fasteners located 2 inches from each end and spaced at a maximum of 24 inches on center.

D. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.

3.04 INSTALLATION OF METAL STUD

A. Plumb and align studs.

B. Space studs at 16 inches on center, unless otherwise indicated.

C. Attach studs to floor and ceiling tracks by crimping flange of runner track, screwing, tack welding or method as recommended by stud manufacturer.

D. If necessary, splice studs by nesting with minimum lap of 8 inches.

E. Refer to Contract Drawings for indication of partitions extending to finished ceiling only, and for partitions extending through the ceiling to the structure above.

3.04 INSTALLATION OF FRAMING AROUND DOORS AND LIGHT OPENINGS

A. Install double studs at each jamb of door, continuous for full height of partition.

B. Attach stud track horizontally on each side of opening, at frame head height.

1. Install jack studs at 16 inches on centers over head of door frame.

2. Attach jack studs to runner track and anchor top in same manner as provided for full studs.

3. Screw, bolt or weld stud to jamb anchors of frame, as recommended by stud manufacturer.

4. Anchor a second stud to stud at doorjamb, as recommended in manufacturer's printed instructions, nested to form a box.

5. Provide headers above and below framed wall openings having an area of 2 square feet or more.

3.05 CORNERS AND INTERSECTIONS

A. Form corners and intersection of partitions with three studs as detailed in ASTM C754, Fig. 2 and Fig.3, as detailed on drawings. Two stud corner construction is not acceptable.

B. Place studs forming internal corners 2 inches (50 mm) from point of partition intersections.

3.06 BLOCKING

A. Bolt or screw steel channels to studs. Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware, and other similar items.

3.07 INSTALLATION – WALL FURRING

A. Attach wall furring for direct attachment to concrete block and/or concrete walls.

B. Erect furring channels horizontally or vertically; space maximum

16" (400 mm) on center, not more than 4 inches (100 mm) from floor and ceiling lines or abutting walls. Secure in place on alternate channel flanges at maximum 24" on center.

C. Where furring channels are installed directly to exterior walls and a possibility of moisture penetration through walls exists, install asphalt felt paper protection strip between the channel and wall.

3.08 INSTALLATION – CEILING FRAMING

A. Space 8 gauge hanger wire 48" on centers along carrying channels and within 6" of ends of channel run.

B. Install carrying channels 48" on centers and within 6" of walls.

C. Position channels for proper ceiling height, level, and secure with hanger wire saddle-tied along channel.

D. Interlock flanges, at channel splices, and overlap ends 12" and secure each end with double-strand 18 gauge tie wire.

E. Erect metal furring channels at right angles to carrying channels or support members. Space furring channels 16” o.c. and within 6" of walls.

F. Secure furring to carrying channels with clips or saddle-tie with double-strand 16 gauge tie wire.

G. Nest furring channels at least 8" at splices, and securely wire-tie each end with double-strand 18 gauge tie wire.

3.09 INSTALLATION – SUSPENDED CEILING GRID SYSTEM

A. Install fire rated ceiling system(s), when indicated, in accordance with applicable UL Design requirements.

B. Install in accordance with ASTM C636 and manufacturer's recommendations to produce finished ceiling true to lines and levels and free from warped, soiled or damaged grid.

C. Install ceiling system(s) in a manner capable of supporting all superimposed loads, with maximum permissible deflection of 1/360 of span and maximum surface deviation of 1/8” in 12 ft.

D. Rough Suspension:

1. Hanger Clips on Inserts: Install as recommended by manufacturer.
2. Hanger Wire: Space 4 ft. on center, each direction.
3. Do not splay wires more than 5” in a 4 ft. vertical drop.
4. Wrap wire a minimum of three times horizontally, turning ends upward.

5. Saddle tie carrying channels to main structure for indirect hung suspension system, as appropriate.
6. Provide extra wire hangers at light fixtures, grilles, access doors as required.

E. Main and Cross Runners:

1. Space main runners at 4 ft. on center, in direction of lighting pattern.

a. At right angle to carrying channel, wire clip to channels at intersections, if indirect suspension is required.

b. Level and square to adjacent walls.

2. Space cross runners at 2 ft. on center.

3. Suspend grid system(s) independently of walls, columns, ducts, lighting fixtures, pipes and conduit.

F. Channel Molding:

1. Install wall channel molding at intersection of suspended drywall ceilings and vertical surfaces.

2. Attach vertical surface to wall with mechanical fasteners, using maximum lengths; straight, true-to-line, and level.

3.10 FURRING FOR FIRE RATINGS

A. Install furring for fire resistance ratings in accordance with appropriate UL requirements and/or Design Numbers indicated.

3.11 INSPECTION PRIOR TO WALLBOARD INSTALLATION

A. Check framing for adequate spacing and alignment.

B. Verify that spacing of installed framing does not exceed maximum allowable for thickness of wallboard to be used.

C. Verify that frames are set for thickness of wallboard to be used.

D. Do not proceed with installation of wallboard until deficiencies are corrected and surface to receive wallboard are acceptable.

E. Protrusions of framing, twisted framing members, or unaligned members must be repaired before installation of wallboard is started.

F. Commencing installation of wallboard means “acceptance” of existing conditions.

3.12 WALLBOARD INSTALLATION - GENERAL

A. Unless otherwise specified, methods of installation shall be in accordance with the requirements of the Gypsum Association (GA-201, GA-216) and the approved manufacturer’s instructions..

B. Stockpile wallboard, flat on floor in piles. Leave in original wrappings or containers until ready for use. Protect wallboard from moisture from any source.

C. Butt all wallboard joints loosely together with a 1/4" cap. Butt ends shall not be placed against tapered edges.

D. Install in maximum practical lengths to span walls without butt joints. If butt joints do occur, stagger joints and locate as far as possible from center of walls or ceilings.

E. Abut wallboard without forcing. Neatly fit ends and edges of wallboard. Do not place butt ends against tapered edges.

F. Support end joints on studs. Apply end joint compound to the back of the board along end joints.

G. No end joints shall align with edges of openings. Install expansion and/or control joints where shown or required.

H. Install metal trim at corners, edges, and elsewhere as shown in accordance with the manufacturer's instructions and recommendations.

I. Openings cut in wallboard to fit mechanical and electrical items shall fit snugly and be small enough to be covered by escutcheons and plates. Both face and back paper shall be cut when cutouts are not made with a saw.

J. Adhesive and joint finishing compounds shall be mixed in strict accordance with the manufacturer's instructions. Mix only enough at one time to be used during the recommended pot life of the compound.

K. Fasteners shall be installed as follows:

1. Install no closer than 3/8-inch to end or edge.

2. Begin from center of wallboard and proceed to outer edge.

3. Pressure shall be applied on wallboard adjacent to fasteners being driven to ensure a tight fit of wallboard to the studs.

L. Drive screws with a power screw driver as recommended by the manufacturer. Surface of head shall finish below the surface of the paper without puncturing the paper.

M. Minimum temperature in areas where gypsum board is to be installed

shall be 65°F for 24 hours before, during, and after installation. Provide adequate heat and ventilation to remove any moisture.

N. Install continuous sound absorbing blanket in partitions indicated on drawings. Installation shall be in accordance with manufacturer's directions. Sound absorbing blanket insulation shall be paperless, semi-rigid mineral fiber batts 1" thick "Thermafiber" sound attenuation blanket, flame spread rating of 15 (ASTM E-84) as manufactured by U.S. Gypsum or approved equal.

3.13 INSTALLATION - WALLBOARD OVER FRAMING

A. Single Layer Construction:

1. Ceilings:

a. Gypsum wallboard shall be applied first to ceiling with long dimension at right angles to framing using panels of maximum practical length.

b. Position end joints over framing members and stagger in adjacent rows.

c. Fit ends and edges closely, do not force together. Fasten panels to furring with mechanical fasteners, spaced 12” o.c., in field of panels and along abutting ends and edges.

2. Walls:

a. Apply wallboard horizontally for wall height of 8’-0” or less, and vertically for wall height greater than 8’-0”. When installing wallboard horizontally, attach upper panel first.

b. Apply single layer fire rated wallboard vertically, with edges occurring over firm bearing.

c. Stagger end joints to occur on different framing members on opposite sides of partition.

3. Mechanical Fastening:

a. Screws:

1) Attach single layer of wallboard to metal framing with power driven screws.

2) Minimum edge clearance from mechanical fastener: 3/8”.

3) Stagger mechanical fasteners opposite each other on adjacent ends and edges.

4) Sand abutting ends or edges over support surface.

5) Space screws 16” o.c. when framing is spaced 16” o.c., or 12” o.c. when framing is spaced 24” o.c.

6) Drive screws with a positive clutch electric screwgun.

B. Double Layer Construction:

1. Ceilings:

a. Apply wallboard face layer perpendicular to edges of base layer.

b. Position end joints of face layer to offset base layer joints by at least 10”.

c. Gypsum wallboard shall be installed in such a manner to provide two-hour fire resistant rating shown, when indicated, and in accordance with requirements of UL.

2. Walls:

a. Apply wallboard base layer vertically.

b. Stagger vertical joints of base layer on opposite side of partition to occur on different framing members.

c. Apply face layer horizontally, minimum offset of joints between face layer and face layer shall be at least 10".

d. Gypsum wallboard shall be installed in such manner to provide two hour fire resistant ratings indicated, and in accordance with requirements of UL.

3. Adhesive Lamination:

a. Apply adhesive with notched spreader or caulking gun, as recommended by wallboard manufacturer, for this particular application and job condition.

4. Permanent Attachment:

a. Permanently attach face layer with specified fasteners in accordance with UL requirements for systems selected.

3.14 CONTROL JOINTS

A. Non-Rated Gypsum Construction: Gypsum panel surfaces shall be isolated with control joints or other means, as detailed and at locations indicated on the drawings, if not shown, where:

1. Partition, furring or column fireproofing abuts a structural element (except floor) or dissimilar wall or ceiling;

2. Ceiling or soffit abuts a structural element, dissimilar wall or partition or other vertical penetration;
3. Construction changes within plane of partition or ceiling;
4. Partition or furring run exceeds 30 ft.;
5. Ceiling dimensions exceed 50 ft. in either direction with perimeter relief, 30 ft. without relief;
6. Exterior soffits exceed 30' in either direction;
7. Wings of "L", "U" and "T" shaped ceiling areas are joined;
8. Expansion or control joints occur in the exterior wall.
9. Less-than-ceiling height door/light frames shall have control joints extending to the ceiling from both opening corners. Ceiling height doorframes may be used as control joints.

B. Fire-Rated Gypsum Construction: Gypsum panel surfaces shall be isolated with control joints or other means, as detailed and at locations indicated on the drawings, if not shown, where:

1. A partition, wall, or ceiling traverses a construction joint (expansion, seismic, or building control element) in the base building structure.

2. Where a wall or partition runs in an uninterrupted straight plane exceeding 30 lineal feet. NOTE: Full height door frames may be considered a control joint.

3. Interior Ceilings With Perimeter Relief: Control joints shall be installed so that linear dimensions between control joints shall not exceed 50 ft. and total areas between control joint shall not exceed 2500 sq.ft.

4. Interior Ceilings Without Perimeter Relief: Control joints shall be installed so that linear dimensions between control joints shall not exceed 30 ft. and total areas between control joint shall not exceed 900 sq.ft.

5. Exterior Ceilings and Soffits: Control joints shall be installed so that linear dimensions between control joints shall not exceed 30 ft. and total area between control joints shall not exceed 900 sq.ft.

6. A control joint or intermediate blocking shall be installed where ceiling framing members change direction.

7. A control joint is desired or incorporated as a design accent or Architectural feature.

3.15 INSTALLATION – ACOUSTICAL ACCESSORIES

A. Place acoustical insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.

B. Apply acoustical sealant within partitions in accordance with

manufacturer's instructions and recommended procedures.

3.16 INSTALLATION – METAL ACCESSORIES

A. Install corner beads and edge trim as specified in ASTM C840.

B. Install corner beads at all external corners.

C. Install edge trim at perimeter of openings and at juncture with other materials except, where covered by casings or flanges.

3.17 JOINT TREATMENT SYSTEM

A. Execute joint treatment in accordance with the manufacturer's printed instructions and these specifications.

B. Reinforce wall corners and angles with tape folded to conform to the contour and embed in compound.

C. Flanges of corner beads and trim shall be concealed by 2 coats of compound. Feather cut compound 9 inches from beads.

D. Sand compound when thoroughly dry; avoid roughing surfaces of finish wallboard.

E. Leave all surfaces smooth and uniform, ready to receive paint.

F. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840.

1. Level 4.

G. Taping and Finishing Joints:

1. Taping and Embedding Joints:

a. Apply compound in thin uniform layers to all joints and angles to be reinforced.
b. Apply reinforcing tape immediately.
c. Center tape over joint, and seat tape into compound.
d. Leave approx. 1/64" to 1/32" compound under tape to provide bond.
e. Apply skim coat immediately following tape embedment, but not to function as fill or second coat.
f. Fold tape and embed in at inside corners to provide true angle.
g. Allow embedding coat to thoroughly dry prior to application of fill coat.

2. Filling:

a. Apply second coat of joint compound over embedding coat.
b. Fill taper flush with surface.

c. Apply fill coat to cover embedding coat.
d. Feather out fill coat beyond embedding coat and previous joint compound line.
e. Joints with no taper: Feather out at least 4" on either side of tape.
f. Do not apply fill coat on interior angles.
g. Allow fill coat to thoroughly dry prior to application of finish coat.

3. Finishing:

a. Spread joint compound evenly over and beyond fill coat on all joints.
b. Feather coats onto adjoining surfaces so that camber is maximum 1/32" to 1/16"., and to a smooth, uniform finish.
c. Apply finish coat to taped inside angles to cover tape and taping compound.
d. Sand final application of compound to provide a smooth surface, ready for decoration.

G. Filling and Finishing Depressions:

1. Apply joint compound as first coat to fastener and other depressions.
2. Apply at least two additional coats of compound after first coat is dry.
3. Leave filled and finished depressions level with plane of surface.

H. Finish Beads and Trim:

1. First Fill Coat:

a. Apply joint compound to beam and trim.
b. Feather out first coat from ground to plane of wallboard surface.
c. Allow compound to thoroughly dry prior to application of second fill coat.

2. Second Fill Coat:

a. Apply joint compound in same manner as first coat.
b. Extend beyond first coat onto face of wallboard.
c. Allow compound to thoroughly dry prior to application of finish coat.

3. Finish Coat:

a. Apply joint compound in same manner as second coat.
b. Extend beyond second fill coat.
c. Feather out finish coat from ground to plane of wallboard surface.
d. Sand finish coat to provide a flat surface ready for

decoration.

4. Taping, filling and sanding is not required at surfaces behind adhesive applied ceramic tile.

3.18 AIRTIGHT DRYWALL OR RETURN AIR PLENUM SPACES

A. Finish all drywall plenum construction below access floor or above finished ceiling.

1. Finish Level: Level 1.

a. Seal all pipes, ducts, conduit and other penetrations.
b. Seal perimeter of all drywall to floors and deck above with sealant.

3.19 INSTALLATION OF ACCESS PANELS

A. Install metal access panels and rigidly secure in place, as required by other sections and other trades.

B. Install in accordance with manufacturer's printed instructions and requirements of regulatory agencies, when applicable.

C. Coordinate the installation of rough bucks, anchors, blocking, mechanical and electrical work which is to be placed in or behind wall framing and ceiling furring. Allow such items to be installed after framing and furring is complete.

3.20 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8” in 10 feet, in any direction.

3.21 PATCHING AND REPAIRING

A. After trim is applied, correct all surface damage and defects as required, to the Architect's satisfaction, so that blemishes will not show through the decoration.

B. If, in the opinion of the Architect, the wallboard is irreparable, the Contractor shall remove same and replace it with new material at no extra cost to the Owner.

C. Punctures:

1. When face paper is punctured, drive new nail approximately 1 1/2" from defective fastening and remove defective fastener.

2. Fill all damaged surface areas with compound.

3. Leave clear depression to receive tape.

4. Permit prefill joint compound to harden prior to application of tape.

D. Ridging:

1. Do not repair ridging until condition has fully developed; approximately six months after installation of one heating season.

2. Sand ridges to receive reinforcing tape without cutting through tape.

3. Fill concave areas on both sides of ridge with topping compound.

4. After fill is dry, blend in topping compound over repaired areas.

E. Cracks:

1. Fill all cracks with compound, and finish smooth and flush.

3.22 INSPECTION

A. Wall surface, when prepared for painting, shall be inspected and approved by the Architect before proceeding further.

END OF SECTION

DIVISION 9 - FINISHES

SECTION 09510 - ACOUSTIC CEILING SYSTEMS

(2X4 or 2X2 SUSPENDED TILE)

PART 1 - GENERAL

1.01 DESCRIPTION

A. Ceiling Types:

1. The extent of each type of acoustic ceiling is shown on the drawings and in schedules.

2. The types of acoustic ceilings required are as follows:

a. Mineral fiber acoustic panels in exposed grid suspension system.

B. Related Work:

1. Section 09900 - Painting.

C. Related Work in Other Contracts:

1. Heating, Ventilating, and Air Conditioning Work:

a. Grilles, diffusers, and similar air distribution components installed in acoustic ceiling system. Refer to Division 15.

2. Electric Work:

a. Lighting fixtures, smoke detection systems, sound systems, and similar electrical components installed in acoustic ceiling system. Refer to Division 16.

1.02 QUALITY ASSURANCE:

A. Installer Requirements:

1. Acceptable to manufacturer of primary acoustic materials.

1.03 SUBMISSIONS:

A. Submissions shall be in accordance with Section 01300 - Submissions, and as modified below.

B. Product Data:

1. Submit manufacturer's specifications and installation instructions for each acoustic ceiling system required.

C. Samples:

1. Architect's review will be for color and texture only.

Compliance with all other requirements is the exclusive responsibility of the contractor.

2. Submit samples of the following:

a. Exposed grids: Submit three 12" long samples of each type exposed runner.

b. Moldings: Submit three 12" long samples of each type required.

c. Acoustic units: Submit 3 sets of 12" square samples for each different acoustic unit required. Each set of samples shall show the full range of color and texture to be expected in the completed work.

D. Maintenance Instructions:

1. Submit two copies of the manufacturer's recommendations for cleaning and refinishing each type of acoustic unit used in the work. Include precautions against materials and methods which may be detrimental to finishes and acoustic efficiency. Submit to Architect for transmittal to Owner.

E. Replacement Materials:

1. When work is completed, deliver stock of replacement material to Owner for each type of acoustic unit used in the work. Furnish full size units, matching installed materials, package and mark for identification. Obtain receipt; submit copy of receipt for Architect.

2. Furnish not less than 1% of the total amount of each type of acoustic panel unit installed.

1.04 DELIVERY AND STORAGE:

A. Deliver acoustic ceiling materials to the job site in original, unopened packages, bearing manufacturer's name and label identifying each type of acoustic unit.

B. Storage Areas:

1. Comply with acoustic material manufacturer's recommendations for storage of units to be used in the work.

1.05 PROJECT/SITE CONDITIONS:

A. Environmental Requirements:

1. Do not install ceiling panels until building is closed in and HVAC system is operational.

2. Locate materials onsite at least 24 hours before beginning

installation to allow materials to reach temperature and moisture equilibrium.

3. Maintain the following conditions in areas where acoustical materials are to be installed 24 hours before, during and after installation:

a. Relative Humidity: 65-75%
b. Uniform Temperature: 55-70°F (13-21°C).

PART 2 - PRODUCTS

2.01 SUSPENSION SYSTEMS:

A. Quality Standard:

1. Provide direct hung suspension system complying with ASTM C 635 for the following structural classifications:

a. Intermediate duty, unless otherwise indicated.

B. Manufacturers:

1. Provide suspension systems for acoustic ceilings as produced by one of the following:

a. Armstrong World Industries, Lancaster, Pennsylvania.

b. Chicago Metallic Corp., Chicago, Illinois.

c. Donn Corp., Westlake, Ohio.

d. Certainteed Architectural, Malvern, Pennsylvania.

C. Hangers:

1. Provide hangers as recommended by suspension system manufacturer to comply with specified structural classification.

a. If suspension system manufacturer does not indicate hanger recommendation, provide not less than 9 gauge galvanized, soft annealed, mild steel wire.

2. Where hanger wires cannot be directly wire-tied to structural or intermediate framing members, provide attachment devices designed for the type of construction used in the work and with a carrying capacity of not less than 5 times the design loads involved.

D. Edge Moldings:

1. Provide manufacturer's standard angle or channel molding for edges and penetrations of ceiling, with single flange of molding exposed, white baked enamel finish.

E. Exposed Grid Suspension System:

1. Provide Class A fire rated single web steel main runners, matching interlocking cross runners, adapters, and accessories with exposed cross runners coped to lay flush with main runners.

2. Finish: Smooth, matte white baked enamel.

F. Protective Coatings and Finish:

1. Provide manufacturer's standard coatings and finishes for normal use environments (ASTM C 635), except as noted.

2. In toilet rooms, provide protective coatings and finishes complying with High Humidity Test Requirements (ASTM C 635).

2.02 ACOUSTIC CEILING UNITS:

A. Manufacturers:

1. For convenience, details and specifications have been based on products indicated by the following manufacturers:

a. Mineral fiber acoustic panels and tiles: Armstrong World Industries, Lancaster, Pennsylvania.

2. Other manufacturers offering mineral fiber acoustic panels and tiles complying with the requirements include:

a. Certainteed Architectural, Malvern, Pennsylvania.

b. United States Gypsum Co., Chicago, Illinois.

B. Mineral Fiber Acoustic Panels:

1. Provide units, not less than 5/8" thick, with flame spread of 25 or less (ASTM E84) complying with performance requirements and physical characteristics of the specified panels indicated in the construction documents.

2.03 ACCESSORIES:

A. Hold Down Clips:

1. Provide manufacturer's standard spring steel clips spaced as recommended by said manufacturer in the following spaces:

a. All gymnasiums.
b. All recreation rooms.
c. All High School corridors.
d. All Middle School corridors.

PART 3 - EXECUTION

3.01 INSTALLATION OF SUSPENSION SYSTEMS:

A. General:

1. Coordination: Prior to start of acoustic ceiling work, consult other trades and contractors involved to determine areas of potential interference. Do not start installation of suspension systems until interferences have been resolved.

2. Provide framed openings around all sides of openings receiving items set in or attached to ceilings.

3. Install suspension systems in accordance with manufacturer's printed instructions and to comply with the requirements of ASTM C 636.

B. Hangers:

1. Space not more than 6" from each end and not more than 4' o.c. between ends of members to be supported. Provide additional hangers for support of light fixtures and other items to be supported by the ceiling suspension system including clips to securely fasten all framing members (used to support fixtures) to each other to prevent eccentric deflection or rotation of supporting runners.

C. Moldings:

1. Provide edge moldings where ceilings meet walls, partitions, and other vertical elements.

2. Corners: Miter cut inside and outside corners.

D. Runners:

1. Support main runners directly from hangers; do not bear on walls or partitions. Space main runners to support acoustic panels and other work resting in or on the ceiling, as

required to comply with specified performance requirements. Interlock cross-runners with either main runners or with cross-runners structurally classified as main runners. Install moldings with exposed leg in same plane as bottom flange of runners.

E. Where ceiling suspension systems are attached directly to the bottom chord of joists, ceiling extensions (either an extended bottom chord element or a separate unit, to suit manufacturer’s standards, or sufficient strength to support ceiling construction) shall be provided. Extend ends to within 1/2” of finished wall surface unless otherwise indicated.

3.02 INSTALLATION OF ACOUSTIC CEILING UNITS:

A. General:

1. Do not install acoustic ceilings until installation areas meet the following requirements:

a. Exterior openings have been closed and roofs are weathertight.

b. Mechanical, electrical, and other work above ceilings has been completed.

c. Wet work has been installed.

d. Temperature and relative humidity have reached levels which comply with acoustic material manufacturer's recommendations for the units to be used in the work and are acceptable to the installer.

2. Install materials in accordance with manufacturer's printed instructions and other recommendations applicable to the work.

3. Balance border areas to avoid units of less than 1/2 unit width wherever possible. Wherever ceiling area is a multiple of full size acoustic units used in the work, balance alignment to be square and true and install only full size units for entire ceiling including borders.

B. Installation of Acoustic Panels in Exposed Grid Suspension Systems:

1. Install square edge panels to rest on flanges of grid tees with border units supported by moldings.

a. Field cut border units square and support on wall moldings.

2. Provide hold-down clips for panel areas where indicated; omit clips where access areas are shown.

a. Install 2 clips per panel at center of opposite sides of long dimension.

b. Install 4 clips per panel at midpoint of each side.

3.03 CLEAN UP AND PROTECTION:

A. Clean exposed surfaces of acoustic units and suspension systems; comply with manufacturer's instructions. Remove and replace units and members which are damaged or cannot be cleaned.

END OF SECTION

DIVISION 9 - FINISHES

SECTION 09650 - RESILIENT FLOORING

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Provide new resilient flooring and base where noted on drawings.

1.02 RELATED SECTIONS

A. 03300 – Cast-in-Place Concrete

B. 03511 – Self-Leveling Concrete Floor and Underlayment

C. 03512 – Self-Leveling Concrete Floor Underlayment (Over Extruded Polystyrene Foam)

D. 06100 – Rough Carpentry

1.03 SUBMITTALS

A. Submittals shall be in accordance with Section 01300 - Submittals and as modified below.

B. Product Data:

1. Submit manufacturer's technical data and installation instructions for each type of resilient flooring, adhesives and accessories.

2. Include manufacturer's written instructions for recommended maintenance practices for each type of resilient flooring and accessories.

C. Samples:

1. For projects requiring initial selection of color and pattern by Architect, submit samples in form of actual sections of resilient flooring, including accessories, showing manufacturer's full range of colors and patterns available, for each type of resilient flooring required.

2. For projects requiring verification of previously selected styles and colors; submit, for verification purposes, samples of each type, color, and pattern of resilient flooring, including accessories, selected by Architect, indicating full range of variation in color and pattern selected. Provide full-size tile units and minimum 2 1/2" long sections of resilient flooring accessories.

D. Maintenance Instructions:

1. Submit manufacturer's written instructions for recommended maintenance practices for each type of resilient flooring and accessories.

E. Replacement Material:

1. Submit to Owner at project site one box of each type and color of tile for each 50 boxes (or fraction thereof) of each type and color installed.

1.04 PRODUCT DELIVERY AND STORAGE

A. Deliver materials to project site in manufacturer's original, unopened containers with labels indicating brand names, colors, patterns, and quality designations legible and intact.

B. Do not open containers or remove markings until materials are inspected and accepted by installation contractor.

C. Store and protect accepted materials in accordance with manufacturer's directions and recommendations.

D. Unless otherwise indicated, store materials in original containers at not less than 70°F for not less than 48 hours immediately before installation.

E. All products should be inspected for dye lot, style, color, size, quality and shipping damage prior to installation and should not be installed if any irregularities are observed. Inspect the cartons to be sure all colors are the same shade.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Maintain temperature in space to receive tile between 70°F and 90°F for not less than 48 hours immediately before installation.

B. Maintain minimum temperature of 55°F after flooring is installed except as specified in "A" above.

C. Temperatures provided for installation and initial finishing shall be maintained at levels in accordance with manufacturer’s requirements.

PART 2 - PRODUCTS

2.01 TILE FLOORING

A. Vinyl Composition Tile: (VCT) Azrock by Tarkett or equivalent.

1. Meets ASTM F1066 Class 2 (Through Pattern)

2. Interior Floor Finish Requirements: Interior floor finish shall meet or exceed the requirements of The Building Code of New York State.

a. The flooring specified is classified in accordance with

NFPA 253 as: Class 1, Critical Radiant Flux 0.45 watts/cm2 or greater.

b. Flame spread rating less than 25 and smoked developed not to exceed 450, in accordance with by ASTM E-84.

3. Size: 12" x 12" unless otherwise shown. Thickness: 1/8".

4. Color and pattern: Unless otherwise specified, color shall be as selected by the Architect from manufacturer's full range of standard VCT patterns and colors. Pattern to match existing where appropriate or as shown on finish floor plans. In the event that the finish floor plans in part or in their entirety are not provided herein, the bid shall include a minimum of two and/or three colors in a full tile basic pattern as determined by the Architect.

5. Slip resistance: ADA compliant with a static coefficient of friction of 0.6 for level surfaces and 0.8 for ramps.

6. 150 psi rating.

7. Manufacturers offering products complying with these requirements include:

a. Azrock by Tarkett, Houston, Texas

b. Mannington Commercial; Calhoun, GA.

c. Armstrong Commercial US, Lancaster, PA.

B. Vinyl Enhanced Tile: (VET) Azrock by Tarkett or equivalent

1. Meets ASTM F1066.

2. Interior Floor Finish Requirements: Interior floor finish shall meet or exceed the requirements of The Building Code of New York State.

a. The flooring specified is classified in accordance with NFPA 253 as: Class 1, Critical Radiant Flux 0.45 watts/cm2 or greater.

b. Flame spread rating less than 25 and smoked developed not to exceed 450, in accordance with by ASTM E-84.

3. Size: 12" x 12" unless otherwise shown, 1/8" thick.

4. Color and pattern: Unless otherwise specified, color shall be as selected by the Architect from manufacturer's Azterra, Color Essence, or Color Essence SR series or manufacturer's current full range of standard V.E.T. Pattern to match existing where appropriate or as shown on finish floor plans. In the event that the finish floor plans in part or in their entirety are not provided here, the bid shall include a minimum of two and/or three colors in a full tile basic pattern as determined by the Architect.

5. Slip resistance: ADA Compliant with a static coefficient of friction of 0.6 for level surfaces and 0.8 for ramps.

6. 400 psi rating.

7. Manufacturers offering products complying with these requirements include:

   a. Azrock by Tarkett, Houston, Texas.

   b. Roppe Corporation; Fostoria, Ohio.

C. Homogeneous Solid Vinyl Tile: (SVT) Azrock by Tarkett or equivalent.

1. Meets ASTM F1700, Class 1, Type A (Type B for Slip Resistance).

2. Interior Floor Finish Requirements: Interior floor finish shall meet or exceed the requirements of The Building Code of New York State.

   c. The flooring specified is classified in accordance with NFPA 253 as: Class 1, Critical Radiant Flux 0.45 watts/cm2 or greater.

   d. Flame spread rating less than 25 and smoked developed not to exceed 450, in accordance with by ASTM E-84.

3. Size: 16” x 16” unless otherwise shown, 1/8” thick.

4. Color and pattern: Unless otherwise specified, color shall be as selected by the Architect from manufacturer’s Cortina Grande or Karim Kolors series or manufacturer’s current full range of standard V.E.T. Pattern to match existing where appropriate or as shown on finish floor plans. In the event that the finish floor plans in part or in their entirety are not provided within. Include a minimum of two and/or three colors in a full tile basic pattern as determined by the Architect.

5. Slip resistance: ADA compliant with a static coefficient of friction of 0.6 for level surfaces and 0.8 for ramps.

6. 800 psi rating.

7. Manufacturers offering products complying with these requirements include:

   a. Azrock by Tarkett, Houston, Texas.

   b. Polyflor Ltd., Manchester, UK.

D. Luxury Vinyl Tile (LVT) by Tandus Centiva by Tarkett or equivalent.

1. Meets ASTM Testing as follows:

a. ASTM F137

b. ASTM F2199

c. ASTM F970

d. ASTM F1914

e. ASTM e648

f. ASTM D2047

g. ASTM E662

h. ASTM F1515
i. ASTM F925

j. ASTM F1514

2. Offer a minimum 1500 PSI rating.

3. Available with the following emboss selections: Pathway, Frost, Natural Grain, Fresco, Quarry, Rough Grain, Sawn, Straight Grain and Tick.

4. Offer a variance in size selection.

5. Offer a design selection between wood, stone or abstract products.

6. Offer a minimum wear layer thickness of 32 mil.

7. Offer a 3 mm overall thickness.

8. Offer a 20 year commercial warranty.

2.02 ACCESSORIES

A. Rubber Cove or Wall Base:

1. Rubber cove or wall base shall be extruded and as manufactured by Roppe Corporation. It shall be constructed of first quality materials, properly vulcanized, and shall be smooth and free from imperfections which detract from its appearance. The base shall conform fully to the requirements of U.S. Federal Specification SS-W-40a, Type I Rubber. All cove base shall be of the cove Style B with a height of 4” (101.6 mm), in lengths continuous coil (1.22 m), in the color stated (see No. 4 below), and of 1/8” (3.175 mm) thickness.

2. Height: 4" unless otherwise noted.

3. Thickness: 1/8" gauge.

4. Color: As may be detailed in the finish floor plans or as selected by Architect from the manufacturer’s premium colors.

5. Style: Standard top-set cove, except as may be detailed in finish floor plans or as selected by the Architect.

6. In the event that the finish floor plans in part or in their entirety are not provided herein, for bidding purposes, the Contractor shall utilize and, therefore, for inclusion in the scope of work and contract, that 100 percent of all rubber cove base shown to be provided shall be of Roppe Corporation Premium Colors Group IV or equal.

B. Accessories:

1. The Contractor shall utilize for bidding purposes and, therefore, for inclusion in the scope of work, all transitional reducers, reducer strips, cove caps, thresholds, edging, fillet strips and/or joiners as may need to be required by the project and/or Architect to provide a complete and acceptable project. All accessories shall be rubber and as manufactured by Roppe Corporation Color Group II or equal or luxury vinyl tile moldings to match specified pattern by moldingsonline.com.

C. Adhesives (Cements):

1. Waterproof, stabilized type as recommended by flooring manufacturer for the type of tile to be installed. Asphalt emulsions and other non-waterproof types are not acceptable.

D. Concrete Slab Primer:

1. Non-staining type as recommended by flooring manufacturer.

E. Leveling and Patching Compounds

1. Trowel Grade, featherable, latex modified Portland cement or blended hydraulic cement based formulation acceptable to the flooring manufacturer.

2. Gypsum based compounds shall not be used in slab on grade construction and will only be considered where specifically approved by the flooring manufacturer.

PART 3 - EXECUTION

3.01 INSPECTION OF SURFACES

A. Examine surfaces to receive resilient tile materials before installation begins for:

1. Defects or conditions that would adversely affect quality and execution of installation.

2. Deviations beyond allowable tolerances of surfaces to receive resilient flooring:

a. Maximum variation in sub-floor surfaces: 1/8 inch in

10 feet.

3. Do not proceed with installation until unsatisfactory conditions have been reported in writing to the Architect and have been corrected.

B. Prepare substrates according to ASTM F 710 including the following:

1. Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

a. When slab moisture content is in excess of manufacturer's requirements and if further drying is not possible, it may be necessary to install a moisture vapor barrier such as Chapco's Defender by Fuller Construction Products, Inc. If such a barrier product is determined to be required the product shall be deemed acceptable by the flooring and adhesive manufacturer'. The cost for application for such a barrier if not otherwise specified is considered an additional cost to the project. Added cost shall be agreed prior to proceeding.

b. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.

c. VCT, VET & SVT

1. Perform anhydrous calcium chloride test, ASTM F 1869. Results must not exceed 5 lbs. Moisture Vapor Emission Rate per 1,000 sq. ft. in 24 hours.

Special Note: If MVER is greater than 5 lbs. but less than 8 lbs. consult manufacturer for special adhesive recommendations.

2. Perform relative humidity test using in situ probes, ASTM F 2170. Results must not exceed 80%.

Special Note: If MVER is greater than 80% but less than 90% consult manufacturer for special adhesive recommendations.

b. LVT

1. ASTM F1869 and ASTM F2170 and pH testing is required when installing LVT. Testing should be performed in several areas including the perimeter of the room, at columns and wherever else moisture might occur. The maximum allowable moisture vapor emission rate (MVER) from the subfloor is 6.0 lbs. The maximum pH range is 9 or less. The In-Situ/RH requirement is not to

exceed 75%. Three test results for the first 1,000 sq. ft. are required, with 1 test result for every 1,000 sq. ft. thereafter. The installer may alternate every 1,000 sq. ft. between RH and Calcium Chloride test sites after the first 1,000 sq. ft.

C. Wood subfloors must have a minimum of 18" (45.7 cm) of cross-ventilated space beneath the bottom of the joist.

1. The floor must be rigid, free of movement.

2. Single wood and tongue and groove subfloors should be covered with ¼" (6.4 mm) or ½" (12.7 mm) APA approved underlayment plywood.

a. Use ¼" (6.4 mm) thick underlayment panels for boards with a face width of 3" (76 mm) or less.

3. Do not install over OSB (Oriented Strand Board), particle board, chipboard, lauan or composite type underlayments.

D. Condition of Surfaces to Receive Resilient Materials: Dry, clean and free of oil, grease, or wax.

E. Substrates shall be free of curing compounds, sealers, hardeners.

F. Fill all minor cracks in substrates using approved crack filler in accordance with manufacturer's printed instructions.

G. Flash patch with products acceptable to the resilient flooring manufacturer. If condition requires self-levelling underlayment, refer to that specification in Division 3.

H. Clean substrates of all dirt and loose particles before application of flooring materials.

I. Provide additional underlayment and build up to abutting dissimilar flooring materials.

J. Store and use adhesives in accordance with the manufacturer's printed instructions.

K. Proceeding with installation constitutes acceptance of the substrate conditions.

3.02 INSTALLATION

A. Strictly adhere to manufacturer's printed instructions and the following:

1. Lay resilient tile so as to ensure full uniform contact with substrate and to produce finished surfaces, which are smooth, even, and in true plane, free of buckles, waves, or other imperfections.

2. Cut and scribe tile neatly into breaks and recesses, walls, door frames, casework, and around pipes, columns, and other projections where flashed base is not required.

3. Lay tile square with room axis. Do not install border tiles that are less than 1/2 the width of a field tile. Tile against walls shall be the same width on each side of room.

4. Tile pattern when laid shall lie in an alternating direction as determined by the Architect.

B. Rubber Base:

1. Use approved cove base adhesive and apply in accordance with manufacturer's printed instructions such as Roppe Corporation's No. 205 Cove Base Adhesive or equal. Adhesive shall hold base tightly in contact.

2. Where necessary, patch and fill back-up material with underlayment material to provide continuous, uniform surface.

3. Scribe base accurately; use specified preformed corners; butt joints between sections tightly.

4. Provide base at built-in work, casework, and elsewhere as indicated or required.

C. Reducing Strips: Install at points of transition from new resilient flooring to dissimilar flooring material. Whenever possible, locate strips between door jambs centered under doors.

3.03 ADJUSTMENTS

A. Reset any tiles which have not seated in a level plane with surrounding tiles.

B. Carefully remove and replace any tiles with broken corners with surrounding tiles.

3.04 CLEANING AND PROTECTION

A. Protect floors from rolling loads for 72 hours after installation by covering with hardboard or plywood. Protect the floor with un-dyed, untreated building paper until final inspection.

B. Initial cleaning and maintenance is the responsibility of the installing contractor and must be performed as soon as possible after installation. Initial cleaning may be not be performed until 3 days (72 hours) after installation or as otherwise specified by the manufacturer. The intent is to allow the tile become well seated in the adhesive and to prevent excess moisture and cleaning agents from interfering with the adhesive bond. Sweep and protect the floor until initial cleaning and maintenance can begin.

Initial Cleaning and Maintenance after Installation:

1. Sweep or vacuum floor thoroughly.

2. Clean flooring utilizing a pH neutral cleaner such as Super Shine All by Hillyard. Allow to stand for 5-15 minutes, but do not allow to dry. Scrub with a single disc rotary machine (175-350 rpm) with a blue or green pad. Remove solution and rinse with clean water. Allow flooring to dry completely before applying finish.

   a. Heavily soiled floor may require a stripping procedure as the initial cleaning.

3. Floor finish:

   a. For VCT, Apply four coats of a manufacturer approved high quality commercial floor finish such as Super Hil-Brite by Hillyard, allowing to dry completely between coats.

   b. For VET, Apply three coats of a manufacturer approved high quality commercial floor finish such as Super Hil-Brite by Hillyard, allowing to dry completely between coats.

   c. For SVT, Apply two coats of a manufacturer approved high quality commercial floor finish such as Super Hil-Brite by Hillyard, allowing to dry completely between coats.

   d. S.V.T. has an alternative for maintenance which follows a dry buffing procedure. The awarded scope includes the standard cleaning and application of floor finish. Prior to proceeding with the application of finish, the dry buffing option is to be review with the Owner. If the Owner prefers the dry buffing process then the contractor shall perform the initial dry buffing in lieu of the initial application of floor finish.

3.05 CLEAN UP

A. Remove from the site and legally dispose of all cartons, rubbish, and debris resulting from the work of this Section.

END OF SECTION

DIVISION 9 - FINISHES

SECTION 09680 - CARPETING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide all labor, materials, equipment, and services and perform all operations required to complete the installation of all work of this section and related work as indicated on the drawings and specified herein, including, but not necessarily limited to, the following:

1. Carpeting in rooms and spaces designated on drawings.

2. Rubber base as required by the work.

3. Carpet accessories as required by the work.

4. Substrate preparation as required by the work.

1.02 RELATED WORK

A. Related work specified in other sections of the specifications.

1. Section 09650 - Resilient Floor Tile.

1.03 CONTRACT DOCUMENTS

A. Applicable provisions of the "Conditions of the Contract" and the General and/or Supplementary Conditions shall govern all work under this section.

1.04 QUALITY ASSURANCE

A. Installer's Qualifications:

1. A minimum of three years experience.

2. Successfully completed projects of similar magnitude.

B. Accessibility Requirements:

1. Floor surfaces shall be provided to conform with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and State and Local Regulations. These requirements supersede Technical Specifications in this Section.

1.05 SUBMITTALS

A. Comply with requirements of Section 01300.

B. Manufacturer’s product data, installation and maintenance instructions for all components of the work.

C. Shop Drawings:

1. Carpeted areas shall include the entire area of the room or space, recesses, closets, and similar areas or as indicated on finish floor plans.

2. Shop drawings shall indicate a working layout for each area showing seam locations, pattern of carpet, colors, trim or edge strips, and other pertinent details.

3. No carpet shall be installed before approvals have been received.

D. Samples:

1. Submit two samples of each of the following for approval:

a. Carpet: 12" x 12" each type, pattern, and color.

b. Rubber base or other accessories: Manufacturer's standard sample sizes.

E. Certificates: Prior to shipment of materials, submit to the Architect for approval certificates signed by the manufacturer attesting compliance with specifications.

1.06 DELIVERY, STORAGE, AND HANDLING

A. All carpeting shall be delivered to the job in the original mill wrappings with each roll having its register number properly marked thereon.

B. Adhesives, solvents, and the like shall be delivered to the job in the manufacturer's original unopened containers, clearly marked.

C. All materials shall be stored under cover in clean, dry, well ventilated spaces immediately after delivery to the job. Any material which becomes damaged or soiled and, in the opinion of the Architect, cannot be repaired, will be replaced with new specified material at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. All carpeting shall be first quality. No "seconds" or "imperfects" shall be installed.

B. All carpet shall be Class I and shall have minimum critical radiant flux of not less than .45 watts/sq. cm.

C. All Broadloom carpeting shall be "Constellation-Ecoworx Performance Broadloom" as manufactured by "Shaw Contract Commercial Carpets" or approved equal, of color to be selected by the Architect from the manufacturer's standard line.

Product Type: Performance broadloom
Size: Broadloom 12 foot

Construction: pattern loop
Dye Method: solution & yard dyed
Fiber Product: 100% eco*solution q® nylon – 55% solution dyed/45% space dyed
Protective Treatment(s): SSP® Shaw soil protection
Primary Backing: SYNTHETIC
Secondary Backing: Ecoworx performance broadloom
Gauge: 1/10
Face Weight: 26 oz.
Stitches per inch: 09.83
Finished Pile Thickness: 0.120
Average Density: 7,800 ozs./yd3
Pattern Repeat: 13/32”W X 6 29/32”L
Flammability: ASTM E-648 flooring radiant panel class I, ASTM E-662 NBS smoke chamber less then 450
Electrostatic Propensity: less than 3.5 KV, permanent conductive filament
Warranty: lifetime commercial limited warranty for ecosolution q sd nylon, lifetime commercial limited warranty for Ecoworx performance broadloom backing system
Recommended Installation: full spread Shaw 3500 or Shaw 3600 adhesives
Post Consumer Recycled Content: 0
Post Industrial Recycled Content: 9.7
Green Label Certification #: 59269968
Green Label Plus Certification #: GLP9968

D. All carpet tile shall be “Constellation-Tile” as manufactured by "Shaw Contract Commercial Carpets" or approved equal, of color to be selected by the Architect from the manufacturer’s standard line.

Product Type: carpet tile
Size: 24” x 24”
Construction: loop
Dye Method: solution & yarn dyed
Fiber Product: 55% ECO SOLUTION Q PREMIUM BRANDED NYLON-45% YARN DYED BCF NYLON
Protective Treatment(s): antistatic, SSP® Shaw soil protection, florsept antimicrobial
Primary Backing: SYNTHETIC
Secondary Backing: Ecoworx®
Gauge: 1/10
Face Weight: 24 oz.
Stitches per inch: 09.83
Finished Pile Thickness: 0.099
Average Density: 8,727 ozs./yd3
Pattern Repeat: N/A
Flammability: ASTM E-648 flooring radiant panel class I, ASTM E-662 NBS smoke chamber less than 450
Electrostatic Propensity: less than 3.5 KV, permanent conductive filament
Warranty: lifetime commercial limited warranty for Ecoworx tile backing system
Recommended Installation: monolithic
Post Consumer Recycled Content: 0
Post Industrial Recycled Content: 37.4
Green Label Certification #: 59269968
Green Label Plus Certification #: GLP9968

2.02 CARPET ACCESSORIES

A. Rubber Cove or Wall Base

1. Rubber cove or wall base shall be extruded and as manufactured by Roppe Corporation or equal. It shall be constructed of first quality materials, properly vulcanized, and shall be smooth and free from imperfections which detract from its appearance. The base shall conform fully to the requirements of U.S. Federal Specification SS-W-40a, Type I Rubber. All cove base shall be of the straight Style A, with a height of 4" (101.6 mm), in lengths continuous coil (1.22 m), in the color stated (see No. 4 below), and of 1/8" (3.175 mm) thickness.

2. Height: 4"

3. Thickness: 1/8" gauge.

4. Color: as may be detailed in the finish floor plans or as selected by Architect.

B. Rubber Carpet Edge Guard: shall be by Roppe, or equal. Colors as selected by Architect. Provide edge type as follows:

1. Carpet to Vinyl: Roppe #50 tile/carpet joiner or equal.

2. Carpet Termination Reducer: Roppe #38 or #39, or equal. Glue down carpet edge as required.

3. Coordinate with door schedule (if included) and any metal thresholds that may be indicated under that component of the work.

C. Rubber Stair Nosing: Roppe #13 or #14 single flange carpet stair nosing as required or equal.

D. Adhesive: Water-based, water resistant and non-staining as recommended by carpet manufacturer to comply with flammability and VOC requirements for installed carpet.

E. Seaming Cement: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for use in taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams. Shaw recommends the use of Shaw 3500 or 3600 (AATCC174) adhesives or equivalent adhesives, which have been formulated with a higher solids content and will perform adequately with the Eco Broadloom backings.

F. Leveling and Patching Compounds: Types as recommended by carpet manufacturer and as appropriate for compatibility with substrate.

2.03 OTHER ACCEPTABLE MANUFACTURERS

A. Collins and Aikman
B. Bentley/Prince Street
C. Interface
D. An equal approved by the Architect

PART 3 – EXECUTION

3.01 PREPARATION AND SUBFLOOR CONDITIONS

A. Space Enclosure and Environmental Limitations: Do not install carpet until space is enclosed and weatherproof, wet work in space is completed and nominally dry, work above ceilings is complete, and ambient temperature and humidity conditions are and will be continuously maintained at values near those indicated for final occupancy.

1. Dimensions supplied in these specifications and drawings are approximate. The Contractor shall carefully check dimensions and other conditions affecting his work in the field and shall be responsible for proper installation of carpet in areas designated.

2. Surfaces to receive carpet shall be thoroughly clean, smooth, free from irregularities, and dry; apply sealer recommended by carpet manufacturer to prevent dusting if required.

3. Contractor shall prepare floors to receive new flooring by washing, etching, sanding, or filling or other procedures as necessary for satisfactory installation.

B. Subfloor Moisture Conditions: Moisture emission rate of not more than 5 lbs./1000 sq.ft./24 hours where tested by anhydrous calcium chloride moisture test in compliance with CRI 104, with subfloor temperatures not less than 55°F.

1. Contractor shall include in the base bid additional costs for any additional surface preparation work and materials required to install carpet relative to specific slab-moisture content.

C. Subfloor Alkalinity Conditions: A pH range of 5 to 9 when subfloor is wetted with potable water and pHydrion paper is applied.

D. Apply latex underlayment where required to correct subfloor. Fill concrete slab on grade control joints with latex or as recommended by manufacturer for proper substrate. Underlayment shall be steel troweled smooth to prevent marks showing through installed carpet. Substrate imperfections telegraphing through installed carpet will not be acceptable and shall be reason to remove.

E. Concrete floors must be sealed if dusting or powdering exists. **Do not use sweeping compounds as they may leave oily deposits.** The following floor sealers are suggested for concrete. Coordinate with manufacturers requirements for materials selected.

1. Shaw Contract 9050 Floor Sealer and Shaw 8550 Level Primer.

2. Kure-N-Seal-Sonneborn #0800 – Chemrex, Inc.

3. Spartan Cote Cure Seal Hardener – The Burke Group.

3.02 INSTALLATION

A. Carpeting shall be installed in accordance with the manufacturer's instructions and the best methods of the trade.

B. All surfaces to receive carpet shall be level, smooth, clean, and dry, in a finished condition suitable to receive carpet. The carpet contractor shall notify the Owner in writing of any and all conditions to the contrary or otherwise unsatisfactory. In an instance where the flooring Contractor is the Prime Contractor, this Contractor shall be responsible for all floor preparation unless otherwise indicated. The installation of carpet shall be an indication of his acceptance of the existing conditions. No carpet shall be installed before approval.

C. Broadloom carpet shall be installed with adhesive applied directly to the sub-floor. Where seams occur in carpeting, they shall be seam sealed and latex reinforced with a lifetime edge ravel warranty. Where edge of carpeting butts other flooring material, the edges shall be protected with rubber edge strip unless aluminum thresholds are otherwise indicated. Edging shall be anchored to concrete floors with adhesive.

1. Fit sections of carpet prior to application of adhesive. Trim edges and butt caps with seaming cement.

2. Apply adhesive uniformly to substrate in accordance with manufacturer’s instructions. Butt edges tight to form seams without gaps. Roll entire area lightly to eliminate air pockets and ensure uniform bond. All seams on vinyl backed carpet are to be chemically welded.

3. All patterned carpet shall have pattern aligned at seams.

D. Carpet tile shall be installed with pressure sensitive adhesive such as Shaw Contract 5000, 5100 or equal. A 3/8” foam paint roller may be used to apply the adhesive. Allow the adhesive sufficient open time so that it will not transfer to the back of the tile. **The adhesive must be allowed to dry completely before installing the carpet.** Installing into wet adhesive will result in a permanent bond and may cause carpet to bubble. **NOTE – A FULL SPREAD OF ADHESIVE IS REQUIRED.**

E. Roll entire installation with a 75# roller at completion.

F. On completion of installation, dirt, carpet scraps etc., must be removed from the surface of the carpet. The carpet must be cleaned with a beater type vacuum cleaner. Soiled spots or adhesive on the carpet shall be removed with the proper spot remove. Loose pieces of face yarn must be removed with sharp scissors.

G. Use plywood over the carpet when heavy objects are moved within 24 hours after installation. A non-staining building material paper must be placed over the carpet to protect it when additional construction activity is to take place that would soil or stain it.

Do not use plastic sheeting as it will trap moisture.

3.03 MAINTENANCE

A. The carpet manufacturer shall conduct a maintenance seminar for Owner's personnel.

B. Include a maintenance schedule and a list of necessary equipment required to maintain carpet.

3.04 EXTRA MATERIALS

A. Deliver extra materials to Owner. Furnish extra materials matching products installed as described below packaged with protective covering for storage and identified with labels describing contents.

1. Carpet & Carpet Tile: Furnish quantity of material, in full width roll, equal to 2 percent of the amount of each carpet type installed, but not less than 100 sq. ft.

3.05 WARRANTY

A. Manufacturer must guarantee the following:

1. Abrasive Wear: Warrant that the carpet will lose no more than 10 percent by weight of pile face fiber during the lifetime warranty period when installed and maintained in accordance with manufacturer's procedures.

2. Static Protection: Warrant that the carpet will not generate static build-up in excess of 3.5KV during the lifetime warranty period as tested by AATCC test method 134.

3. Backing Integrity Delamination: Warrant that the secondary backing of the carpet will not delaminate from the face carpet for lifetime warranty period. Chair pads are not required whether the carpet is installed direct to the floor or by conventional tackless installation over cushion.

4. Edge Ravel: Warrant that under normal use the carpet will not edge ravel at seams or edge for the lifetime warranty period.

5. Tuft Bind: Warrant that the carpet will have an average face yard tuft bind of 20 pounds for the lifetime warranty period when tested using the ASTM D-1335-67 method. This portion of the warranty must protect against insufficient tuft bind, whether the carpet is dry or wet (as it might be during steam cleaning, hot water extraction, or as a result of a broken pipe or flood).

6. Pattern matching of seams (Broadloom only): Warrant that under normal use the carpet will pattern match within acceptable industry standards. Regardless of pattern repeat size, when installed in accordance with manufacturer installation guidelines.

7. Moisture Management (Broadloom Only): Warrant that under

normal use, the carpet will keep liquid spills above the pre-coat layer for a minimum of 24 hours as tested under the British Spill Method; Part 2.

B. Warranty shall be from the manufacturer, written specifically for the project.

DIVISION 9 – FINISHES

SECTION 09900 – PAINTING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.02 DESCRIPTION

A. Work included: Paint and finish all new and existing interior and exterior wall surfaces related with proposed work area and all new and existing steel structures specified on drawings.

1. Examine the specifications and drawings of all trades and thoroughly be familiar with all provisions regarding painted work included therein. Surfaces shown, noted, scheduled, or specified to receive painters' finish as part of the work of this section.

2. The painting subcontractor shall furnish, maintain, and remove when no longer required, all scaffolding, staging, and riggings required for this work.

1.03 RELATED WORK DESCRIBED ELSEWHERE

A. Shop Coats: Refer to specific project manual sections for shop coats on items such as structural steel, miscellaneous metal, custom hollow metal work, and similar items.

B. Pre-Finished Items: Refer to specific project manual sections for factory-finished, or installer finishes.

1.04 WORK NOT INCLUDED

A. Do not include painting, which is specified under other sections.

B. Unless otherwise indicated, painting is not required on surfaces in concealed areas and inaccessible areas such as furred spaces, foundation spaces, utility tunnels, pipe spaces, and duct shafts.

C. Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze, and similar finished materials will not require painting under this section except as may be specified herein.

D. Do not paint any moving parts of operating units, mechanical or electrical parts such as valve operators, linkages, sinkages, sensing devices, and motor shafts, unless otherwise indicated.

E. Do not paint over any required labels or equipment identification, performance rating, name or nomenclature plates.

1.05 DEFINITIONS

A. The term "paint," as used herein, means all coating systems materials including primers, emulsions, epoxy, enamels, stains, sealers, fillers, and other applied materials where used as prime, intermediate, or finish coats.

1.06 QUALITY ASSURANCE

A. Standards: Comply with standards specified in the section and as listed in Section 01085.

B. Qualifications of Manufacturers: Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the Architect.

C. Qualifications of Applicators:

1. Provide at least one person who shall be present at all times during execution of the work of this section, who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.

2. Provide adequate numbers of workman skilled in the necessary crafts and properly informed of the methods and materials to be used.

3. Minimum three years of experience in applying commercial coating systems similar to the materials specified.

D. Paint Coordination:

1. Provide finish coats, which are compatible with the prime coats used.

2. Review other sections of this specification as required, verifying the prime coats to be used and assuring compatibility of the total coating system for the various substrata.

3. Upon request, furnish information on the characteristics of the specific finish materials to ensure that compatible prime coats are used.

4. Provide barrier coats over non-compatible primers, or remove the primer and re-prime as required.

5. Notify the Architect in writing of anticipated problems in using the specified coating systems over prime coating supplied under other sections.

E. Field Samples:

1. Before proceeding with paint application, finish one complete surface of each color scheme required, clearly indicating selected colors, finish texture, materials, and workmanship.

2. Sample areas, when accepted by the Architect, shall serve as a minimum standard fro work throughout the entire project.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the job site in the manufacturer's original unopened packages and containers bearing manufacturer's name and label and the following information:

1. Product name or title.

2. Product description (generic classification or binder type).

3. Federal Specification Number, if applicable.

4. Manufacturer's stock number and date of manufacture.

5. Contents by volume, for pigment and vehicle constituents.

6. Thinning instructions.

7. Application and instructions.

8. Color name and number.

B. Storage:

1. Provide proper storage to prevent damage to, and deterioration of, paint materials.

2. Store all materials in a single location approved by the Architect. Storage area is to be kept neat and clean. Any damage to the storage area or surrounding occurring during its use for storage shall be repaired to its original state (Architect's acceptance required). Remove all soiled or used rags, waste, and trash from the building every night and take every precaution to avoid damage of fire.

C. Protection:

1. Use all means necessary to protect the materials of this section before, during, and after installation and to protect the work and materials of other trades.

D. Replacement:

1. In the event of damage, immediately make all the repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

1.08 JOB CONDITIONS

A. Provide continuous heating and ventilation as required to maintain surface and ambient temperatures above 50°F for at least 24 hours before, during and for at least 48 hours after paint application.

B. Do not apply paint in snow, rain, fog, or mist, or when relative humidity exceeds paint manufacturer's recommended limits. Avoid painting surfaces while they are exposed to hot sun.

C. Lighting: Provide minimum 80 foot candle light level at mid-height of substrate surface.

1.09 EXTRA STOCK

A. Amount: Upon completion of the work of this section, deliver to the Owner an extra stock equaling 10% of each color, type, and gloss of paint used on the work.

B. Packaging: Tightly seal each container and clearly label with the contents and location used.

1.10 SUBMISSIONS

A. General: Comply with requirements of Section 01300 and as modified bellow.

B. Product Data:

1. Submit to the Architect a complete schedule of paint materials proposed to be furnished and installed under this section, including name of manufacturer and type of paint.

2. Manufacturer's specifications and other data required to demonstrate compliance with the specified requirements.

3. For information only, submit two copies of manufacturer's specifications, including paint analysis and application instructions for each material. Indicate by transmittal that a copy of each manufacturer's instructions has been distributed to the applicator.

C. Samples: Submit three (3) 8 ½" x 11" paint strike offs of each paint color and paint type specified for color match verification. Identify each sample as to finish, formula, color name, and color number.

D. Stain Samples: Submit three (3) 8 ½" x 10" wood samples of stain matching specified wood species and color for architect's approval.

E. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOC's).

PART 2 – PRODUCTS

2.01 PAINT MATERIALS

A. Design is based on the use of paint products manufactured by Benjamin Moore and the materials of that manufacturer are named in the painting schedule. Equal products of other manufacturers approved in advance by the Architect may be utilized.

B. General: Provide the best quality grade of the various types of coatings as regularly manufactured by paint materials manufacturers approved by the Architect. Materials not displaying the manufacturer's identification as a standard best-grade product will not be acceptable.

C. Durability: Provide paints of durable and washable quality. Do not use paint materials, which will not withstand normal washing, as required to remove pencil marks, ink, ordinary soil, and similar material without showing discoloration, loss of gloss, staining or other damage.

D. Colors and Glosses: Provide colors and glosses to match existing from manufacturer's full range of colors for each product indicated.

E. Undercoats and Thinners: Provide undercoat paint produced by the same manufacturer as the finish coat. Use only the thinners recommended by the paint manufacturer, and use only the recommended limits. Insofar as practicable, use undercoat, finish coat, and thinner material as parts of a unified system of paint finish.

F. Standards: Provide paint materials which meet or exceed the standards listed for each application in the Painting Schedule in Part 3 of this section.

1. All paint to be V.O.C. compliant.

G. Application Equipment: For application of the approved paint, use only such equipment as is recommended for application of the particular paint by the manufacturer of the particular paint and as approved by the Architect.

H. Other Materials: All other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first-quality of their respective kinds, and as selected by the Contractor subject to the approval of the Architect.

PART 3 – EXECUTION

3.01 INSPECTION

A. Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that such work is complete to the point where this installation may properly commence. Verify that painting may be completed in strict accordance with the original design and with the manufacturer's recommendations as approved by the Architect.

3.02 DISCREPANCIES

A. Do not proceed in areas of discrepancy until all such discrepancies have been fully resolved.

1. Start of painting will be construed as the applicator's acceptance of surfaces and conditions within a particular area.

3.03 MATERIALS PREPARATION

A. General

1. Perform all preparation and cleaning procedures in strict accordance with the paint manufacturer's requirements and application instructions as approved by the Architect.

2. Remove all removable items, which are in place and are note scheduled to receive paint finish, or provide surface-applied protection prior to surface preparation and painting operations.

3. Following completion of painting in each space or area, reinstall the removed items by using workmen skilled in the necessary trades.

4. Clean each surface to be painted prior to applying paint or surface treatment.

5. Remove oil and great with clean cloths and cleaning solvents of low toxicity and a flash point in excess of 38°C (100°F), prior to start of mechanical cleaning.

6. Schedule the cleaning and painting in coordination with the Owner.

B. Preparation of Metal Surfaces: Clean non-galvanized, ferrous metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council.

1. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.

2. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush; clean with solvents recommended by the paint manufacturer, and touch-up with same primer as the shop coat.

3. On galvanized steel, aluminum and other non-ferrous metals: clean bare metals with oil and grease emulsifier in accordance with manufacturer's instructions. BM Corotech V600 or XIM GON-20 Prep Cleaner or equal.

4. Allow to dry thoroughly before application of paint.

3.04 STAIN APPLICATION

A. Clean wood surfaces to be painted of dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view and dust off. Scrape and clean small, dry seasoned knots and apply a thin coat of white shellac or other recommended knot sealer before application of priming coat. After priming fill holes and imperfections in finished surfaces with putty or plastic wood filler. Sandpaper smooth when dried.

B. Stain or seal wood required to be painted immediately upon delivery to job. Prime edges, ends, faces, undersides, and backsides of such wood, including cabinets, counters, cases and paneling.

C. When transparent finish is required, use spar varnish for back priming.

D. Back-prime paneling on interior partitions only where masonry, plaster, or other wet wall construction occurs on backside.

E. Seal tops, bottoms, and cut-outs of unprimed wood doors with a heavy coat of varnish or equivalent sealer immediately upon delivery to job.

3.05 PAINT APPLICATIONS

A. General

1. Apply products in accordance with manufacturer's instructions.

2. Secure color schedules before applying paint or finish. Tint primer and undercoat to the approximate shade of the finish coat.

3. Apply all materials under adequate illumination and as follows:

a. Brush Application: Brush out and work all brush coats onto the surfaces in an even film. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, and other surface imperfections will not be acceptable.

b. Spray Application:

1. Confine spray application to metal framework and similar surfaces where hand brushwork would be inferior.

2. Wherever spray application is used, apply each coat to provide the equivalent hiding of brush-applied coats. Do not double back with spray equipment for the purpose of building of film thickness of two coats in one pass.

4. Allow sufficient drying time between coats. Modify the period as recommended by the material manufacturer to suit adverse weather conditions.

5. Apply materials in sufficient quantity to insure complete coverage and hide. Provide and apply additional coats until paint film is uniform in finish, color, appearance, and coverage.

B. Cleaning:

1. Promptly remove spilled, splashed, or splattered paint on finish as work proceeds and upon completion.

2. Keep premises free from any unnecessary accumulation of tools, equipment, surplus materials, and debris during progress of work.

3. Upon completion of work, leave premises in neat and clean condition.

C. Completed work shall match the approved samples for color, texture, and coverage. Remove, refinish, or repaint all work not in compliance with specified requirements.

3.06 PAINTING SCHEDULE

A. General: Painting required under this section is called for on the drawings. Paint types for specific surfaces, exterior and interior are as defined below:

Exterior Work			
Surface	**1st Coat**	**2nd Coat**	**3rd Coat**
Hollow Metal Doors & Frames (Note 3 & 4)	B or *	A	A
Exposed Miscellaneous Metal or Structural Steel (Note 3 & 4)	T or *	I	I
Steel Handrails & Steel Lintels (Note 3 &4)	T	I	I
Traffic Bearing Exterior Metals (Steel Ladders – Foot Traffic) (Note 3 & 4)	N	R	R
Aluminum (Note 4)	B	A	A
Wood, Visible Blocking, Plywood	C	D	D
Visible Metal Plaster accessories adjoining stucco	T	I	I
Concrete Block	E	F	F
Galvanized Metal (Note 4)	B	I	I
Concrete Walls	O	F	F

Interior Work			
Surface	**1st Coat**	**2nd Coat**	**3rd Coat**
Concrete Block	E	G	G
Plaster	M	G	G
Gypsum Drywall	M	G	G
Concrete Walls	O	G	G
Concrete Floors (Note 1 & 5)	N	Q	Q
Concrete Floors (High Vehicle Traffic, Wet Environments) (Note 1)	N	U	R
Wood-Painted (Note 2)	H	G	G
Wood-Natural Finish	J	J	J
Wood-Stained Finish	S	J	J
Hollow Metal, Steel Handrails & Steel Stair Components (Note 3 & 4)	B or *	A	A
Exposed Structural Steel & Steel Joists (Note 3 & 4)	B or *	K or L	K or L
Galvanized Steel Floor or Roof Deck (Note 4)	B	K or L	K or L
Miscellaneous Metal (Note 3 & 4)	B or *	L	L
Steel Floor Deck (Diamond Plate etc.) (Note 3 & 4)	N	R	R
Galvanized Metal (Note 3 & 4)	B	A	A
Exposed Ductwork (Note 4)	B	K or L	K or L

*Shop Coat – See other sections of Project Manual

Note 1: Where non-skid properties are required, a non-skid additive shall be used. Apply per manufacturer's instructions. Confirm if required via Architect.

Note 2: This is for large exposed surfaces. Where paint is indicated on narrow recesses, or on visible surface of back-up supports or blocking, use flat enamel.

Note 3: Inspect shop coat and touch up prior to finish coat application to prevent finish coat contacting bare steel. All exposed structural steel is to be painted in finished areas as per schedule unless noted otherwise on the Contract Documents.

Note 4: Prior to priming and painting of exposed ductwork, galvanized steel, aluminum and other non-ferrous metals the Contractor shall clean bare metal with an oil and grease emulsifier (Moore's Corotech V600 or XIM GON-20 Prep Cleaner or equal). This product shall be ready to apply from the container. Careful surface preparation and cleaning is required. All surfaces shall be thoroughly clean and free from all grease, wax, oil, polish, loose paint, dirt or rust. Do not use mineral spirits, turpentine solvent or cleaners which will leave an oily residue. Apply clean and remove/rinse in accordance with manufacturer's instructions.

Note 5: For concrete floors V155 (TYPEN) is 1st coat for V410. If Type N122 is chosen 1st coat is a thin coat of N122

3.07 KEY TO PAINTS

* Shop coat: See other section of Project Manual.

A	Moore's Corotech Acrylic DTM Enamel Semi-Gloss V331
B	Moore's Corotech Acrylic Metal Primer V110
C	Moore's Fresh Start Exterior Oil Primer 094
D	Moore's Ultra Spec EXT Low Lustre Finish N455
E	Moore's Ultra Spec Masonry Int/Ext Hi-Build Block Filler 571 or Moore's Blockfiller 244.
F	Moore's Ultra Spec EXT Gloss N449
G	Moore's Ultra Spec 500 Interior Latex Gloss N540 (traditional semi-gloss) or BM Ultra Spec 500 Interior Latex Eggshell N538 (Item "G" gloss shall be determined by this Architect)
H	Moore's Fresh Start Multi-Purpose Oil-Based Primer 024
I	Moore's Super Spec HP Urethane Alkyd Gloss Enamel P22
J	Moore's Benwood Stays Clear Acrylic Polyurethane Low Lustre N423
K	Moore's Latex Dry Fall Flat 395
L	Moore's Ultra Spec 500 Interior Acrylic Flat N536
M	Moore's Fresh Start Multi-Purpose Latex Primer 023
N	Moore's Corotech 100% Solid Epoxy Pre-Primer V155
O	Moore's Ultra Spec Masonry Int/Ext 100% Acrylic Masonry Sealer 608
P	NOT USED
Q	Moore's Latex Floor & Patio Enamel Low Sheen N122, or BM Corotech Fast Dry Polyamide Epoxy V410 (Item "Q" shall be as determined by this Architect).
R	Moore' Corotech Aliphatic Acrylic Urethane Semi-Gloss V510
S	Moore's Lenmar Waterborne Interior Wiping Stain 1WB.1300
T	Moore's Super Spec HP Alkyd Metal Primer P06
U	Moore's Corotech 100% Solids Epoxy Floor Coating V430

END OF SECTION

DIVISION 14 - CONVEYING SYSTEMS

SECTION 14226 – INCLINE WHEELCHAIR LIFT

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the General Documents, as listed in the Table of Contents, and to applicable portions of Division 14 which are herewith made a part of this section.

1.02 SCOPE

A. Lift must be in accordance with ANSI A.17.1, Section 2000, A.D.A. compliant in the USA, including local codes and regulations except where specified otherwise.

B. The General Contractor shall furnish all labor, material, and equipment necessary or required to fully complete the installation of inclined wheelchair platform lift units with all accessories as specified, in locations as indicated on the drawings and within the specifications. All required power feeds and connections required for the proper operation of the wheelchair lift shall be provided by the Electrical Contractor under his Base Bid.

1.03 RELATED WORK

A. The following work is to be performed under the designated sections and coordinated with the work in this section:

1) Section 03300 - Concrete
2) Section 04200 - Unit Masonry
3) Section 06100 - Rough Carpentry
4) Division 16 - Electrical

1.04 PREPARATORY WORK

A. The following preparatory work to receive the lifts specified shall be part of the scope:

1. Permanent power to operate the lift to be provided by the Electrical Contractor from a lockable fused/cartridge type disconnect switch with auxiliary contacts for battery operation. Temporary power may be provided to expedite installation of lift.

2. Provide a plumb and square hoistway with smooth interior surfaces. Include for fascias or furring of the hoistway interior.

3. Provide adequate lighting of lift platform and at landings.

4a. Suitable lintels over landing entrances are to be provided.

4b. Provide rough openings as per lift contractor's shop drawings.

5. Provide substantial level pit floor slab as indicated on the lift contractor's shop drawings.

6. Provide finish grouting and masonry around doorframes.

1.05 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Must have ISO 9001 quality system certification and must be a firm with a minimum of 10 years experience in the manufacturing of inclined platform lifts, with evidence of experience with similar installations of the type specified.

B. Installer / Subcontractor's Qualifications: Must be a contractor licensed to install equipment of this scope, with evidence of experience with this equipment. The installer must also employ competent personnel, maintain an adequate stock of replacement parts, have qualified people available to ensure fulfillment of maintenance and call-back service without unreasonable loss of time in reaching the job site.

1. Execute work of this section only by a company who has adequate product liability insurance in excess of one million dollars ($1,000,000).

2. Skilled tradesmen must be employees of the contractor to perform the work on a timely basis.

3. Requirements of Regulatory Agencies:

a. Fabricate and install work in compliance with applicable jurisdictional authorities.

b. File shop drawings and submissions with local authorities as the information is made available. Company pre-inspection and jurisdictional authority inspections and permits are to be made on a timely basis as required.

c. Payment of operating licenses will be the responsibility of the Owner.

1.06 REGULATORY REQUIREMENTS:

A. Regulatory Requirements: Materials and construction shall comply with the current edition of the following codes, standards and guidelines:

1) ASME A17.1 "Safety Code for Elevators and Escalators", Part XX (Commercial and Public Buildings) or ASME A18.1 "Safety Standard for Platform Lifts and Stairway Chairlifts."

2) CSA-B355 "Lifts for Persons with Physical Disabilities."

3) ANSI A117.1 "Providing Accessibility and Usability for Physically Handicapped People."

4) ANSI/NFPA No 70 National Electric Code.

5) CSA Testing for mechanical and electrical equipment.

6) ADA Accessibility Guidelines

7) New York State Building Code

1.07 SUBMITTALS

A. Manufacturer's Data: Submit the manufacturer's specifications and installation instructions for each complete system. Include a complete listing and description of performance and operating characteristics. Show maximum and average power demands.

B. Shop Drawings: The shop drawings shall show a complete layout of lifting equipment detailing dimensions and clearances as required. Include shop drawings for each platform lift system, including typical details of assembly, erection and anchorage. Include wiring diagrams of power distribution, controls, and signals for the entire system. Before beginning the work, the contractor shall submit to the Architect for his approval, detailed drawings, showing the complete layout of the Stair-Lift equipment, location of all machinery and apparatus, together with any suggested alterations to the items specified.

C. Samples: Submit samples of each exposed finish required for platform lift work.

1.08 JOB CONDITIONS

A. The wheelchair lift shall not be used for the hoisting of materials or personnel during the construction period.

1.09 WARRANTY

A. Extended Warranty: Manufacturer shall warrant the wheelchair lift materials and workmanship for an additional (3) years following completion of the installation and execution of a Preventive Maintenance Program Agreement for the warranty period.

1.10 MAINTENANCE

A. The cost of renewals or repairs caused by reason of negligence, misuse, or accidents beyond the control of the Stair-Lift contractor shall not be his responsibility.

B. If call-back service is required between regular inspections, and is necessitated by defects which are not covered by the warranty, this contractor will be reimbursed by the owner of the lift. Call-back service necessitated by defects which are covered by the warranty shall be provided without charge.

PART 2 - PRODUCTS

This section covers the supply and installation of one inclined wheelchair lift system.

2.01 MANUFACTURER

A. **Garaventa Stair-Lift Model XPRESS II** inclined wheelchair platform lift, or as approved equal by the Architect.

2.02 PLATFORM TYPE

A. Platform and ramps to be folded and unfolded electrically from the call station adjacent to the occupied landing.

B. Platform Size: "1220" Platform (48" long)

C. Platform to be rated for a load of 225kg (495 lbs.), with minimum 5X safety factor.

D. Non-slip surfaces on the deck and ramps.

E. Lift to be equipped with a platform grab rail.

F. Ramps are 152mm (6") high when folded up to prevent accidental wheelchair roll-off.

G. Sidewall, 175mm (6.9") high.

H. Clearances: When folded, the platform should not protrude more than 260mm (10.2") from the mounting surface. When unfolded and in use, it should not protrude more than 1020mm (40.2") from the mounting surface (based upon direct mount to wall - add 65mm (2.6") if self-supporting towers are used to support the system).

I. Platform to travel at a speed of: Up: 4m (13 ft) per minute, Down: 4.9m (16ft) per minute.

J. Platform to have travel safeties that will cause the lift to stop if an obstruction, causing four pounds of pressure, is met. Two main sensing devices will cause the platform to stop: a Touch-Sensitive Plate under the platform and Bi-Directional Touch-Sensitive Ramps, which operate from both the inside and outside of the platform surface. When traveling in either the folded or unfolded position, contacting the ramp plates will automatically stop the lift. The lift must be capable of "backing away" from any obstruction encountered without the requirement to first clear the

obstruction. This important feature ensures that an independent operator can return safely to an unobstructed landing.

K. Fold-down Seat, with a safety belt, to be provided on the platform.

L. The platform shall be provided with power-operated, retractable passenger restraining arms conforming to the following.

1) The arms shall be located above the perimeter of the car platform at not less than 813mm (32”) or greater than 965mm (38”). Gaps between the adjacent ends of arm sections shall not exceed 102mm (4”) when the arms are in their guarding positions.

2) The arms shall be of a smooth construction with all edges rounded. They shall not be permanently deformed when a force of 300N (66 lbf) is applied on any point along the length of the arms in any direction. In addition, they shall not be permanently deformed when a force of 1000N (225 lbf) is applied in the horizontal direction along the centerline of the platform.

3) The arms shall be provided in independent sections. At landings, where the platform is located over the stairs for boarding, the retractable ramps and arm at the boarding end of the platform shall be operable only when the arm at the non-boarding end of the platform is in its locked guarding position across the end of the platform.

4) Each retractable arm shall be equipped with a mechanical lock and an electrical contact which shall stop the movement of the platform within 51mm (2”) of travel away from the landing if the arm at the board end of the platform has failed to reach it’s correct locked guarding position. Means shall be provided to manually unlock the retractable arms for emergency evacuation purposes.

5) Operation of the safety arms shall be integrated with the lift control system such that a single button on the platform or on the call station will call the platform and open and close the platform and the safety arms. The power-operated arms shall be equipped with an electronic sensing system that stops the movement of the arms automatically if an obstruction is encountered. The arms shall retract automatically when the constant pressure control is released.

2.03 OPERATING CONTROLS - 24 Volts dc

A. Platform: Keyless operation, constant pressure directional buttons,
emergency stop switch and plug-in extension control for passenger or attendant operation. Platform ramps and platform underside equipped with obstruction sensitive cut-off safeties. Ramps and arms (if so equipped) must open automatically when the directional control switch is released at the desired landing.

B. Call Station at each landing:

1) Keyless, constant pressure platform call control.
2) One Touch Control System to automatically fold/unfold the platform, access ramps and wrap around safety arms.
3) Emergency stop button.

2.04 DRIVE SYSTEM

A. Motor to be .75 HP, 208-240 VAC, controlled by a frequency inverter and positioned within the conveyance.

B. Power Transmission: Worm gear reduction to a pinion moving on a fixed gear rack.

C. Rail System: Main Upper Rail: Champagne anodized aluminum extrusion weighing 8lbs. per foot, with integrally mounted zinc plated gear rack. Lower Rail: 1.5" x 2.5" champagne anodized aluminum extrusion.

D. Over-speed governor and brake on upper carriage drive, containing mechanical over-speed sensor and lock, with electrical drive cut-out protection.

E. Emergency battery lowering to lower lift during a power failure.

2.05 FINISHES

A. Rail Extrusions and loading ramps are fabricated of aluminum with a champagne anodized finish. The non-aluminum components of the lift, including the optional arms are finished with electrostatically applied baked powder finish in Satin Grey (fine textured). The conveyance is made of beige ABS/PVC.

2.06 PEDESTRIAN GRAB RAIL

A. A pedestrian grab rail to be mounted to the top of the upper rail section. The handrail will be on the same plane as the upper rail of the lift.

2.07 AUTOFOLD

A. To automatically fold the platform into the storage position if left unused in the open position at a landing for a period of 1-10 minutes (field adjustable).

2.08 AUDIO-VISUAL ALERT

A. Audio-Visual Alert(s) to be installed in the stairway. Alert units must be wall mounted in sufficient numbers to be visible from both landings whenever the platform is operating in the stairway in either the folded or unfolded position.

PART 3 - EXECUTION

3.01 EXECUTION

A. Examination:

1. All site dimensions shall be taken to ensure that tolerances and clearances have been maintained and meet local regulations.

B. Preparation:

1. Pre-inspect the construction and service requirements for work by others. These requirements will be included in drawings, diagrams, engineering data sheets, and special instructions before the work commences.

3.02 GUARANTEE

A. The lift contractor shall provide three (3) years free service from date of approval by local authorities. The entire lift and all component parts shall carry a one (1) year guarantee. The guarantee shall be for the replacement, at no cost of defective parts, but shall not include the labor costs required to replace the defective part or parts.

B. Install all the components of the lift system that are specified in this section to be provided and that are required by jurisdictional authorities to license the lift.

C. All installation work of this section will be performed by trained employees of the lift contractor.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15010 - GENERAL PROVISIONS

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

A. This Section contains General Provisions related specifically to the Mechanical Work.

1. Quality Assurance.
2. Terminology.
3. Protection.
4. Coordination and Sequencing.
5. General Completion.
6. Demolition.
7. Cutting and Patching.
8. Excavation for Mechanical Work.
9. Concrete for Mechanical Work.

B. Drawings and General Provisions of Contract, including General and Supplementary Conditions, apply to this section.

1.02 QUALITY ASSURANCE

A. Laws, Permits, Inspections.

1. Comply with latest revisions of New York State Uniform Fire Protection and Construction Code, NYSED Manual of Planning Standards, any Local Codes or Regulations that apply.
2. Underwriters Laboratories label required for all electrical materials carrying 50 volts or more.
3. Comply with New York State Energy Conservation Construction Code.
4. Comply to requirements of drawings and specifications that are in excess of governing codes.
5. Comply with section 1621 of the New York State Building Code for seismic requirements.
6. Do not install work as specified or shown if in conflict with governing code. Notify Engineer and request direction.
7. Pay all Inspection and Permit fees.
8. Provide Certificate of Inspection from all governing authorities.

B. Reference to technical society, organization, body or section made in accordance with the following abbreviations:

1. AIA American Institute of Architects
2. AMCA Air Moving and Conditioning Association, Inc.
3. ANSI American National Standards Institute.
4. ASHRAE American Society of Heating, Refrigerating and Air Conditioning Engineers
5. ASME American Society of Mechanical Engineers
6. ASTM American Society of Testing Materials
7. AWSC American Welding Society Code
8. AWWA American Water Works Association
9. IEEE Institute of Electric and Electronics Engineers

10. NEC National Electric Code
11. NEMA National Electrical Manufacturer's Association
12. NFPA National Fire Protection Association
13. NYBFU New York Board of Fire Underwriters
14. NYCRR - Codes, Rules and Regulations of the State of New York.
15. NSF - National Sanitation Foundation
16. PDI - Plumbing and Drainage Institute.
17. SMACNA Sheet Metal and Air Conditioning Contractors National Association
18. UL Underwriters' Laboratories, Inc.

C. Contractor submission of equivalent or substitute items other than those specified is at Contractor convenience only. If a substitution or equivalent is accepted, the Contractor shall coordinate the installation of the substitute or equivalent and make all associated changes required. The Contractor also waives any claim for additional costs associated with the substitute / equivalent which becomes apparent before, during or after installation. The Contractor agrees to bear any and all additional costs to all other contractors or subcontractors which are caused by the incorporation of the substitution / equivalent.

D. The Contractor shall, as part of his contract, furnish and install all equipment, materials, wiring accessories, and on-site installation of equipment as required by current standards of good practice.

E. All materials and equipment to be furnished and installed shall be new and of first quality and be free from all defects.

1.03 TERMINOLOGY

A. The following terminology and definitions are used on this project as related to the Mechanical Work.

1. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below the roof, spaces above ceilings, unexcavated spaces, crawl spaces and tunnels.
2. Exposed Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
3. Exposed Exterior Installations: Exposed to view outdoors, or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
4. Concealed Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.
5. Concealed Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants, but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

6. Sewers: Refer to underground connections from building to street mains. Sewers begin at points 5 feet outside building wall.
7. Service Connections: Refer to underground connections from 5 feet outside building wall to street mains.
8. Underground Lines: Refer to piping buried in earth inside and within 5 feet outside building.
9. Building Lines: Refer to all other lines.
10. For other definitions refer to latest issue of New York State Plumbing Code, and all revisions.

1.04 PROTECTION

A. Protect equipment from damage, including water, chemical, mechanical injury and theft.

B. Replace damaged equipment or components.

C. Close and waterproof between sleeves, openings, pipes and voids in walls, floors and foundations to prevent entrance of water or moisture.

D. Holes made in fire walls, partitions, fire stops, shall be patched to maintain fire rating integrity.

E. Deliver pipes and tubes with factory-applied end-caps. Maintain end-caps through shipping, storage and handling to prevent pipe-end damage and prevent entrance of dirt, debris and moisture.

F. Protect stored pipes and tubes from moisture and dirt. Elevate above grade. When stored inside, do not exceed structural capacity of the floor.

G. Protect flanges, fittings, and piping specialties from moisture and dirt.

H. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

I. If permanently installed air handler equipment/systems are used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 shall be used in each unit and at each return air grille/opening, as determined by ASHRAE 52.2 Replace all unit filtration media with a Minimum Efficiency Reporting Value (MERV) of 13 immediately prior to occupancy and verify ductwork cleanliness; if ductwork is found contaminated, clean ductwork and associated air handling equipment and replace filtration media.

1.05 COORDINATION AND SEQUENCING

A. Coordinate mechanical equipment installation with other building components.

B. Arrange for chases, slots and openings in building structure during progress of construction, to allow for mechanical installations.

C. Coordinate the installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components, as they are constructed.

D. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Coordinate installation of large equipment requiring positioning prior to closing in the building.

E. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.

F. Coordinate requirements for access panels and doors where mechanical items requiring access are concealed behind finished surfaces. Access panels and doors shall be submitted and approved by the engineer.

G. Coordinate installation of identifying devices after completion of covering and painting, where devices are applied to surfaces. Install identifying devices prior to installation of acoustical ceilings and similar concealment.

H. Coordination with other trades: Right-of-Way as follows:

1. Light Fixtures.
2. Drain Pipes and Vents.
3. Ductwork.
4. HVAC Piping.
5. Domestic Water Piping.
6. Electrical Conduit.

I. Work in existing building.

1. Verify existing locations of pipe, ductwork equipment and conduit in field.
2. Extend existing systems as required for proper tie-in to new systems.
3. Leave existing equipment to be reused in satisfactory working order.
4. Remove from building all existing piping, ductwork, equipment and similar items which do not conform to new layout. Before disposing of these items, determine if Owner wishes to retain them.

J. Changeovers and continuity of services.

1. Make changeovers, tie-ins, removal, and perform similar work that affect operation of present building at times approved by Owner.
2. Make temporary connections required to keep present building systems and equipment in operation.
3. Prior to any shutdown of present building, have necessary materials at site.

1.06 GENERAL COMPLETION

A. Oiling Equipment.

1. Lubricate equipment and motors in accordance with manufacturer's requirements.

B. Instructions to Owner's Representative.

1. Give notice to Engineer when all systems are installed and operating.
2. Obtain name of Owner's Representative to receive instructions.
3. Schedule instructions of Owner's Representative by manufacturer's representative and instruct Owner in system installation and operation for:

a. Heating, Ventilating & Air Conditioning Equipment.
b. Fan equipment.
c. Pumps.
d. Temperature control.
e. Equipment lubrication.
f. Packaged systems.

C. Provide Operation and Maintenance manuals in accordance with the requirements of Division 1 "Project Closeout" Section. Provide an instructional video to the owner of the training / maintenance instruction sessions with the owner.

1.07 PAINTING AND FINISHING

A. Refer to "Painting" Section 09900 for field painting requirements.

B. Damage and Touch-up: Repair marred and damaged factory painted finishes with materials and procedures to match original factory finish.

1.08 DEMOLITION

A. Disconnect, demolish, and remove work specified under Division 15 and as indicated.

B. Where pipe, ductwork, insulation or equipment to remain is damaged or disturbed, remove damaged portions and install new products of equal capacity and quality.

C. Accessible Work: Remove indicated exposed pipe and ductwork in its entirety.

D. Abandoned Work: Cut and remove buried pipe abandoned in place, 2 inches beyond the face of adjacent construction. Cap and patch surface to match existing finish.

E. Removal: Remove indicated equipment from the project site.

F. Temporary Disconnection: Remove, store, clean, reinstall, reconnect, and make operational equipment indicated for relocation. Add cap off and pressure test prior to putting back in service.

1.09 CUTTING AND PATCHING

A. All cutting required to facilitate the proper installation of all work to be installed under Div. 15, shall be done by Div. 15 contractor.

B. Cut, channel, chase and drill floors, walls, partitions, ceilings and other surfaces necessary for mechanical installations in the maner specified and approved by the architect. Perform cutting by skilled mechanics of the trades involved.

C. Repair cut surfaces to match adjacent surfaces.

1.10 EXCAVATION FOR MECHANICAL WORK

A. Description of Work: Types of excavation for mechanical related work specified in this section include:

1. Underground mechanical utilities and services.
2. Underground tanks, casings and equipment enclosures.
3. Exterior water circulation and distribution systems.

B. Project Conditions.

1. Locate and protect existing utilities and other underground work in manner which will ensure that no damage or service interruption will result from excavating and backfilling. Liabilities arising out of performance of work is responsibility of Contractor doing excavation.
2. Protect persons from injury at excavations by barricades, warnings, and illumination.
3. Provide temporary covering or enclosure and temporary heat as necessary to protect bottoms of excavations from freezing and frost action. Do not install mechanical work on frozen excavation bases or subbases.

1.11 CONCRETE FOR MECHANICAL WORK.

A. Types of concrete for mechanical related work specified in this section include:

1. Lean concrete backfill to support mechanical work.
2. Encasement of mechanical work.
3. Mechanical equipment foundations and housekeeping pads.
4. Inertia bases for isolation of mechanical work.
5. Rough grouting in and around mechanical work.
6. Patching concrete cuts to accommodate mechanical work.
7. Thrust block.

1.12 REBATES

A. The Division 15 Contractor shall assist the Owner in applying for any available rebates from manufacturer's, utility companies, etc. on equipment or materials installed under the contract. Provide all required documentation and assist in the completion of applications as required to complete the rebate process. All proceeds from rebates remain the property of the Owner.

PART 2 – PRODUCTS

Reference Section 03300.

PART 3 - EXECUTION

3.01 EXCAVATION - GENERAL

A. Do not excavate for mechanical work until work is ready to proceed without delay, so that total time lapse from excavation to completion of backfilling will be minimum.

B. Excavate with vertical sided excavations to greatest extent possible, except where otherwise indicated. Where necessary, provide sheeting and cross bracing to sustain sides of excavation. Remove sheeting and cross bracing during backfilling wherever such removal would not endanger work or other property. Where not removed, cut sheeting off at sufficient distance below finished grade to not interfere with other work.

C. Width: Excavate for piping with 6" to 9" clearance on both sides of pipe, except where otherwise shown or required for proper installation of pipe joints, fittings, valves and other work. Excavate for other mechanical work to provide minimum practical but adequate working clearances.

D. Depth for direct support: For work to be supported directly on undisturbed soil, do not excavate beyond indicated depths, and hand excavate bottom cut to accurate elevations, undercut at pipe hubs.

E. Depth for subbase support: For large piping (6" pipe size and larger), tanks, and where indicated for other mechanical work, excavate for installation of subbase material in depth indicated or, if not otherwise indicated, 6" below bottom of work to be supported.

F. Depth for unsatisfactory soil or rock conditions: Where directed, (because of unsatisfactory conditions at bottom of indicated excavation), excavate additional depth as directed to reach satisfactory conditions. Backfill with subbase material, compacted as directed, to indicated excavation depth.

G. Store excavated material (temporarily) near excavation, in manner which will not interfere with or damage excavation or other work. Do not store under trees (within drip line).

1. Dispose of excavated material which is either in excess of quantity needed for backfilling, or does not comply with requirements for backfill material.

    a. Remove unused material from project site, and dispose of in lawful manner.

3.02 WATER CONTROL

A. Maintain dry excavations for mechanical work, by removing water. Protect excavations from inflow of surface water. Pump inflow of ground water from excavations, protect excavations from inflow of ground water, by installing temporary sheeting and waterproofing as well as dewatering as required. Provide adequate barriers which will protect other excavations and below grade property from being damaged by water, sediment or erosion from or through mechanical work excavations. Need permit for dewatering – contractor to obtain and pay for.

3.03 BACKFILLING(REFERENCE 02200)

A. Do not backfill until installed mechanical work has been tested and accepted, wherever testing is indicated.

B. Install drainage fill where indicated, and tamp to uniform firm density.

C. Backfill with finely graded subbase material to 6" above wrapped, coated and plastic piping and tanks, and to centerline of other tanks.

D. Condition backfill material by either drying or adding water uniformly, to whatever extent may be necessary to facilitate compaction to required densities. Do not backfill with frozen soil materials.

E. Backfill simultaneously on opposite sides of mechanical work, and compact simultaneously, do not dislocate work from installed positions.

F. Backfill excavations in 8" high courses of backfill material, uniformly compacted to the following densities (% of maximum density, ASTM D1557), using power-driven hand operated compaction equipment.

    1. Lawn and landscaped areas: 85% for cohesive soils, 90% for cohesionless soil.
    2. Paved areas and roadways: 90% for cohesive soils, 95% for cohesionless soils.

G. Backfill to elevations matching adjacent grades, at time of backfilling excavations for mechanical work. Return surfaces to original condition.

H. After covering piping with 6" layer of approved fill, employ General Contractor to backfill, compact excavations beneath:

1. New foundations.
2. Slabs on grade.
3. Areas to be paved by General Contractor.

3.04 CONCRETE BASES

A. Construct concrete equipment bases of dimensions required, but not less than 4 inches larger in both directions than supported unit. Follow supported equipment manufacturer's setting templates for anchor bolt and tie locations.

3.05 CONCRETE GENERAL

Reference Section 03300.

3.06 CONCRETE CURING AND PROTECTION

Reference Section 03300.

3.07 MISCELLANEOUS CONCRETE ITEMS

A. Fill in holes and openings left in concrete structures for passage of work by trade unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

3.08 CONCRETE SURFACE REPAIRS(REFERENCE 03300)

A. Repair and patch areas with epoxy or non-shrink grout immediately after removal of forms, when acceptable to Architect/Engineer.

B. Repair areas, except single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

C. Use epoxy-based mortar for structural repairs, where directed by Architect/Engineer.

D. Repair methods not specified above may be used, subject to acceptance of Engineer.

3.09 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. Quality Control: Owner's acceptable testing laboratory will perform sampling and testing during concrete placement, which may include the following, as directed by Engineer. This testing

does not relieve Contractor of responsibility of providing concrete in compliance with specifications. Contractor shall perform additional testing as necessary, at no expense to Owner, to ensure quality of concrete.

1. Sampling Fresh Concrete: ASTM.
2. Slump: ASTM, one test for each load at point of discharge.
3. Air Content: ASTM C 173, one for each set of compressive strength (specimens of freshly mixed concrete).
4. Compressive Strength: ASTM, one set for each 50 cu. yds. or fraction thereof of each class and type of concrete; 2 specimens tested at 7 days, 3 specimens tested at 28 days, and one retained for later testing if required.
5. Laboratory Cured Test Cylinders: ASTM.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15014 - CODES, STANDARDS, AND PERMITS

1.01 GENERAL

The entire installation shall be made in accordance with State rules and regulations and shall also conform with the Standards of the National Board of Fire Underwriters for this installation and the local Board of Fire Underwriters having jurisdiction. The installation shall also comply with air pollution requirements of the State of New York and Industrial Code Rule 4 of the State of New York Department of Labor, Board of Standards and Appeals, dated March 31, 1965, and all other ordinances having jurisdiction.

The Contractor shall submit to all authorities having jurisdiction all required applications and shall secure all necessary permits, tests, and inspections required for final approval.

Certain standard and staple materials are described by reference to standard specifications. These standards are as follows:

ASA-B9	Safety Code for Mechanical Refrigeration
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing Materials
AWWA	American Water Works Association
CS	Commercial Standard
FS	Federal Specification
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation
PDI	Plumbing and Drainage Institute
SMACNA	Sheet Metal and Air Conditioning Contractors Association
USASI	United States of America Standards Institute
UL	Underwriters' Laboratories
	New York State Uniform Fire Prevention and Building Code dated January 1, 1989
A.A.B.C.	Associated Air Balance Council
N.E.B.B.	National Environmental Balancing Bureau

All new equipment shall bear U.L. label and conform to the latest edition of the National Electric code.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15050 - BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

A. This Section includes the following basic mechanical materials and methods to complement other Division 15 Sections.

1. Submittals.
2. Welder certification.
3. Pipe joining materials and installation instructions common to piping systems.
4. Piping specialties: Escutcheons, dielectric fittings, sleeves and seals.
5. Identifying devices and labels.
6. Nonshrink grout for equipment installations.
7. Drip pans.
8. Fire stopping.
9. Pipe supports: Hangers, clamps, support spacing, building attachments, shields and saddles, flashing, miscellaneous materials, anchors.
10. Field fabricated metal and wood equipment supports.

B. Pipe and pipe fitting materials are specified in piping system sections.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.03 SUBMITTALS

A. General - Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data for following piping specialties:

1. Mechanical sleeve seals.
2. Identification materials and devices.

C. Samples of color, lettering style and other graphic representation required for each identification material and device.

D. Shop drawings detailing fabrication and installation for metal and wood supports and anchorage for mechanical materials and equipment.

E. Coordination drawings for access panel and door locations.

F. Prepare coordination drawings according to Division 1 Section 01044-"Composite Drawings" to a 1/4 inch equals 1 foot scale or

larger. Detail major elements, components and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Show space requirements for installation and access. Show where sequence and coordination of installations are important to the efficient flow of the Work. Include the following:

1. Proposed locations of piping, ductwork, equipment and materials. Include the following:

    a. Planned piping layout, including valve and specialty locations and valve stem movement.
    b. Planned duct systems layout, including elbows radii and duct accessories.
    c. Clearances for installing and maintaining insulation.
    d. Clearances for servicing and maintaining equipment, including space for equipment disassembly required for periodic maintenance.
    e. Equipment service connections and support details.
    f. Exterior wall and foundation penetrations.
    g. Fire-rated wall and floor penetrations.
    h. Sizes and location of required concrete pads and bases.

G. Floor plans, elevations and details to indicate penetrations in floors, walls and ceilings and their relationship to other penetrations and installations.

H. Reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling-mounted items.

I. Submit weld proceedure specifications.

1.04 WELD AND WELDER CERTIFICATION

A. Welder certificates signed by Contractor certifying that welders comply with requirements of this Section.

B. Qualify welding processes and operators for structural steel according to AWS D1.1 "Structural Welding Code - Steel".

1. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

C. Qualify welding processes and operators for piping according to ASME "Boiler and Pressure Vessel Code", Section IX, "Welding and Brazing Qualifications".

1. Comply with provisions of ASME B31 Series "Code for Pressure Piping".

1.05 Standards for Materials and Workmanship

A. All materials and workmanship shall, at a minimum be inaccordance with (in no order of precedence):

1. New York State Codes – latest edition as adopted by the Authority Having Jurisdiction, unless otherwise noted.

2. State and municipal Building Codes and related subcodes.

3. Occupational and Safety Act (OSHA) Requirements.

4. Rules and Regulations of the Authority Having Jurisdiction applicable to the work.

5. National Electrical Standards Association Standard for Good Workmanship in Electrical Construction (NECA-1)

6. Serving utility's rules and regulations for providing service.

7. Contract Drawings and Specifications.

8. Manufacturer recommended installation instructions, practices and procedures for the products being utilized or installed.

9. Where conflicts arise between the above, the more stringent requirement shall be adhered to.

PART 2 - PRODUCTS

2.01 PIPE AND PIPE FITTINGS

A. Refer to individual piping system specification Sections for pipe and fitting materials and joining methods. Joining methods and pipe installation shall be performed in complete accordance with section 1613 of the Building Code of New York State for building seismic type II, zone C.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.02 PIPE JOINING MATERIALS

A. Refer to individual piping system specification Sections in Division 15 for special joining materials not listed below.

B. Pipe Flange Gasket Materials: Suitable for the chemical and thermal conditions of the piping system contents.

1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8 inch maximum thickness, except where thickness or specific material is indicated.

a. Full-Face Type: for flat-face, Class 125 cast-iron and cast-bronze flanges.
b. Narrow-Face Type: for raised-face, Class 250 cast-iron and steel flanges.

2. ASME B16.20 for grooved, ring-joint, steel flanges. Note that grooved, ring joint piping / accessories may be used for sprinkler or condenser water piping systems only.
3. AWWA C110, rubber, flat face, 1/8 inch thick, except where other thickness is indicated; and full-face or ring type, except where type is indicated.

C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, except where other material is indicated.

D. Solder Filler Metal: ASTM B 32.

1. Alloy Sn95 or Alloy Sn94: Tin (approximately 95 percent) and silver (approximately 5 percent).
3. Alloy E: Tin (approximately 95 percent) and copper (approximately 5 percent).
4. Allow HA: Tin-antimony-silver-copper-zinc.
5. Alloy HB: Tin-antimony-silver-copper-nickel.
6. Alloy Sb5: Tin (95 percent) and antimony (5 percent).

E. Brazing Filler Metals: AWS A5.8.

1. BCuP Series: Copper-phosphorus alloys.
2. BAg1: Silver alloy.

F. Welding Fill Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

G. Flanged, Ductile-Iron Pipe Gasket, Bolts and Nuts: AWWA C110, rubber gasket, carbon steel bolts and nuts.

H. Couplings: Iron body sleeve assembly, fabricated to match outside diameters of plain-end, pressure pipes.

1. Sleeve: ASTM A 126, Class B, gray iron.
2. Followers: ASTM A 47, Grade 32510 or ASTM A 536 ductile iron.
3. Gaskets: Rubber.
4. Bolts and Nuts: AWWA C111.
5. Finish: Enamel paint.

2.03 PIPING SPECIALTIES

A. Escutcheons: Manufactured wall, ceiling and floor plates; deep-pattern type, where required to conceal protruding fittings and sleeves.

1. Inside Diameter: Closely fit around pipe, tube and insulation of insulated piping.
2. Outside Diameter: Completely cover opening.
3. Cast Brass: One-piece, with set-screw.

    a. Finish: Rough brass.
    b. Finish: Polished chrome plate.

4. Cast Brass: Split casting, with concealed hinge and set-screw.

    a. Finish: Rough brass.
    b. Finish: Polished chrome plate.

5. Stamped Steel: One-piece, with set screw and chrome plated finish.
6. Stamped Steel: One-piece with spring clips and chrome plated finish.
7. Stamped Steel: Split plate with concealed hinge, set-screw, and chrome plated finish.
8. Stamped Steel: Split plate with concealed hinge, spring clips and chrome plated finish.
9. Cast-Iron Floor Plate: One piece casting.

B. Dielectric Fittings: Assembly or fitting having insulating material isolating joined dissimilar metals, to prevent galvanic action and stop corrosion.

1. Description: Combination of copper alloy and ferrous; threaded, solder, plain, and weld neck end types and matching piping system materials.
2. Insulating Material: Suitable for system fluid, pressure and temperature.
3. Dielectric Unions: Factory-fabricated, union assembly, for 250 psig minimum working pressure at 180 deg F temperature.
4. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150 or 300 psig minimum pressure to suit system pressures.
5. Dielectric-Flange Insulation Kits: Field-assembled, companion-flange assembly, full face or ring type. Components include neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers and steel backing washers.

    a. Provide separate companion flanges and steel bolts and nuts for 150- or 300-psig minimum working pressure to suit system pressures.

6. Dielectric Couplings: Galvanized steel coupling, having inert and non-corrosive, thermoplastic lining, with threaded ends and 300 psig minimum working pressure at 225 deg F temperature.
7. Dielectric Nipples: Electroplated steel nipple, having inert and non-corrosive, thermoplastic lining, with combination of plain or threaded end types and 300 psig working pressure at 225 deg F temperature.

C. Mechanical Sleeve Seals: Modular, watertight, mechanical type. Components include interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve. Connecting bolts and pressure plates cause rubber sealing elements to expand when tightened.

D. Sleeves: The following materials are for wall, floor, slab and roof penetrations.

1. Steel Sheet-Metal: 24 gage or heavier, galvanized sheet metal, round tube closed with welded longitudinal joint.
2. Steel Pipe: ASTM A53, Type E, Grade A, Schedule 40, galvanized, plain ends.
3. Cast-Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, having plain ends and integral water stop, except where other features are specified.
4. Wall Penetration Systems: Wall sleeve assembly, consisting of housing, gaskets and pipe sleeve, with 1 mechanical-joint end conforming to AWWA C110 and 1 plain pipe-sleeve end.

    a. Penetrating Pipe Deflection: In accordance with International Building Code (latest edition), Chapter 16: seismic requirements, without leakage.
    b. Housing: Ductile-iron casting having waterstop and anchor ring, with ductile-iron gland, steel studs and nuts, and rubber gasket conforming to AWWA C111 of housing and gasket size as required to fit penetrating pipe.
    c. Pipe Sleeve: AWWA C151, ductile-iron pipe.
    d. Housing-to-Sleeve Gasket: Rubber or neoprene, push-on type, of manufacturer's design.
5. Cast-Iron Sleeve Fittings: Commercially-made, sleeve having integral clamping flange, with clamping ring, bolts and nuts for membrane flashing.

    a. Underdeck Clamp: Clamping ring with set screws.

2.04 IDENTIFYING DEVICES AND LABELS

A. General: Manufacturer's standard products of categories and types required for each application as referenced in other Division 15 Sections. Where more than single type is specified for listed application, selection is Installer's option, but provide single selection for each product category.

B. Equipment Nameplates: Metal nameplate with operational data engraved or stamped; permanently fastened to equipment.

1. Data: Manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data.
2. Location: An accessible and visible location.

C. Snap-On Plastic Pipe Markers: Manufacturer's standard pre-printed, semi-rigid snap-on, color-coded pipe markers, conforming to ASME A13.1.

D. Pressure-Sensitive Pipe Markers: Manufacturer's standard pre-printed, permanent adhesive, color-coded, pressure-sensitive vinyl pipe markers, conforming to ASME A13.1.

E. Plastic Duct Markers: Manufacturer's standard laminated plastic, color coded duct markers. Conform to following color code:

1. Green: Cold air.
2. Yellow: Hot air.
3. Yellow/Green: Supply air.
4. Blue: Exhaust, outside, return and mixed air.
5. For hazardous exhausts, use colors and designs recommended by ASME A13.1.
6. Nomenclature: Include following:

    a. Direction of air flow.
    b. Duct service (supply, return, exhaust, etc.).
    c. Duct origin (from).
    d. Duct destination (to).
    e. Design cfm.

F. Engraved Plastic-Laminate Signs: ASTM D 709, Type I, cellulose, paper-base, phenolic-resin-laminate engraving stock: Grade ES-2, black surface, black phenolic core, with white (letter color) melamine subcore, except when other colors are indicated.

1. Fabricate in sizes required for message.
2. Engraved with engraver's standard letter style, of sizes and with wording to match equipment identification.
3. Punch for mechanical fastening.
4. Thickness: 1/16 inch, except as otherwise indicated.
5. Thickness: 1/8 inch, except as otherwise indicated.
6. Thickness: 1/16 inch, for units up to 20 square inches or 8-inches long; 1/8 inch for larger units.
7. Fasteners: Self-tapping stainless-steel screws or contact-type permanent adhesive.

G. Plastic Equipment Markers: Laminated-plastic, color-coded equipment markers. Conform to following color code:

1. Green: Cooling equipment and components.
2. Yellow: Heating equipment and components.
3. Yellow/Green: Combination cooling and heating equipment and components.
4. Brown: Energy reclamation equipment and components.
5. Blue: Equipment and components that do not meet any of above criteria.
6. For hazardous equipment, use colors and designs recommended by ASME A13.1.
7. Nomenclature: Include following, matching terminology on schedules as closely as possible:

    a. Name and plan number.
    b. Equipment service.

c. Design capacity.
d. Other design parameters such as pressure drop, entering and leaving conditions, and rpm.

8. Size: Approximately 2-1/2 by 4 inches for control devices, dampers, and valves; and 4-1/2 by 6 inches for equipment.

H. Underground Type Plastic Line Marker.

1. Manufacturer's standard permanent, bright colored, continuous printed plastic tape, intended for direct burial service, not less than 6" wide x 4 mils thick. Provide tape with printing which most accurately indicates type of service of buried pipe.

I. Lettering and Graphics: Coordinate names, abbreviations and other designations used in mechanical identification, with corresponding designations indicated. Use numbers, lettering and wording indicated for proper identification and operation/maintenance of mechanical systems and equipment.

1. Multiple Systems: Where multiple systems of same generic name are indicated, provide identification that indicates individual system number as well as service such as "Boiler No. 3", "Air Supply No. 1H", or "Standpipe F12".

2.05 GROUT

A. Nonshrink, Nonmetallic Grout: ASTM C1107, Grade B.

1. Characteristics: Post-hardening, volume-adjusting, dry, hydraulic-cement grout, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
2. Design Mix: 5000 psi, 28-day compressive strength.
3. Packaging: Premixed and factory-packaged.

2.06 DRIP PANS

A. Provide drip pans fabricated from corrosion resistant sheet metal with watertight joints, and with edges turned up 2-1/2 inches. Reinforce top, either by structural angles or by folding over according to size. Provide hole, gasket, and flange at low point for watertight joint and 1-inch drain line connection.

2.07 FIRE STOPPING

A. Refer to Specification Section 15511 for details.

2.08 HORIZONTAL PIPING HANGERS AND SUPPORTS

A. General: Except as otherwise indicated, provide factory fabricated horizontal piping hangers and supports. Supports and hangers in conformance with International Building Code (latest

edition), Chapter 16: seismic requirements shall be used. Use only one type by one manufacturer for each piping service. Select size of hangers and supports to exactly fit pipe size for bare piping, and to exactly fit around piping insulation with saddle or shield for insulated piping. Provide copper plated hangers and supports for copper piping systems. Provide spring hangers where piping is subject to vibration movement.

B. Adjustable steel clevises.

1. Material: Carbon steel, copper plated for copper piping.
2. Finish: Black or copper plated.
3. Adjustment: Hanger to be adjustable for vertical height of pipe without removing the pipe.

2.09 VERTICAL PIPING CLAMPS

A. Two bolt riser clamp.

1. Material: Carbon steel copper plated for copper piping.
2. Finish: Black or copper plated.

2.10 HANGER ROD AND SPACING

ROD SIZE AND SPACING SCHEDULE (In accordance with NYSBC 1621)

PIPE SIZE	ROD DIAMETER
2" and smaller	3/8"
2-1/2" thru 3-1/2"	1/2"
4" thru 5"	5/8"
6" and over	3/4"

TYPE	MAXIMUM SPACING
Steel	10’ -0"
Copper	6’- 0"

Note: Cast Iron - support at every hub or coupling 5 ft. maximum spacing.

2.11 BUILDING ATTACHMENTS

A. General: Except as otherwise indicated provide factory fabricated building attachments of one of the following types listed, selected by Installer to suit building substrate conditions. Select size of building attachments to suit hanger rods. Provide copper plated building attachments for copper piping systems. Provide the following where approved by International Building Code (latest edition), Chapter 16:

B. On Structural Steel:

1. For pipes 2" and smaller: C clamps with lock nuts similar to Grinnell figure 86.
2. For pipes 5" and larger: Use beam clamps similar to Grinnell figure 228 or 292.

C. On New Masonry:

1. Use concrete inserts similar to Grinnell figure 281.

D. On Existing Concrete:

1. Use expansion case similar to Grinnell figure 117.

E. On Wood:

1. Use coach screw rods Grinnell figure 111. Ceiling flanges Grinnell figure 153, or fabricated angle clips. Use wood drive screws or lag bolts as fasteners.

2.12 SHIELDS AND SADDLES (Where approved by International Building Code (latest edition), Chapter 16:)

A. General: For insulated piping.

B. Shields: 16 gauge galvanized metal.

Unsul Coustic Corp. "Insul-Shield"

C. Protection saddles:

1. Hardwood block
2. Steel saddle Grinnell 160 series

2.13 FLASHING MATERIALS

A. General: Provide flashings for each penetration of mechanical systems through roofs or waterproof membranes.

B. Molded Pipe Flashing: Compatible with single ply membranes with which it is used and manufactured by membrane manufacturer.

C. Copper flashing: Provide cold-rolled sheet copper (ANSI/ASTM B 370), of proper temper for applications shown and required forming, coated on one side with not less than 0.06 lbs. per sq. ft. of antimony (ANSI/ASTM B 101, Type I, Class A), weighing 1.06 lbs. per sq. ft., except as otherwise indicated.

D. Bituminous coating: FS TT-C-494, or MIL-C-18480, or SSPC-Paint 12, cold applied solvent type bituminous mastic coating for application in dry film thickness of 15 mils per coat.

2.14 MISCELLANEOUS MATERIALS

A. Metal framing: Provide products complying with NEMA STD ML 1.

B. Steel plates, shapes and bars: Provide products complying with ANSI/ASTM A 36.

C. Heavy duty steel trapezes: Fabricate from steel shapes selected for loads required, weld steel in accordance with AWS standards.

D. Pipe guides: Provide factory fabricated guides, of cast semi-steel or heavy fabricated steel, consisting of a bolted two section outer cylinder and base with a two section guiding spider bolted tight to pipe. Size guide and spiders to clear pipe and insulation (if any), and cylinder. Provide guides of length recommended by manufacturer to allow indicated travel.

2.15 ANCHORS

A. Fabricate pipe anchors from 3 x 3 x 1/2" angle.

B. Use pipe protection saddles one size larger than piping.

PART 3 - EXECUTION

3.01 PIPING SYSTEMS - COMMON REQUIREMENTS

A. General: All piping systems, components and their installation shall be in conformance with the International Building Code (latest edition), Chapter 16: for seismic requirements. Install piping as described below, except where system Sections specify otherwise. Individual piping system specification Sections in Division 15 specify piping installation requirements unique to the piping system.

B. General Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing and other design considerations. Install piping as indicated, except where deviations to layout are approved on coordinate drawings.

C. Install piping at indicated slope.

D. Install components having pressure rating equal to or greater than system operating pressure.

E. Install piping in concealed interior and exterior locations, except in equipment rooms and service areas.

F. Install piping free of sags and bends.

G. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, except where indicated.

H. Install piping tight to slabs, beams, joists, columns, walls and other building elements. Allow sufficient space above removable ceiling panels to allow for ceiling panel removal.

I. Install piping to allow application of insulation plus 1-inch clearance around insulation.

J. Locate groups of pipes parallel to each other, spaced to permit valve servicing.

K. Install fittings for changes in direction and branch connections.

L. Install couplings according to manufacturer's printed instructions.

M. Install pipe escutcheons for pipe penetrations of concrete and masonry walls, wallboard partitions and suspended ceilings according to the following:

1. Chrome-Plated Piping: Cast-brass, one-piece, with set-screw and polished chrome-plated finish. Use split-casting escutcheons where required, for existing piping.
2. Uninsulated Piping Wall Escutcheons: Cast-brass or stamped-steel, with set-screw.
3. Uninsulated Piping Floor Plates in Utility Areas: Cast-iron floor plates.
4. Insulated Piping: Cast-brass or stamped-steel, with concealed hinge, spring clips and chrome-plated finish.
5. Piping in Utility Areas: Cast-brass or stamped-steel with set-screw or spring clips.

N. Sleeves are required for core drilled holes.

O. Permanent sleeves are not required for holes formed by PE plastic (removable) sleeves.

P. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, concrete floor and roof slabs and where indicated.

1. Cut sleeves to length for mounting flush with both surfaces.

    a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring where specified.

2. Build sleeves into new walls and slabs as work progresses.

3. Install large enough sleeves to provide 1/4 inch annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:

a. Steel Sheet-Metal Sleeves: For pipes 6 inches and larger, penetrating gypsum-board partitions.
b. Cast-Iron Sleeve Fittings: For floors having membrane waterproofing. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level. Flashing is specified in Division 7 Section "Flashing and Sheet Metal".
c. Seal space outside of sleeve fittings with nonshrink, nonmetallic grout.

4. Except for below-grade wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using elastomeric joint sealants specified in Division 7 Section "Joint Sealants".

Q. Above Grade, Exterior Wall, Pipe Penetrations: Seal penetrations using sleeve and mechanical sleeve seals. Size sleeve for 1 inch annular clear space between pipe and sleeve for installation of mechanical seals.

1. Install steel pipe for sleeves smaller than 6 inches.
2. Install cast-iron "wall pipes" for sleeves 6 inches and larger.
3. Assemble and install mechanical seals according to manufacturer's printed instructions.

R. Below Grade, Exterior Wall, Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Size sleeve for 1-inch annular clear space between pipe and sleeve for installation of mechanical seals.

S. Below Grade, Exterior Wall, Pipe Penetrations: Install ductile-iron wall penetration system sleeves according to manufacturer's printed installation instructions.

T. Verify final equipment locations for roughing-in.

U. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

V. Piping Joint Construction: Joint pipe and fittings as follows and as specifically required in individual piping system specification Sections.

1. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
2. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
3. Soldered Joints: Construct joints according to AWS "Soldering Manual", Chapter 22 "The Soldering of Pipe and Tube".
4. Brazed Joints: Construct joints according to AWS "Brazing Manual", Chapter 28 "Pipe and Tube".

5. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full inside diameter. Join pipe fittings and valves as follows:

    a. Note the internal length of threads in fittings or valve ends and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.
    b. Apply appropriate tape or thread compound to external pipe threads (except where dry seal threading is specified).
    c. Align threads at point of assembly.
    d. Tighten joint with wrench. Apply wrench to valve end into which pipe is being threaded.
    e. Damaged Threads: Do not use pipe or pipe fittings having threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

W. Welded Joints: Construct joints according to AWS D10.12 "Recommended Practices and Procedures for Welding Low Carbon Steel Pipe" using qualified processes and welding operators according to "Quality Assurance" article.

X. Flanged Joints: Align flange surfaces parallel. Select appropriate gasket concentrically positioned. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly using torque wrench.

1. Fitting Heat-Fusion Joints: Prepare pipe and fittings and join with heat-fusion equipment, according to manufacturer's printed instructions.

    a. Plain-End Pipe and Socket-Type Fittings: Socket-joining.

Z. Piping Connections: Except as otherwise indicated, make piping connections as specified below.

1. Install unions, in piping 2 inches and smaller, adjacent to each valve and at final connection to each piece of equipment having 2 inches or smaller threaded pipe connection.
2. Install flanges, in piping 2 1/2 inches and larger, adjacent to flanged valves and at final connection to each piece of equipment having flanged pipe connection.
3. Dry Piping Systems (Gas, Compressed Air, and Vacuum): Install dielectric unions and flanges to connect piping materials or dissimilar metals.
4. Wet Piping Systems (Water and Steam): Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.02 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to provide the maximum possible headroom, where mounting heights are not indicated. Equipment platforms, vibration isolation and restraints shall be provided and installed where described and shall be in conformance with International Building Code (latest edition), Chapter 16:

B. Install equipment according to approved submittal data. Portions of the Work are shown only in diagrammatic form. Refer conflicts to the Architect.

C. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, except where otherwise indicated.

D. Install mechanical equipment to facilitate servicing, maintenance and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.

E. Install equipment giving right-of-way to piping systems installed at a required slope.

3.03 LABELING AND IDENTIFYING

A. Piping Systems: Install pipe markers on each system. Include arrows showing normal direction of flow.

1. Plastic markers, with application systems. Install on pipe insulation segment where required for hot non-insulated pipes.

2. Locate pipe markers as follows wherever piping is exposed in finished spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) and exterior non-concealed locations.

a. Near each valve and control device.
b. Near each branch, excluding short take-offs for fixtures and terminal units. Mark each pipe at branch, where flow pattern is not obvious.
c. Near locations where pipes pass through walls, floors, ceilings, or enter non-accessible enclosures.
d. At access doors, manholes and similar access points that permit view of concealed piping.
e. Near major equipment items and other points of origination and termination.
f. Spaced at a maximum of 50 feet intervals along each run. Reduce intervals to 25 feet in congested areas of piping and equipment.
g. On piping above removable acoustical ceilings, except omit intermediately spaces markers.

3. During back-filling/top-soiling of each exterior underground piping systems, install continuous underground type plastic line marker, located directly over buried line

at 6-inches to 8-inches below finished grade. Where multiple small lines are buried in common trench and do not exceed overall width of 16-inches, install single line marker. For tile fields and similar installations, mark only edge pipe lines of field.

B. Equipment: Install engraved plastic laminate sign or equipment marker on or near each major item of mechanical equipment.

1. Lettering Size: Minimum 1/4 inch high lettering for name of unit where viewing distance is less than 2 feet, 1/2 inch high for distance up to 6 feet, and proportionately larger lettering for greater distances. Provide secondary lettering 2/3 to 3/4 of size of principal lettering.

2. Text of Signs: Provide text to distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to name of identified unit.

C. Duct Systems: Identify air supply, return, exhaust, intake and relief ducts with duct markers, or provide stenciled signs and arrows, showing duct system service and direction of flow.

1. Location: In each space where ducts are exposed or concealed by removable ceiling system, locate signs near points where ducts enter into space and at maximum intervals of 50 feet.

D. Adjusting: Relocate identifying devices which become visually blocked by work of this Division or other Divisions.

3.04 ERECTION OF METAL SUPPORTS AND ANCHORAGE

A. Provide and install in conformance with International Building Code (latest edition), Chapter 16: Cut, fit and place miscellaneous metal supports accurately in location, alignment and elevation to support and anchor mechanical materials and equipment.

B. Field Welding: Comply with AWS D1.1 "Structural Welding Code - Steel".

3.05 ERECTION OF WOOD SUPPORTS AND ANCHORAGE

A. Cut, fit and place wood grounds, nailers, blocking, and anchorage to support and anchor mechanical materials and equipment.

B. Select fastener sizes that will not penetrate members where opposite side will be exposed to view or will receive finish

materials. Make tight connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

3.06 GROUTING

A. Install nonmetallic, nonshrink, grout for mechanical equipment base bearing surfaces, pump and other equipment base plates, and anchors. Mix grout according to manufacturer's printed instructions.

B. Clean surfaces that will come into contact with grout.

C. Provide forms for placement of grout, as required.

D. Avoid air entrapment when placing grout.

E. Place grout, completely filling equipment bases.

F. Place grout on concrete bases to provide a smooth bearing surface for equipment.

G. Place grout around anchors.

H. Cure placed grout according to manufacturer's printed instructions

3.07 DRIP PANS

A. Locate drip pans under piping passing over or within 3 ft. horizontally of electrical equipment, and elsewhere as indicated. Hang from structure with rods and building attachments, and weld rods to sides of drip pan.
Brace to prevent sagging or swaying. Connect 1-inch drain line to drain connection, and run to nearest plumbing drain or elsewhere as indicated.

3.08 FIRESTOPPING

A. See section 15511 for additional fire stopping requirements.

3.09 INSTALLATION OF BUILDING ATTACHMENTS

A. Install building attachments at required locations in concrete, in wood or on structural steel for proper piping support. Space attachments within maximum piping span length indicated. Install additional building attachments where support is required for additional concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed, fasten insert securely to forms. Where concrete with compressive strength less than 2500 psi is indicated, install reinforcing bars through openings at top of inserts.

3.10 INSTALLATION OF HANGERS AND SUPPORTS

A. General: Install hangers, supports, clamps and attachments to support piping properly from building structure. Supports / hangers shall conform to the requirements of International Building Code (latest edition), Chapter 16: Arrange for grouping of parallel runs of horizontal piping to be supported together on trapeze type hangers where possible. Where piping of various sizes is to be supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe. Do not use wire or perforated metal to support piping, and do not support piping from other piping.

B. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers and other accessories. Install hangers and supports of same type and style for grouped piping runs.

C. Support fire water piping independently of other piping.

D. Prevent electrolysis in support of copper tubing by use of hangers and supports which are copper plated.

E. Provisions for movement: International Building Code (latest edition), Chapter 16:

1. Install hangers and supports to allow controlled movement of piping systems and to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.
2. Load distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
3. Pipe slopes: Install hangers and supports to provide indicated pipe slopes.

F. Adjust hangers and supports and place grout as required under supports to bring piping to proper levels and elevations.

3.11 SHIELDS AND SADDLES FOR INSULATED PIPING

A. 4" and below use 16 gauge x 12 inch long shield with oversized hanger outside insulation.

B. 6" and above use hardwood protection saddle with 16 gauge x 18 inch long shield with oversized hanger outside insulation.

C. 6" and above use steel protection saddle. Fill void between shield and pipe with insulation. Cover with vapor barrier. Protect barrier with 16 gauge x 18 inch long shield with oversized hanger outside assembly.

3.12 INSTALLATION OF ANCHORS

A. Install anchors at proper locations to prevent stresses and to prevent transfer of loading and stresses to connected equipment.

B. Fabricate and install anchor by welding steel shapes, plates and bars to piping and to structure.

C. Where expansion compensators are indicated, install anchors in accordance with expansion unit manufacturer's written instructions, to limit movement of piping and forces to maximums recommended by manufacturer for each unit.

D. Anchor spacings: Where not otherwise indicated, install anchors at ends of principal pipe-runs, at intermediate points in pipe-runs between expansion loops and bends. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.

3.13 FLASHINGS

A. Manufacturer's recommendations: Except as otherwise shown or specified, comply with recommendations and instructions of manufacturer of sheet metal being installed.

B. Coat back side of flashings where in contact with concrete and other cementitious substrates, by painting surface in area of contact with heavy application of bituminous coating, or by other permanent separation as recommended by manufacturer of metal.

C. On vertical surfaces, lap flashings minimum of 3".

D. On sloping surfaces, for slopes of not less than 6" in 12", lap unsealed flashings minimum of 6".

E. For embedment of metal flashing flanges in roofing or composition flashing or stripping, extend flanges minimum of 6" for embedment.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15100 - VALVES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of valves required by this section is indicated on drawings and/or specified in other Division 15 sections.

B. Types of valves specified in this section include the following:

1. Gate valves.
2. Globe valves
3. Drain valves.
4. Ball valves.
5. Butterfly valves (where specifically approved by engineer only).
6. Check valves.

    a. Wafer Check (where specifically approved by engineer only).

1.03 QUALITY ASSURANCE

A. Marking of valves - comply with MSS SP-25.

B. Valve dimensions - for face-to-face and end-to-end dimensions of flanged or welding end valve bodies, comply with ANSI B16.10.

C. ASME Compliance: ASME 1331.9 for Building Services Piping.

D. Valve types. Provide valves of same type by same manufacturer.

1.04 SUBMITTALS

A. Product data - submit catalog cuts, specifications, installation instructions, and dimensioned drawings for each type of valve. Include pressure drop curve or chart for each type and size of valve. Submit valve schedule showing manufacturer's figure number, size, location and valve features for each required valve.

B. Maintenance data - submit maintenance data and spare parts lists for each type of valve. Include this data in Maintenance Manual.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Handle valves and components carefully to prevent damage, breaking, denting and scoring. Do not install damaged valves or components, replace with new.

B. Store valves and components in clean dry place. Protect from weather, dirt, fumes, water, construction debris, and physical damage.

PART 2 - PRODUCTS

2.01 GENERAL

A. Provide factory fabricated valves recommended by manufacturer for use in service indicated. Provide valves of types and pressure ratings indicated, provide proper selection as determined by installer to comply with installation requirements. Provide sizes as indicated, and connections which properly mate with pipe, tube and equipment connections. Where more than one type is indicated, selection is engineer’s option.

B. Valve Features

1. Bypass- when shown provide manufacturer's standard bypass piping and valving.
2. Drain - when shown provide threaded pipe plugs complying with Division 15 "Hot & Chilled water piping" section.
3. Flanged - valve flanged complying with ANSI B16.1 (cast iron), ANSI B16.5, (steel), or ANSI B16.24 (bronze).
4. Threaded - valve ends complying with ANSI B2.1
5. Solder joint - valve ends complying with ANSI B16.18.
6. Trim - fabricate pressure containing components of valve, including stems (shafts) and seats from brass or bronze materials, of standard alloy recognized in valve manufacturing industry.
7. Renewable seat - design seat of valve with removable disc, and assemble valve so disc can be replaced when worn.
8. Extended stem - increase stem length 2" minimum, to accommodate insulation applied over valve.

C. Valve Definitions

1. Mechanical actuator - factory fabricated gears, gear enclosure, external chain attachment and chain designed to provide mechanical advantage in operating valve.
2. Bonnet - part of gate or globe valve through which stem passes to valve body, and attached to valve body by screws, bolts union, or welding.
3. Solid wedge - one piece tapered disc in gate valve, designed for contact on both sides.
4. Outside screw and yoke (OS&Y) - stem and handwheel designed to rise out of bonnet or yoke as valve is operated from closed to open position.
5. Inside screw, non-rising stem - stem and handwheel designed to rotate without rising when valve is operated from closed to open position.
6. Tight shutoff - butterfly valve designed for flow regulation, and manufactured to be tight in closed position.

2.02 GLOBE VALVES

A. Packing - select valves designed for repacking under pressure when fully opened, equipped with packing suitable for intended service. Select valves designed so back seating protects packing and stem threads from fluid when valve is fully opened, and equipped with gland follower.

B. Composition discs - where required, provide suitable material for intended service. For stem throttling service, fit composition disc valve with throttling nut. For metal seated globe valves, provide hardened stainless steel disc and seat ring.

C. Comply with the following standards:

1. Cast iron valves - MSS SP-85.
2. Bronze valves - MSS SP-80.
3. Steel valves - ANSI B16.34.

D. For HVAC hot and chilled water service:

1. Threaded ends 2" and smaller - Class 150, bronze body, union bonnet, rising stem, composition disc.
2. Soldered ends 2" and smaller - Class 125, bronze body, screwed bonnet, rising stem, composition disc.
3. Flanged ends 2 1/2" and larger - Class 125, iron body, bolted bonnet, rising stem, OS&Y, renewable seat and disc.

E. Manufacturer - subject to compliance with requirements, provide globe valves of one of the following:

1. Jenkins Bros, A Corp.
2. Kennedy Valve
3. Stockham Valves and Fittings, Inc.

2.03 DRAIN VALVES

A. For low pressure drainage service:

1. Threaded ends 2" and smaller - Class 125, bronze body, screwed bonnet, rising stem, composition disc, 3/4" hose outlet connection.
2. Soldered ends 2" and smaller - Class 125, bronze body, screwed bonnet, rising stem, composition disc, 3/4" hose outlet connection.

B. Manufacturer - subject to compliance with requirements, provide drain valves of one of the following:

1. NIBCO, Inc.
2. Watts

2.04 BALL VALVES

A. Comply with the following standards:

1. Cast iron valves - MSS SP-72.
2. Steel valves - ANSI B16.34.

B. For HVAC hot and chilled water service:

1. Threaded ends 2" and smaller - Class 125, bronze 2 piece body, full port, bronze ball, bronze stem.
2. Soldered ends 2" and smaller - Class 125, bronze 2 piece body, full port, bronze ball, bronze stem.

C. Manufacturer - subject to compliance with requirements, provide ball valves of one of the following:

1. Jenkins Bros.
2. Stockham Valves & Fittings
3. Watts

2.05 BUTTERFLY VALVES (only where specifically approved by the engineer)

A. General - comply with MSS SP-67. Valves to be tight shutoff.

Where butterfly valves are used as shutoffs for terminal or equipment removal or repair, select lug type valves. Select wafer type valves for other applications. Provide gear operators on butterfly valves 8" and larger.

B. For HVAC hot and chilled water service:

1. Lug type 3" and larger - Class 150, ductile iron body, lever operated, cadmium plated ductile iron disc, Type 316 stainless steel stem, EPT or EPDM seat.

C. Manufacturer - subject to compliance with requirements, provide butterfly valves of one of the following:

1. Demco Inc.
2. Jenkins Bros., A Corp.
3. Mark Controls Corp., MCC Centerline.
4. Stockham Valves and Fittings, Inc.
5. Crane Co., Valve Division

2.06 WAFER CHECK VALVES (only where specifically approved by the engineer)

A. General - provide wafer style, butterfly type, spring actuated check valves designed to be installed with gaskets between two standard Class 125 flanges. Construct iron body valves with pressure containing parts of materials conforming to ANSI/ASTM A-126, Grade B. Support hanger pins on both ends by removable side plugs.

B. For water service:

1. 2" and larger - Class 125, cast iron body, stainless steel trim, bronze disc, Buna-N seal.

C. Manufacturer - subject to compliance with requirements, provide wafer check valves of one of the following:

1. Bell & Gossett, ITT Fluid Handling Div.
2. Metraflex Co.
3. NIBCO, Inc.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General - except as otherwise indicated, comply with the following requirements:

1. Install valves where required for proper operation of piping and equipment, including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary.
2. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward for horizontal plane unless unavoidable. Install valve drains with hose end adapter for each valve that must be installed with stem below horizontal plane.

B. Insulation - where insulation is indicated, install extended stem valves, arranged in proper manner to receive insulation.

C. Applications subject to shock - install valves with bodies of metal other than cast iron where thermal or mechanical shock is

indicated or can be expected to occur.

D. Applications subject to corrosion - do not install bronze valves and valve components in direct contact with steel, unless bronze and steel are separated by dielectric insulator. Install bronze valves in steam and condensate service and in other services where corrosion is indicated or can be expected to occur.

E. Mechanical actuators - install mechanical actuators with chain operators where indicated, and where valves 4" and larger are mounted more than 7'-0" above floor in mechanical rooms, boiler rooms, and where recommended by valve manufacturer because of valve size, pressure differential or other operating condition making manual operation difficult.

F. Selection of valve ends (pipe connections) - except as otherwise indicated, select and install valves with the following ends or types of pipe/tube connections.

1. Copper tube size 2" and smaller - soldered joint valves except ball valves used in plumbing systems.
2. Steel pipe, size 2" and smaller - threaded valves.
3. Pipe size 2 1/2" and larger - flanged valves.

G. Valve system - select and install valves with outside screw and yoke stems, except provide inside screw non-rising stem valves where headroom prevents full opening of OS&Y valves.

H. Non-metallic disc - limit selection and installation of valves with non-metallic discs to locations indicated and where foreign material in piping system can be expected to prevent tight shutoff of metal seated valves.

I. Renewable seats - select and install valves with renewable seats, except where otherwise indicated.

J. Fluid control - except as otherwise indicated, install gate, ball, globe, and butterfly valves to comply with ANSI B31.1. Where throttling is indicated or recognized as principal reason for valve, install globe or butterfly valves.

K. Installation of Check valves: Wafer check valves – install between two flanges in horizontal or vertical position for proper direction of flow.

END OF SECTION

DIVISION 15 – MECHANICAL

SECTION 15135 - THERMOMETERS AND GAGES

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Thermometers and gages specified in this section include the following:

1. Thermometers and fittings:
2. Pressure gages and fittings:

PART 2 - PRODUCTS

2.01 THERMOMETERS

A. Thermometers:

1. General: Provide and install adjustable, variable angle type thermometers of materials, capacities and ranges indicated.
2. Case: Die cast aluminum finished in baked epoxy enamel, glass front, 9 inches long.
3. Adjustable joint: 180 degree adjustment in vertical plane, 360 degree adjustment in horizontal plane, with locking device.
4. Tube and capillary: Blue liquid filled, magnifying lens, 1-percent scale range accuracy, shock mounted. (Mercury filled not acceptable).
5. Scale: Satin faced, non-reflective aluminum, permanently etched markings.
6. Stem: Copper plated steel, or brass, for separable socket.
7. Range: Conform to the following:

    a. Hot water: 30 to 240 degrees F with 2 degree F scale divisions.
    b. Chilled water: 30 to 180 degrees F with 2 degrees F scale divisions.

8. Manufacturer:

    a. Wika
    b. Trerice
    c. Weiss
    d. Or approved equal

B. Dial Thermommeters:

1. General – Provide dial bimetal type adjustable angle thermometers of materials, capacities and ranges indicated, designed and constructed for use in service indicted.
2. Case – Type 300 series stainless steel hermetically sealed.

3. Dial – White finished aluminum with black and blue marking.
4. Pointer – balanced aluminum with black finish.
5. Stem – type 300 series stainless steel 1/4"o.d.internal bimetal coil silicone dampened.
6. Range – conform to the following:

   a. Hot water 20° to 240° F. scale divisions.

7. Manufacturer – subject to compliance with requirements, provide glass thermometers of one of the following:

   a. Tel-Tru Mfg. Co.
   b. Trerice (H.O.) Co.
   c. Weiss Instrument Inc.

B. Thermometer wells:

1. General: Provide thermometer wells of brass or stainless steel, pressure rated to match piping system design pressure. Provide 2 inch extension for insulated piping. Provide cap nut with chain fastened permanently to thermometer well.
2. Manufacturer: Same as thermometers.

2.02 PRESSURE GAGES AND FITTINGS

A. Pressure gages:

1. General: Provide "AA" industrial rated liquid filled pressure gages of capacities and ranges indicated, designed and constructed for use in service indicated. All pressure gauges shall be liquid filled unless otherwise specified. Provide gauge cocks for all pressure gauges.
2. Type: General use, 1/2 percent accuracy, ANSI B 40.1 grade A, phosphor bronze bourdon type, bottom connection.
3. Case: Aluminum or brass, glass lens, 4 1/2 inch diameter.
4. Connector: Brass with 1/4 inch male NPT. Provide protective syphon when used for steam service.
5. Scale: White coated aluminum, with permanently etched markings.
6. Range: Conform to the following:

   a. Water - 0 - 100 psi.

7. Manufacturer - subject to compliance with requirements, provide pressure gages of one of the following:

   a. Ametek, U.S. Gage Div.
   b. Trerice
   c. Weiss

B. Pressure gage accessories:

1. Gage cocks: Brass cock with 1/4 inch female NPT on each end, and "T" handle brass plug.
2. Syphon: 1/4 inch straight coil constructed of brass tubing with 1/4 inch male NPT on each end.
3. Snubber: 1/4 inch brass bushing with corrosion resistant porous metal disc, through which pressure fluid is filtered. Select disc material for fluid served and pressure rating.
4. Manufacturer: Same as gages.

PART 3 - EXECUTION

3.01 INSTALLATION OF THERMOMETERS

A. General: Install temperature gages in vertical upright position, and tilted so as to be easily read by observer standing on floor.

B. Locations: Install in the following locations and elsewhere as indicated:

1. At inlet and outlet of each hydronic zone 3-way valve.
2. At inlet and outlet of each hydronic boiler and chiller.
3. At inlet and outlet of each hydronic coil in air handling units, and built-up central systems.
4. At inlet and outlet of each hydronic heat exchanger.
5. At inlet and outlet of each hydronic heat recovery unit.
6. At inlet and outlet of each thermal storage tank.
7. At outlet of domestic hot water heater.
8. Common boiler supply and return header.

C. Thermometer wells: Install in piping tee where indicated, in vertical upright position. Fill well with Thermal grease.

3.2 INSTALLATION OF PRESSURE GAGES

A. General: Install pressure gages in piping tee with pressure gage cock, located on pipe at most readable position.

B. Locations: Install in the following locations, and elsewhere as indicated:

1. At suction and discharge of each hydronic pump.
2. At discharge of each pressure reducing valve.
3. At water service outlet.
4. At inlet and outlet of water side for condensers, chillers, and cooling towers.
5. System makeup water line.
6. Accessible hihg point of hydronic piping systems.

C. Pressure gage cocks: Install in piping tee with snubber or syphon if steam.

END OF SECTION

DIVISION 15 – MECHANICAL

SECTION 15182 - STEAM AND CONDENSATE PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes steam and condensate piping and specialties for systems up to 125 psig (860 kPa), inside the building.

B. Related Sections include the following:

1. Division 15 Section "Basic Materials and Methods" for general piping materials and installation requirements.
2. Division 15 Section "Valves" for general-duty gate, globe, ball, butterfly, and check valves.
3. Division 15 Section "Thermometers and Gages" for thermometers, flow meters, and pressure and vacuum gages.
4. Division 15 Section for labeling and identifying steam and condensate piping.
5. Division 15 for pipe supports, product descriptions and installation requirements. Hanger and support spacing specified in this section.
6. Division 15 "Automatic Temperature Controls" for temperature control, valves and sensors.

1.03 DEFINITIONS

A. HP Systems: High-pressure systems operating at 15 psig (104 kPa) or more.

B. LP Systems: Low-pressure systems operating at less than 15 psig (104 kPa).

1.04 SUBMITTALS

A. Product Data: For each type of special-duty valve and steam trap indicated, including rated capacities and accessories.

B. Shop Drawings: Detail flash tank assemblies and fabrication of pipe anchors, hangers, special pipe support assemblies, alignment guides, and expansion joints and loops and their attachment to the building structure. Include dimensions, weights, loadings, required clearances, method of field assembly, components, and location and size of each field connection.

C. Welding Certificates: Copies of certificates for welding procedures and personnel.

D. Field Test Reports: Written reports of tests specified in Part 3 of this Section. Include the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Failed test results and corrective action taken to achieve requirements.

E. Maintenance Data: For steam traps, vacuum breakers, and meters, include in maintenance manuals as specified in Division 1.

1.05 QUALITY ASSURANCE

A. Welding: Qualify processes and operators according to the ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

B. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation. Safety valves and pressure vessels shall bear the appropriate ASME label. Fabricate and stamp flash tanks to comply with the ASME Boiler and Pressure Vessel Code, Section VIII, Division 1.

1.06 COORDINATION

A. Coordinate layout and installation of steam and condensate piping and suspension system components with other construction, including light fixtures, hydronic piping, fire-suppression-system components, and partition assemblies.

B. Coordinate pipe sleeve installation for foundation wall penetrations.

C. Coordinate piping installation with roof curbs, equipment supports, and roof penetrations.

D. Coordinate pipe fitting pressure classes with products specified in related Sections.

E. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3 Sections.

F. Coordinate installation of pipe sleeves for penetrations through exterior walls and floor assemblies. Coordinate with requirements for firestopping specified in Division 15 for fire and smoke wall and floor assemblies.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Safety Valves:

    a. Armstrong International, Inc.
    b. Kunkle Inds. Inc.; Kunkle Valve Division.
    c. Spirax Sarco, Inc.
    d. Watts Industries, Inc.; Watts Regulators.

2. Pressure-Reducing Valves:

    a. Armstrong International, Inc.
    b. ITT Hoffman; ITT Fluid Technology Corp.
    c. Leslie Controls, Inc.
    d. Spence Engineering Company, Inc.
    e. Spirax Sarco, Inc.

3. Steam Traps:

    a. Armstrong International, Inc.
    b. Barnes & Jones, Inc.
    c. Dunham-Bush, Inc.
    d. ITT Hoffman; ITT Fluid Technology Corp.
    e. Spirax Sarco, Inc.
    f. Sterling, Inc.

4. Air Vents and Vacuum Breakers:

    a. Armstrong International, Inc.
    b. Barnes & Jones, Inc.
    c. ITT Hoffman; ITT Fluid Technology Corp.
    d. Johnson Corp. (The).
    e. Spirax Sarco, Inc.

5. Steam Meters:

    a. EMCO Flowmeters.
    b. ISTEC Corp.
    c. Preso Meters Corp.
    d. Spirax Sarco, Inc.

6. Condensate Meters:

    a. Hersey Measurement Company.
    b. ISTEC Corp.

2.02 PIPING MATERIALS

A. General: Refer to Part 3 piping application articles for applications of pipe and fitting materials.

2.03 STEEL PIPE AND FITTINGS

A. Steel Pipe:
1. Steel Pipe, NPS 2 (DN 50) and Smaller: ASTM A 53, Type S (seamless), Grade A, Schedules 40 and 80, black steel, plain ends.
2. Steel Pipe, NPS 2-1/2 through NPS 12 (DN 65 through DN 300): ASTM A 53, Type E (electric-resistance welded), Grade A, Schedules 40 and 80, black steel, plain ends.
3. Steel Pipe, NPS 14 through NPS 18 (DN 350 through DN 450): ASTM A 53, Type E (electric-resistance welded) or Type S (seamless), Grade B, Schedule 30, black steel, plain ends.
4. Steel Pipe, NPS 20 (DN 500): ASTM A 53, Type E (electric-resistance welded) or Type S (seamless), Grade B, Schedule 20, black steel, plain ends.
5. Steel Pipe Nipples: ASTM A 733, made of ASTM A 53, Schedules 40 and 80, black steel; seamless for NPS 2 (DN 50) and smaller and electric-resistance welded for NPS 2-1/2 (DN 65) and larger.

B. Cast-Iron Threaded Fittings: ASME B16.4; Classes 125, 150, and 300.

C. Malleable-Iron Threaded Fittings: ASME B16.3; Classes 150 and 300.

D. Malleable-Iron Unions: ASME B16.39; Classes 150, 250, and 300.

E. Cast-Iron Threaded Flanges and Flanged Fittings: ASME B16.1, Classes 125 and 250; raised ground face, and bolt holes spot faced.

F. Wrought-Steel Fittings: ASTM A 234/A 234M, wall thickness to match adjoining pipe.

G. Wrought-Steel Flanges and Flanged Fittings: ASME B16.5, including bolts, nuts, and gaskets of the following material group, end connections, and facings:

1. Material Group: 1.1.
2. End Connections: Butt welding.
3. Facings: Raised face.
4. Flexible Connectors: Stainless-steel bellows with woven, flexible, bronze, wire-reinforcing protective jacket; 150-psig (1035-kPa) minimum working pressure and 250 deg F (121 deg C) maximum operating temperature. Connectors shall have flanged or threaded-end connections to match equipment connected and shall be capable of 3/4-inch (20-mm) misalignment.

H. Welding Materials: Comply with Section II, Part C, of the ASME Boiler and Pressure Vessel Code for welding materials appropriate for wall thickness and for chemical analysis of pipe being welded.

I. Gasket Material: Thickness, material, and type suitable for fluid to be handled; and design temperatures and pressures.

2.04 VALVES

A. Gate, globe, check, ball, and butterfly valves are specified in Division 15 Section "Valves."

B. Refer to Part 3 "Valve Applications" Article for applications of each valve.

2.05 SAFETY VALVES

A. Size and Capacity: As required for equipment according to the ASME Boiler and Pressure Vessel Code.

B. Brass Safety Valves: Class 250, with threaded inlet and outlet; forged copper-alloy disc; fully enclosed steel spring with adjustable pressure range and positive shutoff; factory set and sealed.

1. Drip-Pan Elbow: Cast iron and having threaded inlet and outlet with threads complying with ASME B1.20.1.

C. Cast-Iron Safety Valves: Class 250; forged copper-alloy disc with bronze nozzle; fully enclosed, cadmium-plated steel spring with adjustable pressure range and positive shutoff; raised-face flanged inlet and threaded outlet connections; factory set and sealed.

1. Drip-Pan Elbow: Cast iron and having threaded inlet and outlet with threads complying with ASME B1.20.1.

D. Stop-Check Valves: Class 250, malleable-iron body and bonnet, cylindrical disc, removable liner and machined seat, brass-alloy stem, outside screw and yoke, polytetrafluoroethylene-impregnated packing with 2-piece packing gland assembly, flanged end connections, and cast-iron handwheel.

2.06 PRESSURE-REDUCING VALVES

A. Size, Capacity, and Pressure Rating: Factory set for inlet and outlet pressures indicated.

1. Valve Characteristics: Pilot-actuated, diaphragm type, with adjustable pressure range and positive shutoff. Valves shall have cast-iron body with threaded connections for valves NPS 2 (DN 50) and smaller and flanged connections for valves NPS 2-1/2 (DN 65) and larger; and

hardened stainless-steel trim, replaceable head and seat, main head stem guide fitted with flushing and pressure-arresting device, cover over pilot diaphragm, and non-asbestos gaskets.

2.07 STEAM TRAPS

A. Thermostatic Traps: Class 125, bronze angle-pattern body with integral union tailpiece and screw-in cap; balanced-pressure, stainless-steel or monel bellow element; and renewable, hardened stainless-steel head and seat.

B. Thermodynamic Traps: Stainless-steel body and screw-in cap; maximum operating pressure of 600 psig (4140 kPa); stainless-steel disc and seat; threaded ends.
   1. Float and Thermostatic Traps: ASTM A 126, cast-iron body and bolted cap; renewable, stainless-steel float mechanism with renewable, hardened stainless-steel head and seat; maximum operating pressure of 125 psig (860 kPa); balanced-pressure, stainless-steel or monel thermostatic bellow element.
   2. Thermostatic air vent capable of withstanding 45 deg F (25 deg C) of superheat and resisting water hammer without sustaining damage.
   3. Inverted Bucket Traps: Cast-iron body and cap, pressure rated for 250 psig (1725 kPa); stainless-steel head and seat; stainless-steel valve retainer, lever, and guide pin assembly; and brass or stainless-steel bucket.
   4. Strainer: Integral stainless-steel inlet strainer within the trap body.
   5. Air Vent: Stainless-steel thermostatic vent.

2.08 THERMOSTATIC AIR VENTS

A. Quick Vents: Cast-iron or brass body, with balanced-pressure, stainless-steel or monel thermostatic bellows and stainless-steel heads and seats.

B. Float Vents: Cast-iron or brass body, seamless brass float, balanced-pressure thermostatic bellows, and replaceable stainless-steel seat, float, and head.

2.09 VACUUM BREAKERS

A. Vacuum Breakers: 150-psig (1035-kPa) steam working pressure, 365 deg F (185 deg C) maximum operating temperature, brass or stainless-steel body, and stainless-steel retainer, spring, and ball; with plain or threaded outlet.

2.10 STRAINERS

A. Y-Pattern Strainers: 250-psig (1725-kPa) working steam pressure; ASTM A 126, Class B cast-iron body; stainless-steel screen, No. 20 mesh for NPS 2 (DN 50) and smaller and manufacturer's recommended perforations for NPS 2-1/2 (DN 65) and larger; tapped blowoff plug. Threaded connections for strainers NPS 2 (DN 50) and smaller and flanged connections for strainers NPS 2-1/2 (DN 65) and larger.

B. Basket Strainers: 250-psig (1725-kPa) working steam pressure; ASTM A 126, Class B cast-iron body; stainless-steel screen; bolted cover; threaded connections for strainers NPS 2 (DN 50) and smaller and flanged connections for strainers NPS 2-1/2 (DN 65) and larger.

2.11 FLASH TANKS

A. Shop or factory fabricated of welded steel according to the ASME Boiler and Pressure Vessel Code, for 150-psig (1035-kPa) rating; and bearing ASME label. Fabricate with tappings for vents, low-pressure steam and condensate outlets, high-pressure condensate inlet, air vent, safety valve, and legs.

2.12 METERS

A. Steam Meters: Pipeline sensor of modified venturi design, of stainless-steel construction, for insertion in pipeline between flanges, plus or minus 1 percent accuracy over full-scale deflection, producing pressure differential proportional to square of flow rate.

B. Steam Meters: Pipeline sensor with stainless-steel wetted parts and flange connections and with a piezoelectric sensor removable and serviceable without shutting down the process.

1. Turndown Ratio: At least 10:1 with plus or minus 1 percent accuracy over full flow range.
2. Microprocessor Enclosure: NEMA 250, Type 4.

C. Steam Meters: Pipeline sensor of spring-loaded, variable-area flowmeter type; density compensated; plus or minus 2 percent accuracy over full-scale deflection. Meters shall have a flow computer to display totalizer flow, flow rate, temperature, pressure, time, and date; alarms for high and low flow rate and temperature; and independent timers to store four peak flow rates and total flow. Computer shall have four, 20-mA output, ETA 232C, serial communication ports.

1. Condensate Meters: Brass body with threaded connections for meters NPS 2 (DN 50) and smaller and flanged connections for meters NPS 2-1/2 (DN 65) and larger; positive displacement turbine; magnetic coupling counter; suitable for temperatures up to 250 deg F (121 deg C) and for 250 psig (1725 kPa) working pressure.

PART 3 - EXECUTION

3.01 LP STEAM PIPING APPLICATIONS

A. Steam Piping, NPS 2 (DN 50) and Smaller: Schedule 40 steel pipe, with threaded joints using Class 125 cast-iron fittings.

B. Steam Piping, NPS 2-1/2 through NPS 12 (DN 65 through DN 300): Schedule 40 steel pipe, with welded joints using Schedule 40 wrought-steel welding fittings and Class 150 wrought-steel flanges.

C. Steam Piping, NPS 14 through NPS 18 (DN 350 through DN 450): Schedule 30 steel pipe, with welded joints using Schedule 30 wrought-steel welding fittings and Class 150 wrought-steel flanges.

D. Steam Piping, NPS 20 (DN 500): Schedule 20 steel pipe, with welded joints using Schedule 20 wrought-steel welding fittings and Class 150 wrought-steel flanges.

E. Condensate Piping, NPS 2 (DN 50) and Smaller: Schedule 80 steel pipe, with threaded joints using Class 125 malleable-iron fittings.

F. Condensate Piping, NPS 2-1/2 through NPS 12 (DN 65 through DN 300): Schedule 80 steel pipe, with welded joints using Schedule 80 wrought-steel welding fittings and Class 150 wrought-steel flanges.

3.02 HP STEAM PIPING APPLICATIONS

A. Steam Piping, NPS 2 (DN 50) and Smaller: Schedule 40 steel pipe, with threaded joints using Class 300 malleable-iron fittings.

B. Steam Piping, NPS 2-1/2 through NPS 12 (DN 65 through DN 300): Schedule 40 steel pipe, with welded joints using Schedule 40 wrought-steel welding fittings and Class 150 wrought-steel flanges.

C. Steam Piping, NPS 14 through NPS 18 (DN 350 through DN 450): Schedule 30 steel pipe, with welded joints using Schedule 30 wrought-steel welding fittings and Class 150 wrought-steel flanges.

D. Steam Piping NPS 20 (DN 500): Schedule 20 steel pipe, with welded joints using Schedule 20 wrought-steel welding fittings and Class 150 wrought-steel flanges.

E. Condensate Piping, NPS 2 (DN 50) and Smaller: Schedule 80 steel pipe, with threaded joints using Class 300 malleable-iron fittings.

F. Condensate Piping, NPS 2-1/2 through NPS 12 (DN 65 through DN 300): Schedule 80 steel pipe, with welded joints using Schedule 80 wrought-steel welding fittings and Class 150 wrought-steel flanges.

3.03 VALVE APPLICATIONS

A. General-Duty Valve Applications: Unless otherwise indicated, use the following valve types:

1. Shutoff Duty: Gate and ball valves.
2. Throttling Duty: Globe and ball valves.

B. Install shutoff-duty valves at each branch connection to supply mains, at inlet connection to each steam trap, and elsewhere as indicated.

3.04 LP STEAM-TRAP APPLICATIONS

A. Thermostatic Traps: Convectors and finned-tube radiation.

B. Float and Thermostatic Traps: Steam main and riser drip legs, laundry equipment, kitchen equipment, heat exchangers, and heating coils.

3.05 HP STEAM-TRAP APPLICATIONS

A. Thermostatic Traps: Convectors and finned-tube radiation.

B. Inverted Bucket Traps: Steam main and riser drip legs, and laundry equipment.

C. Float and Thermostatic Traps: Kitchen equipment, heat exchangers, and heating coils.

D. Thermodynamic Traps: Steam main and riser drip legs, and heat tracer lines.

3.06 PIPING INSTALLATIONS

A. Refer to Division 15 Section "Basic Materials and Methods" for basic piping installation requirements.

B. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.

1. Install drains, consisting of a tee fitting, NPS 3/4 (DN 20) ball valve, and short NPS 3/4 (DN 20) threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.

C. Install steam supply piping at a uniform grade of 0.2 percent downward in direction of steam flow.

D. Install condensate return piping at a uniform grade of 0.4 percent downward in direction of condensate flow.

E. Reduce pipe sizes using eccentric reducer fitting installed with level side down.

1. Unless otherwise indicated, install branch connections to steam mains using 45-degree fittings in main pipe, with the takeoff coming out the top of the main pipe. Use of 90-degree tee fittings is permissible if 45-degree fittings are impractical. If length of branch takeoff is less than 10 feet (3 m), pitch branch line down toward mains at a 0.4 percent grade.

2. Install unions in piping NPS 2 (DN 50) and smaller adjacent to each valve, at final connections of each piece of equipment, and elsewhere as indicated.

3. Install flanges in piping NPS 2-1/2 (DN 65) and larger at final connections of each piece of equipment and elsewhere as indicated.

4. Install strainers on supply side of each control valve, pressure-reducing valve, solenoid valve, traps, and elsewhere as indicated. Install NPS 3/4 (DN 20) nipple and ball valve in blowdown connection of strainers NPS 2 (DN 50) and larger. Match size of strainer blowoff connection for strainers smaller than NPS 2 (DN 50).

5. Anchor piping for proper direction of expansion and contraction.

6. Install drip legs at low points and natural drainage points such as ends of mains, bottoms of risers, and ahead of pressure regulators, control valves, isolation valves, pipe bends, and expansion joints.

7. On straight runs with no natural drainage points, install drip legs at intervals not exceeding 300 feet (90 m) where pipe is pitched down in direction of steam flow and a maximum of 150 feet (45 m) where pipe is pitched up in direction of steam flow.

8. Size drip legs at vertical risers same size as pipe and extend beyond rise. Size drip legs at other locations same diameter as main. In steam mains NPS 6 (DN 150) and larger, dirt leg size can be reduced, but to no less than NPS 4 (DN 100).

9. Install gate valve at drip legs, dirt pockets, and strainer blowdowns to allow removal of dirt and scale.

10. Install steam traps close to drip legs.

F. Pitch condensate piping down toward flash tank. If more than one condensate pipe discharges into flash tank, install a swing check valve in each line. Install thermostatic air vent at top of tank. Install inverted bucket or float and thermostatic trap at low-pressure condensate outlet, sized for three times the condensate load. Install safety valve at tank top. Install pressure gage, gate valve, and swing check valve on low-pressure (flash) steam outlet.

3.07 STEAM-TRAP INSTALLATION

A. Install steam traps in accessible locations as close as possible to connected equipment, but not more than 48 inches (1200 mm) from connected equipment.

B. Unless otherwise indicated, install gate valve, strainer, and union upstream from trap; install union, check valve, and gate valve downstream from trap.

3.08 PRESSURE-REDUCING VALVE INSTALLATION

A. Install pressure-reducing valves in readily accessible location for maintenance and inspection.

B. Install bypass piping around each pressure-reducing valve, with globe valve equal in size to area of pressure-reducing valve seat ring, unless otherwise indicated.

C. Install gate valves around each pressure-reducing valve.

D. Install unions around each pressure-reducing valve having threaded-end connections.

E. Install pressure gages on low-pressure side of each pressure-reducing valve and ahead of shutoff valve. Install pressure gages downstream from globe valve on pressure-reducing valve bypass.

1. On two-stage pressure-reducing stations, install drip trap and pressure gage upstream from second stage pressure-reducing valve.

F. Install strainers upstream for each pressure-reducing valve.

G. Install safety valves downstream from each pressure-reducing valve station.

3.09 STEAM METER INSTALLATION

A. Install lengths of straight pipe upstream and downstream from meters according to steam meter manufacturer's instructions.

3.10 SAFETY VALVE INSTALLATIONS

A. Install safety valves according to ASME B31.1. Pipe safety valve discharge without valves to atmosphere outside building. Install drip-pan elbow fitting adjacent to safety valve and pipe drain connection to nearest floor drain.

3.11 HANGERS AND SUPPORTS

A. Hanger, support, and anchor devices are specified in Division 15.

B. Install the following pipe attachments:
   1. Adjustable steel clevis hangers for individual horizontal piping less than 20 feet (6 m) long.
   2. Adjustable roller hangers and spring hangers for individual horizontal piping 20 feet (6 m) or longer.
   3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet (6 m) or longer, supported on a trapeze.
   4. Spring hangers to support vertical runs.

C. Install hangers with the following maximum spacing and minimum rod sizes:
   1. NPS 3/4 (DN 20): Maximum span, 9 feet (2.7 m); minimum rod size, 1/4 inch (6.4 mm).
   2. NPS 1 (DN 25): Maximum span, 9 feet (2.7 m); minimum rod size, 1/4 inch (6.4 mm).
   3. NPS 1-1/2 (DN 40): Maximum span, 12 feet (3.7 m); minimum rod size, 3/8 inch (10 mm).
   4. NPS 2 (DN 50): Maximum span, 12 feet (4 m); minimum rod size, 3/8 inch (10 mm).
   5. NPS 2-1/2 (DN 65): Maximum span, 12 feet (4.3 m); minimum rod size, 3/8 inch (10 mm).
   6. NPS 3 (DN 80): Maximum span, 12 feet (4.6 m); minimum rod size, 3/8 inch (10 mm).
   7. NPS 4 (DN 100): Maximum span, 12 feet (5.2 m); minimum rod size, 1/2 inch (13 mm).
   8. NPS 6 (DN 150): Maximum span, 12 feet (6.4 m); minimum rod size, 1/2 inch (13 mm).
   9. NPS 8 (DN 200): Maximum span, 12 feet (7.3 m); minimum rod size, 5/8 inch (16 mm).
   10. NPS 10 (DN 250): Maximum span, 12 feet (8 m); minimum rod size, 3/4 inch (19 mm).

11. NPS 12 (DN 300): Maximum span, 12 feet (9.1 m); minimum rod size, 7/8 inch (22 mm).

12. NPS 14 (DN 350): Maximum span, 12 feet (9.8 m); minimum rod size, 1 inch (25 mm)

13. NPS 16 (DN 400): Maximum span, 12 feet (10.7 m); minimum rod size, 1 inch (25 mm).

14. NPS 18 (DN 450): Maximum span, 12 feet (11.3 m); minimum rod size, 1-1/4 inches (32 mm).

15. NPS 20 (DN 500): Maximum span, 12 feet (11.9 m); minimum rod size, 1-1/4 inches (32 mm).

D. Support vertical runs at roof, at each floor, and at 10-foot (3-m) intervals between floors.

3.12 PIPE JOINT CONSTRUCTION

A. Refer to Division 15 Section "Basic Materials and Methods" for joint construction requirements for threaded, welded, and flanged joints.

3.13 TERMINAL EQUIPMENT CONNECTIONS

A. Size for supply and return piping connections shall be same as for equipment connections.

B. Install traps and control valves in accessible locations close to connected equipment.

C. Install bypass piping with globe valve around control valve. If multiple, parallel control valves are installed, only one bypass is required.

D. Install vacuum breaker downstream from control valve and bypass and close to coil inlet connection.

E. Install ports for pressure and temperature gages at coil inlet connections.

F. Install a drip leg at coil outlet.

3.14 FIELD QUALITY CONTROL

A. Prepare steam and condensate piping according to ASME B31.9 and as follows:

1. Leave joints, including welds, uninsulated and exposed for examination during test.
2. Flush system with clean water. Clean strainers.

3. Isolate equipment from piping. If a valve is used to isolate equipment, its closure shall be capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
4. Install safety valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.

B. Perform the following tests on steam and condensate piping:

1. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
2. While filling system, use vents installed at high points of system to release trapped air. Use drip legs installed at low points for complete draining of liquid.
3. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the design pressure. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed either 90 percent of specified minimum yield strength or 1.7 times "SE" value in Appendix A of ASME B31.9, "Building Services Piping."
4. After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
5. Prepare written report of testing.

3.15 ADJUSTING

A. Mark calibrated nameplates of pump discharge valves after steam and condensate system balancing has been completed, to permanently indicate final balanced position.

B. Perform these adjustments before operating the system:

1. Open valves to fully open position. Close coil bypass valves.
2. Set temperature controls so all coils are calling for full flow.
3. Check operation of automatic bypass valves.

3.16 CLEANING

A. Flush steam and condensate piping with clean water. Remove and clean or replace strainer screens.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15510 – HOT WATER PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of hot water piping systems work is indicated on drawings and schedules, and by requirements of this section.

B. Applications for hot water piping systems include the following:

1. Hot water piping systems for terminal units.

C. Refer to appropriate Division 15 sections for insulation required in connection with hot water piping systems.

1.03 QUALITY ASSURANCE

A. ANSI Compliance: Comply with applicable American National Standards pertaining to products and installation of hot water piping systems.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's data for hot water piping systems, materials and products.

B. Shop Drawings: Submit scaled layout drawings of installed hot water pipe and fittings including, but not necessarily limited to, pipe sizes, locations, elevations and slopes of horizontal runs, wall and floor penetrations, and connections. Show interface and spatial relationship between piping and proximate equipment.

PART 2 - PRODUCTS

2.01 HOT WATER PIPING MATERIALS AND PRODUCTS

A. General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements.

B. Provide materials and products complying with ANSI B31.1 Code for Power Piping where applicable, base pressure rating on hot water piping systems maximum design pressures. Provide sizes and types matching piping and equipment materials used in hot water piping systems. Where more than one type of material or product is indicated, selection is Installer's option.

2.02 BASIC IDENTIFICATION

A. General: Provide identification complying with Division 15 Basic Materials and Methods section "Mechanical Identification."

2.03 BASIC PIPE AND PIPE FITTINGS

A. General: Provide pipe, tube and fittings complying with Division 15 Basic Materials and Methods section "Pipe and Pipe Fittings," in accordance with the following listing:

1. Hot water piping:

a. Pipe size 3" and smaller: Copper.

1) Pipe weight: Type L copper, hard temper.
2) Fittings: Wrought copper solder ends. 50/50 solder.

b. Pipe size over 3": Black steel pipe.

1) Pipe weight: Schedule 40.
2) Fittings: Wrought steel butt-weld and 150 lb. Weld neck flanges.

2.04 BASIC PIPING SPECIALTIES

A. General: Provide piping specialties complying with Division 15 Basic Materials and Methods section "Piping Specialties."

2.05 BASIC SUPPORTS, ANCHORS AND SEALS

A. General: Provide supports, anchors and seals complying with Division 15 Basic Material and Methods section "Supports, Anchors, and Seals."

2.06 BASIC VALVES

A. General: Provide valves complying with Division 15 "Valves" section in accordance with the following listings:

1. Sectional Valves:

a. 2" and smaller: Ball valves.
b. 2 1/2: and larger: Gate valves.

2. Shutoff Valves:

a. 2" and smaller: Ball valves.
b. 2 1/2" and larger: Gate valves.

3. Heating Terminal Outlet Valves:

a. 2" and smaller: Balance valve.
b. 2 1/2" and larger: Gate valves.

4. Drain Valves:

a. 2" and smaller: Ball valves.

5. Check Valves:

a. All sizes: Silent wafer type check valve.

2.07 BASIC EXPANSION COMPENSATION

A. General: Provide expansion compensation products complying with Division 15 "Expansion Compensation" section in accordance with the following listing:

1. Flexible ball pipe joints.
2. Pipe alignment guides and anchors.

2.08 BASIC THERMOMETERS AND GAUGES

A. General: Provide meters and gauges complying with Division 15 "Thermometers and Gauges" section in accordance with the following listing:

1. Temperature gauges and fittings.
2. Pressure gauges and fittings.
3. Flow measuring gauges.

2.09 HYDRONIC SPECIALTIES

A. General: Provide hydronic specialties complying with Division 15 section "Hydronic Specialties," in accordance with the following listing:

1. Balance valves.
2. Balance cocks.
3. Vent valves.

PART 3 - EXECUTION

3.01 INSTALLATION OF BASIC IDENTIFICATION

A. General: Install mechanical identification in accordance with Division 15 Basic Materials and Methods section "Mechanical Identification."

3.02 INSTALLATION OF HOT WATER DISTRIBUTION PIPING

A. General: Install water distribution piping in accordance with Division 15 Basic Materials and Methods section "Pipe, Tube and Fittings."

B. Install eccentric reducers where pipe is reduced in size in direction of flow, with tops of both pipes and reducer flush.

C. Install piping with 1" minimum rise in 40' pipe run (0.2%) in direction of flow.

D. Install piping level with no pitch.

E. Connect branch feed piping to mains at horizontal center line of mains, connect run-out piping to branches at horizontal center line of branches.

F. Locate groups of pipes parallel to each other, spaced to permit applying full insulation and servicing of valves.

3.03 INSTALLATION OF PIPING SPECIALTIES

A. Install piping specialties in accordance with Division 15 Basic Materials and Methods section "Piping Specialties."

3.04 INSTALLATION OF SUPPORTS, ANCHORS AND SEALS

A. Install supports, anchors and seals in accordance with Division 15 Basic Materials and Methods section "Supports, Anchors and Seals".

3.05 INSTALLATION OF VALVES

A. Install valves in accordance with Division 15 "Valves" section.

B. Sectional valves: Install on each branch and riser, close to main, where branch or riser serves two or more heating terminals or equipment connections and elsewhere as indicated.

C. Shutoff valves: Install on inlet and outlet of each mechanical equipment item and on inlet of each heating terminal and elsewhere as indicated.

D. Heating terminal outlet valves: Install on outlet of each heating terminal and elsewhere as indicated.

E. Drain valves: Install on each mechanical equipment item located to completely drain equipment for service or repair. Install at base of each riser, at base of each rise or drop in piping system and elsewhere where indicated or required to completely drain hot/chilled water piping system.

F. Check valves: Install on discharge side of each pump and elsewhere as indicated.

3.06 INSTALLATION OF EXPANSION COMPENSATION PRODUCTS

A. Install expansion compensation products in accordance with Division 15 "Expansion Compensation" section.

3.07 INSTALLATION OF THERMOMETERS AND GAUGES

A. Install thermometers and gauges in accordance with Division 15 "Thermometers and Gauges" section.

3.08 INSTALLATION OF HYDRONIC SPECIALTIES

A. General: Install hydronic specialties in accordance with Division 15 "Hydronic Specialties" section.

3.09 EQUIPMENT CONNECTIONS

A. General: Connect hot water piping system to mechanical equipment as indicated and comply with equipment manufacturer's instructions where not otherwise indicated. Install shutoff valve and union on supply and return, drain valve on drain connection.

B. Hot water terminals: Install hot water terminals with heating terminal outlet valve and union on outlet, union, shutoff valve on inlet. Install automatic air vent valve on element in accordance with manufacturer's instructions. Locate valves and balancing cocks behind valve access doors for ease of maintenance. Where indicated, install automatic temperature control valve with unions between ball valve and element on supply line.

3.10 CLEANING, FLUSHING AND INSPECTING

A. General: Include coils, etc. See Division 15 Basic Materials and Methods section "Pipe Tube and Fittings".

3.11 TESTING AND BALANCING

A. General: See Division 15 "Testing, Adjusting and Balancing” section.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15530 - REFRIGERATION PIPING SYSTEM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specifications sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of refrigeration piping systems work is indicated on drawings and schedules, and by requirements of this section.

B. Applications for refrigeration piping systems include the following:

1. Refrigerant suction line piping between compressors and cooling coils.
2. Refrigerant liquid line piping between liquid receivers and cooling coils.
3. Refrigerant discharge line piping between compressors and condensers.
4. Refrigerant condenser drain line piping between condensers and liquid receivers.

C. Insulation for refrigeration piping is specified in applicable Division 15 sections, and is included as work of this section.

D. Refer to appropriate Division 15 sections for insulation required in connection with refrigeration piping, not work of this section.

1.03 QUALITY ASSURANCE

A. Materials and equipment shall be provided by one of the manufacturers listed in Part 2 - Products. Materials and equipment from other manufacturers may be accepted if proven equal to those specified. This contractor is liable for and shall pay for all architectural and engineering review and redesign costs for substitute materials and equipment. This contractor also is liable for all costs of changes in the work required by substitute equipment.

B. The length of time the manufacturer has been in business, the location and capability of complete repair facilities, availability of repair parts and annual maintenance contracts all will be considered in determining equality.

C. Refer to General Conditions Section GC31, "Submissions",for requirements pertaining to substitute materials and equipment.

D. Installer - a firm with at least 3 years of successful installation experience on projects with refrigeration piping system work similar to that required for project.

E. ANSI code compliance - comply with applicable provisions of ANSI B31.5, "Refrigeration Piping" and extend applicable lower pressure limits to pressures below 15 psig.

F. Safety code compliance - comply with applicable portions of ANSI/ASHRAE 15, "Safety Code for Mechanical Refrigeration".

G. Brazing - comply with applicable requirements of ANSI B31.5, "Refrigeration Piping", pertaining to brazing of refrigeration piping for shop and project site locations.

1.04 SUBMITTALS

A. Product data - submit manufacturer's data for refrigeration piping systems materials and products.

B. Brazing certification - certify brazing procedures, brazers and operators in accordance with ASME standards (ANSI B31.5).

C. Shop drawings - submit scaled layout drawings of installed refrigeration pipe and fittings including, but not necessarily limited to, pipe sizes, locations, elevations and slopes of horizontal runs, wall and floor penetrations, and connections. Show interface and spatial relationship between piping and proximate equipment.

PART 2 - PRODUCTS

2.01 REFRIGERATION PIPING MATERIALS AND PRODUCTS

A. General - provide piping materials and factory fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by engineer and manufacturer of equipment to comply with installation requirements. Provide materials and products complying with ANSI B31.5 Code for Refrigeration Piping where applicable, base pressure rating of refrigeration piping system maximum design pressures. Provide sizes and types matching piping and equipment connections, provide fittings of materials which match pipe materials used in refrigeration piping systems. Where more than one type of materials or products are indicated, selection is engineers' option.

2.02 BASIC IDENTIFICATION

A. General - provide identification complying with Division 15 Basic Materials and Methods section in accordance with the following listing:

1. Refrigeration piping - plastic pipe markers.

2.03 BASIC PIPE, TUBE AND FITTINGS

A. General - provide pipe, tube and fittings complying with Division 15 Basic Materials and Methods section "Pipe, Tube and Fittings", in accordance with the following listing:

1. Pipe size 2" and smaller - black steel pipe.

   a. Pipe weight - Schedule 40.
   b. Pipe weight - Schedule 80.
   c. Fittings - forged steel, socket welding.
   d. Fittings - wrought steel, buttwelding.

2. Pipe size 2 1/2" and larger - black steel pipe.

   a. Pipe weight - Schedule 40
   b. Pipe weight - Schedule 80.
   c. Fittings - wrought steel, buttwelding.

3. Tube size 3" and smaller - copper tube.

   a. Wall thickness - Type K, hard drawn temper.
   b. Wall thickness - Type L, hard drawn temper.
   c. Fittings - wrought copper, solder joints.
   d. Joints - soldered, silver lead solder, ANSI/ASTM B 32, Grade 96 TS.
   e. Joints - brazed, American Welding Society (AWS) classification BCuP-4 for brazing filler metal.

4. Tube size 4 1/8" and smaller - copper tube.

   a. Wall thickness - type ACR, hard drawn temper.
   b. Fittings - wrought copper, solder joints.
   c. Joints - soldered, silver lead solder, ANSI/ASTM B 32, Grade 96 TS.
   d. Joints - brazed, American Welding Society (AWS) classification BCuP-4 for brazing filler metal.

5. Tube size 3/4" and smaller - copper tube.

   a. Wall thickness - type ACR, soft annealed temper.
   b. Fittings - cast copper alloy for flared copper tubes.
   c. Joints - flared.

6. Tube size 7/8" through 4 1/8" - copper tube.

   a. Wall thickness - type ACR, soft annealed temper.
   b. Fittings - wrought copper, solder joints.
   c. Joints - soldered, silver solder, ANSI/ASTM B 32, Grade 96 TS.
   d. Joints - brazed, American Welding Society (AWS) classification BCuP-4 for brazing filler metal.

2.04 BASIC PIPING SPECIALTIES

A. General - provide piping specialties complying with Division 15 Basic Materials and Methods section "Piping Specialties", in accordance with the following listing:

1. Pipe escutcheons.
2. Pipe sleeves.

2.05 BASIC SUPPORTS, ANCHORS AND SEALS

A. General - provide supports, anchors and seals complying with Division 15 Basic Materials and Methods section "Supports, Anchors and Seals", in accordance with the following listing:

1. Adjustable steel clevises, adjustable roller hangers, and adjustable pipe roll stands for horizontal piping hangers and supports.
2. Two bolt riser clamps for vertical piping supports.
3. Concrete inserts, C-clamps, and steel brackets for building attachments.
4. Protection shields for insulated piping support in hangers.
5. Copper flashings for piping penetrations.

2.06 SPECIAL REFRIGERATION VALVES

A. General - special valves required for refrigeration piping systems include the following types:

1. Globe and check valves:

a. Globe shutoff valves - forged brass, packed, back seating, winged seal cap, 300 degrees F (149 C) temperature rating, 500 psi working pressure.

b. Check valves - forged brass, accessible internal parts, soft synthetic seat, fully guided brass piston and stainless steel spring, 250 degrees F (121 C) temperature rating, 500 psi working pressure.

c. Available manufacturers - subject to compliance with requirements, manufacturers offering globe and check valves which may be incorporated in the work include, but are not limited to, the following:

d. Manufacturer - one of the following:

1) Henry Valve Co.
2) Parker Hannifin Corp, Refrigeration & Air Conditioning Div.
3) Sporlan Valve Co.

2. Solenoid valves:

a. 2-way solenoid valves - forged brass, designed to conform to ARI 760, normally closed, teflon valve seat, NEMA 1 solenoid enclosure, 24 volt, 60 Hz., UL listed, 1/2" conduit adapter, 250 degrees F (121 C) temperature rating, 400 psi working pressure.

1) Manual operator - provide manual operator to open valve.

b. Available manufacturers - subject to compliance with requirements, manufacturers offering solenoid valves which may be incorporated in the work include, but are not limited to, the following:

c. Manufacturer - one of the following:

1) Alco Controls Div. Emerson Electric Co.
2) Automatic Switch Co.
3) Sporland Valve Co.

2.07 REFRIGERATION ACCESSORIES

A. Refrigerant strainers - brass shell and end connections, brazed joints, monel screen, 100 mesh, UL listed, 350 psi working pressure.

B. Moisture liquid indicators - forged brass, single port, removable cap, polished optical glass, solder connections, UL listed, 200 degrees F (93 C) temperature rating, 500 psi working pressure.

C. Refrigerant filter driers - steel shell, ceramic fired desiccant core, solder connections, UL listed, 500 psi working pressure.

D. Refrigerant filter driers - corrosion resistant steel shell, steel flange ring and spring, wrought copper fittings, ductile iron cover plate with steel cap screws, replaceable filter drier core, 500 psi working pressure.

E. Evaporator pressure regulators - provide corrosion resistant, spring loaded, stainless steel springs, pressure operated, evaporator pressure regulator, in size and working pressure indicated, with copper connections.

F. Refrigerant discharge line mufflers - provide discharge line mufflers as recommended by equipment manufacturer for use in service indicated, UL listed.

G. Available manufacturers - subject to compliance with requirements, manufacturers offering refrigeration accessories which may be incorporated in the work include, but are not limited to, the following:

H. Manufacturer - one of the following:

1. Alco Controls Div. Emerson Electric Co.
2. Henry Valve Co.
3. Sporlan Valve Co.

PART 3 - EXECUTION

3.01 INSTALLATION OF BASIC IDENTIFICATION

A. General -install mechanical identification in accordance with Division 15 Basic Materials and Methods section "Mechanical Identification"

3.02 INSTALLATION OF REFRIGERATION PIPING

A. General - install refrigeration piping in accordance with Division 15 Basic Materials and Methods section "Pipe, Tube and Fittings", and in compliance with equipment manufacturer's recommendations.

3.03 INSTALLATION OF PIPING SPECIALTIES

A. Install piping specialties in accordance with requirements of Division 15 Basic Materials and Methods section "Piping Specialties".

3.04 INSTALLATION OF SUPPORTS, ANCHORS AND SEALS

A. Install supports, anchors, and seals in accordance with requirements of Division 15 Basic Materials and Methods section "Supports, Anchors and Seals".

3.05 INSTALLATION OF SPECIAL REFRIGERATION VALVES

A. General - install refrigeration valves where indicated, and in accordance with manufacturer's instructions. Remove accessible internal parts before soldering or brazing, replace after joints are completed.

1. Solenoid valves - install in refrigerant piping as indicated with stem pointing upwards.

    a. Wiring of solenoid valves is specified in applicable Division 16 sections and is included as work of this section.
    b. Wiring of solenoid valves is specified in applicable Division 16 sections, not work of this section.

3.06 INSTALLATION OF REFRIGERATION ACCESSORIES

A. Refrigerant strainers - install in refrigerant lines as indicated and in accessible location for service.

B. Moisture liquid indicators - install as indicated on refrigerant liquid lines, in accessible location.

C. Refrigerant filter dryers - install in refrigerant lines as indicated, and in accessible location for service.

D. Evaporator pressure regulators - install in refrigerant suction lines or evaporator outlets as indicated. Adjust, if required, for proper evaporator pressure.

E. Refrigerant discharge line mufflers - install as indicated, in horizontal or downflow portion of hot-gas lines, immediately after leaving compressor, not in riser.

3.07 EQUIPMENT CONNECTIONS

A. General - connect refrigerant piping to mechanical equipment in manner shown, and comply with equipment manufacturer's instructions where not otherwise indicated.

3.08 FIELD QUALITY CONTROL

A. Refrigerant piping leak test - prior to initial operation, clean and test refrigerant piping in accordance with ANSI B31.5, "Refrigeration Piping". Perform initial test with dry nitrogen, using soap solution to test all joints. Perform final test with 27" vacuum and then 200 psi using halide torch. System must be entirely leak free.

B. Repair or replace refrigerant piping as required to eliminate leaks and retest as specified to demonstrate compliance.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15650 - HEATING, VENTILATING, AND AIR CONDITIONING

1.01 GENERAL

A. The following specifications are intended to supplement the applicable drawings. The drawings and specifications provide for a complete detailed installation. The Contractor shall also prepare final drawings for duct work, piping, controls, etc. These drawings must be submitted for approval and then be included as a supplement to the Instruction Manuals. The work, as defined, is generally in compliance with all code requirements. The Contractor shall be required to coordinate the final installation with the local codes governing the installation and other trades under this contract.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15656 - TEMPERATURE CONTROL SYSTEMS

1.01 GENERAL

A. It is the intent of this specification to overhaul, refurbish or replace, and modernize the existing automatic temperature control systems at buildings listed to effect more efficient operation and energy conservation savings. Replacements shall be by the same manufacturer as existing equipment unless otherwise specified.

B. The system shall be complete in all respects including labor, materials, equipment, and services necessary and shall be installed by personnel regularly employed by a control manufacturer.

C. All new pneumatic tubing shall be plastic tubing and shall be concealed. If not concealed, tubing shall be copper and, if subject to vandalism, shall be hard shell copper.

D. The existing system shall consist of any device, tubing, etc. supplied or installed by the original temperature control manufacturer and any additions or modifications made to that system up until the present time. The Contractor accepts responsibility for all equipment, etc., regardless of the installer. The Contractor shall locate and identify all pneumatic, electric and pneumatic electric control devices associated with the building, and, if a control manufacturer would normally indicate this type of device on their schematic as supplying or installing this device, it shall be considered as part of this contract. Therefore, items such as boiler controls, mechanical devices such as pumps, motors, etc., are excluded.

E. Vandalized or missing controls at the time of bid become the Contractor's responsibility. Vandalism occurring after the time of contract award must be demonstrated to the Engineer as such if the Contractor anticipates additional compensation.

1.02 MATERIALS AND METHODS

A. Work shall include, but not be limited to, the following:

1. System Purge: Using a minimum of 20 gallons of an exceptionally pure Halo carbon refrigerant, purge the existing system by inserting a tank between the compressor discharge and the pressure reducing valve and introduce refrigerant by the bubbling method. All end of line automatic temperature control valves and a minimum of 10 valves between the compressor and the end of the line valves shall be cracked to allow oil to escape from the system.

a. Caution shall be taken not to allow excessive air leakage which will cause the compressors to run continuously during the cleaning operation. The Contractor shall leave thermostats and controllers in the air distribution system while the cleaning solvent

is being introduced.

b. At least 16 thermostat locations (4 end of line locations, 8 in close proximity to the compressor, and 4 at intermediate locations on DIFFERENT zones) shall be checked prior to and after the application to verify satisfactory results.

c. Should oil be present in the air system after the first application of the cleaning solvent, the procedure shall be repeated until oil is no longer present.

d. In order to prevent diaphragm or seal failure, at no time during the purging of air lines shall the systems air pressure be allowed to exceed maximum operating pressures of any one control unit.

2. Oil Filters: Provide one pre-filter before air dryer and one final filter after air dryer, each piped in with a bypass line with valve to allow filter replacement. Filters shall have replaceable cartridges. If filters are existing, cartridges shall be replaced.

3. Valves: If a valve is passing steam or hot water in the closed position, the disc must be replaced at a minimum and the valve seat resurfaced, if necessary. All leaking valve packings must be repacked. All moving parts shall operate as per original design; if not, the Contractor shall replace the valve with new.

4. Piping: The pneumatic system must be checked for leaks and demonstrated as tight.

5. Dampers: All dampers are to be lubricated and adjusted for smooth operation and tight close off. Damaged or missing linkages are to be repaired or replaced. Service, repair, or replace damper motors to ensure proper operation.

6. Outside Temperature Controllers: Repair or replace as required all outside temperature controllers.

7. Classroom Control Retrofit:

a. Repair or replace each airstream thermostat, damper motor, and miscellaneous components in the unit vents.

b. Calibrate, adjust, and balance each unit ventilator for day and night cycles of operation.

c. Free lubricate and adjust all automatic dampers for smooth positioning and tight closure. Service, repair, or replace damper motors and adjust linkages for proper operation.

d. Check, service, repair, or replace and adjust all miscellaneous control devices (i.e. pressure switches, solenoids, relays, manual switches, program clocks,

etc.).

e. Furnish and install unbreakable injection molded opaque guards with tamper proof screws and heavy metal mounting brackets. Guards to be installed over all thermostats.

f. Sequence of Operation:

1. Unit Ventilator: When the room temperature is at the high end of its throttling range (approximately 75°F), the outdoor air damper is wide open, subject to the mixed air controller and the unit is on full cooling cycle. As the room temperature decreases, the damper throttles closed with no minimum setting. Provide a "float zone" of approximately 3-5°F between the close of the cooling cycle and the start of the heating cycle to allow internal heat gains to maintain conditions above the thermostat set point whenever possible. After a further decrease in room temperature, the valve shall begin to open and is fully open at the low end of the throttling range (approximately 68°F). On an increase in room temperature, the reverse of the above shall take place. Whenever the outdoor air temperature is below 35°F, the outdoor air damper shall be in the closed position.

2. Air Handlers: Existing set point control shall be converted to space "demand" control of both the "heating" and "cooling" functions. Provide sequencing valve and dampers so that al call for heating with be accomplished using recirculated air only. When the system is on its cooling cycle, temperatures shall be controlled by mixing outdoor and return air to eliminate reheating same. Whenever the outdoor air temperature is below 35°F, the outdoor air damper shall be in the closed position, except on 100 percent outdoor air systems.

8. General:

a. All controls must be checked for sequence of operation during the heating season as well as cooling season. Unit vents, H & V units, AC units, fan coils, unit heaters, cabinet heaters, central panel controls, day/night system, exhaust fans, etc., must all be seen in actual operation and perform according to the original sequence of operation. Replace all fan coil air vents, clean coils/drain pans and unit interiors, replace belts and lubricate bearings and valves, install new air filters, etc. for a complete and operating system.

b. A signed sticker applied at the control device is required inside every control cabinet, unit vent, etc. The burden of proof that the control was looked at and proven functional is the Contractor's responsibility. Failure to apply stickers may be cause for redoing that system.

c. It should be noted that the Contractor will be required to demonstrate entire system functioning when the project is complete. If a pattern develops of problems with the controls at the time of inspection, the Contractor is open to the liability of redoing entire sections of the building. Again, the intent is to demonstrate a complete and functional system and to repair or replace as necessary to accomplish that end.

1.03 QUALIFICATIONS OF BIDDERS

A. The Contractor shall have at least ten (10) years experience in servicing and maintaining temperature control systems and must be able to furnish the Owner/Engineer at least 10 projects of a similar nature successfully completed within the past 5 years. The Contractor shall also have an on-hand inventory of at least $100,000 of temperature controls.

B. Installation by wholesalers, contractors, or franchise dealers, or any such firm whose principle business is not that of manufacturing and installing temperature control systems is not acceptable.

1.04 GUARANTEE

A. The Contractor shall guarantee all workmanship and materials to be free from defects for a period of one (1) year from date of acceptance, and, if proven defective, it will be replaced or repaired free of charge. All work shall ensure a complete and efficient system upon completion.

1.05 BIDDERS TO EXAMINE SITE

A. Bidders shall be held to have accepted terms and conditions of all contract documents, to have examined the building and site and all conditions that may affect the work as well as all parts of specifications, and fully inform themselves of existing conditions. No claim for relief of mistakes in bid will be entertained; each bidder shall be held strictly to his bid.

1.06 SUPERVISION AND SAFETY PRECAUTIONS

A. The Contractor shall, at all times, provide adequate and proper supervision of the work and supply the safety precautions as set forth by the Department of Labor. The Contractor shall have sole responsibility in the enforcement of all Federal Safety Precautions and laws.

1.07 SCOPE OF OPERATION

A. The following new equipment and controls shall be added to the automatic temperature control system.

1. Install refrigerated air driers, Arrow, Hankinson, or equal. Install new pre and final oil filters.

2. Contractor shall provide and install new Paragon EC 404 optimal start programmer with Xencon XTS-4 or equal electronic time switch in lieu of existing mechanical time clocks all tied into existing building heating controls, to provide automatic start-up of heating system. These devices are to be installed to allow maximum day/night switching capability and are to be integrated with the day/night auto switches. At the completion of the panel rehab, all parts of the day/night switching system will be demonstrated as 100 percent operational. The Contractor shall demonstrate how each zone runs in day cycle, night cycle, and how the night cycle restores if the zone falls below night setback temperature. All building air moving equipment will be off on night cycle unless maintaining night setback.

3. Contractor shall be responsible for all power wiring as well as control wiring, etc., for all new equipment such as compressors, driers, digital optimizer, electronic time clock, etc.

4. Work described above should be performed, where applicable, and each Contractor shall provide a complete pre-bid survey to substantiate replacements and repairs.

5. No new equipment will be supplied or installed without submittal of schematics showing complete piping and wiring as well as all pertinent technical data. All controls used other than original manufacturer must be submitted to Engineer for approval.

7. Pneumatic Compressors: Compressors shall be Quincy or equal with tank mounted single stage air compressors complete with belt guard after cooler, electric alternation, a pre and final oil filter assembly, automatic tank drain, and all necessary gauges, etc., as required for a complete and operating system. Tank mounted compressors shall be equal in size to existing compressors. New units shall be equipped with pressure gauges, safety valve, tank drain, shut off valve, and all magnetic motor starters. Tank shall conform to ASME National Board specification. An intake filter silencer, service valve, and Vee belt drivers shall be provided. The motor and pressure switches shall be to NEMA standards. Unit shall be tied into all existing lines, etc., as required. New compressors shall be sized for a one third run time. Compressor shall also be supplied with vibration pads, disconnects, wiring and piping. Unit shall be run through a factory-break-in period and tested for low oil carryover, air delivery, leakage, and power consumption. Proof of this break in/test period shall be provided with the delivery of the new unit.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15657 - ELECTRICAL WORK

1.01 GENERAL

A. The Contractor shall furnish all labor and material required for the installation of the systems. A brief description of the work is as follows.

a. Furnish all electrical feeders, circuit, and control wiring for the new burner and boiler controls utilizing existing boiler/burner feeds where possible.

b. Furnish all electrical connections for new oil fired separate domestic water heater inclusive of aquastats and circulator operation for recirculation lines.

c. All cutting, patching, and painting as required.

d. All controls for burners as specified inclusive of disconnect switches.

e. Testing of all wiring as directed.

B. Drawings:

1. The Contractor shall submit six (6) copies of each new item, bill of material, drawings, and wiring diagrams for approval prior to the installation of the equipment. These shall be certified factory drawings prepared by the manufacturer specifically for this project. Stock drawings or field drawings pertinent to other projects will not be acceptable.

ALL ELECTRICAL WORK SHALL MEET THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15802 - INSPECTION TESTING, AND BALANCING

1.01 GENERAL

A. All tests shall be conducted in the presence of a representative of the Owner and/or the Architect, by a qualified vendor specializing in balancing of air systems.

B. The H.V.A.C. systems shall be adjusted, balanced, and set so as to provide the temperature and air volumes required and as shown on the drawings.

C. The Contractor shall demonstrate that all air distribution systems and apparatus fulfill the requirements of the specifications and shall operate the equipment for a sufficient time to properly adjust the controls and conscientiously instruct the Owner's representatives in the care and operation of the systems.

D. The Contractor shall obtain and pay for all required inspections and permits required by State Ordinances and by the NBFU and provide all required testing equipment. All equipment shall be properly calibrated.

E. The Contractor shall refer to ASHRAE handbook, "Testing, Adjusting, and Balancing" A.A.B.C. and N.E.B.B. required testing procedures.

F. Balance all systems to design ratings, record pressure drop readings across all major systems, and make flow and pressure measurements.

G. Record all measurements, complete all flow diagrams, and submit complete to the Architect.

1.02 SCOPE

A. This section outlines the recommended test and inspection procedures to be followed in the inspection of any H.V.A.C. plant prior to acceptance and subsequent operation. In addition, the areas of responsibility are defined such that all tests and inspections are conducted in a manner to assure that the system meets the requirements of all applicable codes.

1.03 PRELIMINARY PROCEDURES

A. It shall be the responsibility of the Contractor to complete the following work prior to conducting and tests:

1. Installation of the system(s) and all applicable controls and accessories as outlined in the specifications and/or drawings.

2. Ensure all wiring is permanently affixed. Temporary wiring and/or connections will not be permitted during testing.

B. It shall be the responsibility of the Contractor, under the direction of the Architect, to perform electrical continuity tests only to ascertain that the field wiring is correct from the H.V.A.C. equipment control panel terminal strip to the H.V.A.C. equipment controls.

1.04 TESTS

A. Test all electrical components, including starters and heaters, overload equipment, scanner system, all controls, valves, and safety equipment.

B. Test all circulation air portions of the air distribution system(s).

C. Provide a list of all components that have been satisfactorily tested. Notify the Architect, in writing, a week in advance of this test so as to permit his attendance.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15806 - FIRE DAMPERS

1.01 GENERAL

A. Fire dampers shall be furnished and installed where shown on the drawings. Each fire damper shall be provided with access doors.

B. Fire dampers shall be fabricated in compliance with NFPA and shall be U.L. labeled. Approved fire dampers shall be made by Air Balanced, Inc., Model 119, Type B of 319-P, or equal.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15895 - DIFFUSERS, REGISTERS AND GRILLES

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

A. Scope: Extent of air diffuser and register work required in this Section is indicated on the Drawings and schedules and by the requirements of this Section.

B. Types required for project include the following:

1. Ceiling air diffusers.
2. Wall and duct registers and grilles.

1.02 SUBMITTALS

A. Product Data: Submit manufacturer's standard technical product data including capacity ratings, throw, drop, diffusion, terminal velocities, noise levels, adjustability, construction details, finish and mounting details.

B. Shop Drawings.

1. Provide dimensioned shop drawings of linear diffuser mounting, plenum dimensions, plenum connections, damper connections and branch ductwork connections.

a. Draw shop drawings showing plans, sections, mounting details and finishes.
b. Furnish certified test data, including acoustical performance of the air troffer/boot combination with maximum air quantities indicated on the drawings.

C. Schedule: Submit a schedule of proposed air diffusers, registers and grilles, keyed to the Contract Drawings and indicating the proposed type, size, air quantity, pressure drop and location of each device proposed under this Contract.

1. Manufacturer: Same for all diffusers and registers on project.

1.03 QUALITY ASSURANCE

A. ASHRAE: Test and rate air outlets and inlets in certified laboratories under the requirements of ASHRAE Standard 70.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Original Containers: Deliver air diffusers and registers to the site in manufacturer's original containers. Identify on outside of container type and location to be installed.

B. Protect From Damage: Do not install bent, marred or damaged devices. Replace with new. Store indoors, where possible, or outdoors in weatherproof enclosures above grade.

PART 2 - PRODUCTS

2.01 AIR DIFFUSERS AND REGISTERS: GENERAL

A. Construction: Provide devices as specified on drawinngs.

1. Treat steel with zinc phosphate or zinc chromate after fabrication.
2. Grind, polish and factory prime.
3. Factory finish with white baked enamel finish, unless otherwise indicated.
4. Roll or reinforce exterior faces and edges.
5. Ensure mitered joints and butt connections mate within 0.010-inch maximum crack.
6. Surface finish: Smooth within 0.005-inch at welds, joints, clamping points and splices.
7. Offsets and bends: Mitered.
8. Mate devices with the associated duct, plenum or boot to form an airtight joint.

B. Provide as scheduled on Drawings.

2.02 SUPPLY OR RETURN REGISTERS

A. Register Type: Adjustable single or double-deflection type, formed steel or extruded aluminum, as indicated on the Drawings; noise levels of NC 20 or less.

B. Bars: Provide adjustable or fixed face bars and fixed rear bars, as indicated by types on Drawings.

C. Frames: Provide stamped or rolled steel or extruded aluminum frames fitted with felt, neoprene or plastic gaskets.

D. Dampers: If indicated on drawings provide register dampers of formed steel, cadmium plated, gang key operated, opposed blade type, and arranged so that the operating mechanism does not project through any part of the register face.

E. Mounting Hardware: Provide round or countersunk head Phillips screws.

F. Air Extractors: Provide 18 gage frames, 22 gage curved steel blades, fixed pattern, screwed to the duct collar, and sized to match register dimensions.

G. Manufacturer: Subject to compliance with requirements, provide registers of one of the following:

1. Titus Products.
2. Anemostat Products Division, Dynamics Corp.
3. Carnes Co., Division of Wehr Corp.

2.03 RETURN GRILLES

A. Construction: Construct as specified for registers, except omit register damper.

B. Bars: Provide fixed horizontal face bars with 1/2-inch spacing and 35 degree downward blade angle.

C. Filters: If indicated on drawings provide 1-inch throw-away filters for return grilles.

D. Manufacturer: Subject to compliance with requirements, provide grille units of one of the following:

1. Titus Products.
2. Anemostat Products Division, Dynamics Corp.
3. Carnes Co., Division of Wehr Corp.

2.04 CEILING DIFFUSERS

A. Ceiling Diffusers: Provide circular, square or rectangular, as indicated on the Drawings; noise levels as indicated on drawings.

B. Diffuser Edge and Framing Details: Compatible with the type of ceilings in which the diffuser is installed. For plaster ceiling provide plaster frames or plaster rings, set flush with finished ceiling.

C. Materials: Refer to drawings.

D. Access: Provide removable internal parts of circular, square or rectangular diffusers, including volume regulators, diffuser face, dampers and equalizing devices.

1. Allow removal of parts, including internal assembly, without the use of special tools.
2. Do not allow removal of diffuser face to disturb the distribution pattern.

E. Finish: Provide baked enamel finish on visible face. Coordinate color with Architect.

1. Interior and concealed parts: Flat black or dark gray.

F. Adjustable Pattern: Provide adjustable pattern diffuser cones to vary the distribution from horizontal parallel to the ceiling to a downward distribution pattern into the space, not on exposed face.

G Pressure Range: Design to allow equal distribution pattern, both horizontal and vertical, for diffusers with pressure drops from 0.10 to 0.40 inches water gage.

H. Dampers, Diffusers, and Extractors: Products of the same manufacturer.

I. Extractors: Provide adjustable extractors, furnished by the diffuser manufacturer, in each ceiling diffuser where indicated on drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Coordination: Coordinate the location of grilles, registers and diffusers with other trades. Examine areas and conditions under which inlets and outlets are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

1. Examine architectural floor plans, reflected ceiling plans and elevations and arrange for duct taps to be so placed that the installation of air outlets will present a uniform relationship with architectural features, lighting, sprinkler heads, speakers and smoke detectors.
2. On plain walls, if not otherwise indicated, locate sidewall registers approximately 8 inches down from the finished ceilings.
3. Adjust the face and rear bars of supply registers to provide a diffusion pattern such that the terminal velocity point is approximately 70 percent of the "room" width and 5 to 6 feet above the finished floor, at a velocity of 20 to 50 fpm.
4. On projects with reflected ceiling plans, locate outlets to conform to that plan.
5. If no reflected ceiling plans are included in the Contract Documents, coordinate the location of air outlets with other trades before cutting in ceiling and sidewall taps. Provide coordination drawing in shop drawings.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15903 - AUTOMATIC TEMPERATURE CONTROLS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. It is the intent of the District to have a self contained microprocessor installed at, and in place of, the existing Central Panel that will provide a comprehensive energy management system. The purpose of the system is reduce energy consumption without sacrificing space comfort. The existing zone valves will be interfaced with the Energy Management System for day/night control. The Energy Management System is also to be interfaced with the steam boilers.

B. The existing pneumatic temperature control system is in very poor condition. The contractor will be responsible to completely replace the system to restore it to original design. He has the option of reusing existing equipment if some of it can be proven salvageable. The contractor is strongly cautioned that the District is aware of many defective devices and wants them in complete working order. The burden of proof of an existing control working is solely on the contractor.

C. A new air supply system as well as a new zone valve for the Cafeteria zone is needed. It is possible that other zone valves must be replaced as well. No consideration for extras will be entertained if other valves need replacement. The intent is to deliver a completely working system. That includes all pneumatic or pneumatic electric controls, tubing and wiring, whether specifically mentioned or not.

1.02 EQUIPMENT

A. Installer shall furnish and install a Paragon EC 128 Energy Monitoring and Control System. The solid state, 365-day control shall have twelve SPDT outputs, eight analog or digital inputs, and one demand input. Control shall offer keyboard programming or programming via remote communications, allowing auto-answer and alarm dial-out capability. Control shall have four holiday programs with four unique options for holiday scheduling and thirty-two programmable holiday durations from 1 to 366 days each.

B. Control shall have automatic daylight-savings time changeover and leap year correction. Control shall offer a four-digit access code to restrict programming access. Control shall offer duty cycling, temperature dependent or adaptive duty cycling, demand control, temperature control, outdoor reset, optimized start and stop, momentary contract, data gathering and logging. Control shall have ASTRO-DIAL lighting control. Control shall offer the capability of optional additional memory storage using a memory storage module.

C. Control shall maintain the program during power failures for a minimum of four months with a primary lithium battery. Contractor must prove replacement parts are available from wholesalers on Long

Island as well as from the manufacturer. Consideration will be given to the submittal of the Honeywell Delta or the Johnson Metasys. If proposals are submitted directly by manufacturers, the manufacturer must prove they are not the sole source of the system being submitted. The District will not be required to deal with a single source in future negotiations.

1.03 CONTRACTOR QUALIFICATIONS

A. A list of at least three installations identical to the one requested in this bid is to be submitted with this bid. Jobs that do not include remote computer monitoring are unacceptable for the Woods Elementary School project.

1.04 INSTALLATION

A. Contractor is to submit a professionally drawn ozalid schematic showing all wiring and interlocks with the panel. It is the intent to replace the existing Central Panel with a new one. The new panel face will have day/night/auto switches for the six pneumatic zones. Panel Mounted 30# gauges with appropriate labels showing day/night current status will also be provided. The zones are West Classroom, Administration, General Purpose Room, East Classroom, Cafeteria, and Gymnasium.

B. The Contractor will install six building sensors and one outside air sensor. The EC 128 will be programmed for optimal start programming, adaptive duty cycling, time of day function, holidays, alarm dial out, and ASTRO-DIAL. The six building sensors will also function as night zone thermostats. The submittal is to shown all details of how the contractor intends to accomplish the above. The schematic shall be complete with a typed sequence of operation and material data on the schematic. Five sets of technical data sheets and schematics are to be submitted and returned approved before work may begin. The contractor is responsible for all wiring and interlocks necessary whether specifically mentioned or not.

C. The EC 128 is to be mounted in a separate control panel mounted in place of the existing Control Panel located in the Boiler Room. This panel is to include all necessary relays, EP's, wiring, piping, and interface with the existing system. It is the intent of the Engineer not to detail the above piping and wiring. The contractor will provide that detail in his submission. The Engineer will determine if the submittal meets the intent of the specification and require resubmission if necessary.

D. The EC 128 is to be wired so that the boilers shut down whenever the outside air temperature exceeds 60°F or if the building is on night cycle. If one of the sensors records temperature in its zone below its night set back temperature, its zone valve will open and the boiler will fire. The boiler will also remain off until the first building zone switches to day cycle through the optimization feature.

E. The Contractor is to remove the existing air compressors and replace all PRV assemblies. He is to provide a coalescing filter, pop safeties, final filters, gauges, etc., to make a complete and operating day/night pressure system. He is to provide and install

a duplex air compressor rated for 1/3 running time. The minimum size of the duplex system is 1 1/2 horsepower. The compressors are to be mounted on a sixty-gallon tank. The system is to include a refrigerated air dryer, control panel with automatic alternation, vibration pads, all piping and wiring.

F. The existing defective Cafeteria Zone Valve is to be removed and replaced in kind. This includes all steamfitting and pipe covering work. The new valve is to be connected to the new Central Panel.

1.05 REHABILITATION OF EXISTING CONTROLS

A. The definition of the existing temperature control system is any device, tubing, or related equipment supplied or installed by the original temperature control manufacturer and all additions and modifications made to that system made from original construction until the present. The bidding contractor accepts responsibility for all the above regardless of the installer.

B. The intent of the project is for the contractor to locate and identify each and every pneumatic, electric, or pneumatic-electric control device in the plant. If a control manufacturer would normally indicate this type of device on their schematic as supplying or installing it, it is part of this contract. Therefore, items such as boiler controls, pumps, and fan motors are excluded.

C. The contractor shall determine the sequence of operation and insure that the control or controlled device is performing that function in optimum condition. If the device is functional, it will be cleaned, calibrated, or adjusted. If it is defective, it must be repaired or replaced as needed. The building is presented "as is" at the time of bid. Vandalized or missing controls at the time of bid become the contractor's responsibility. Vandalism or willful neglect occurring after the time of contract award must be demonstrated to the owner as such if the contractor anticipates additional compensation.

D. The following is intended to convey the spirit of the specification but does not limit the contractor's liability.

1. Valves: Every pneumatic control valve in the plant must be rebuilt regardless of its current condition. The absolute minimum that must be done to each valve is as follows: replace the disc, replace the packing, insure that the seat is in original condition, and insure that the operator is functional and has no air leaks. All moving parts shall operate as per original design. Failing that, the contractor will replace the valve with a new one at no additional expense to the District.

2. Piping: The pneumatic system must be checked for leaks and demonstrated as tight. The building presently has numerous open-ended leaks. If oil or water contamination is present in any part of the system, it must be purged. Oil will be removed with a freon bubbler. It should be noted that the

District is aware of considerable oil and water presence.

3. Dampers: All dampers are to be lubricated and adjusted for tight close off. Damaged or missing linkage is to be repaired or replaced.

4. Unit vents:

   a. The present sequence calls for the outside air damper to be open simultaneously with the control valve. The control contractor is to replace or modify the valve operator and damper operator so that they follow the sequence of operation detailed below.

   b. When the room thermostat is on a call for full heat, the outside air damper will be closed and the valve open to full flow. As the room temperature rises, the valve will gradually close. On a further rise in room temperature, the outside air damper will begin to open. The mixed air low limit shall be set at 55. The valve low limit shall be set at 60. At no point shall the valve be open simultaneously with the outside air. On fan shut down, the damper shall fully close to the outside air. The valve low limit shall still be in control of the valve through the room thermostat.

   c. All controls must be checked for sequence of operation during the heating season as well as cooling season. Unit vents, H & V units, AC units, fan coils, unit heaters, cabinet heaters, central panel controls, day/night system, exhaust fans, for example, must all be seen in actual operation and perform according to the original sequence of operation, unless that sequence has been modified by this specification. In case of conflict, this specification applies.

   d. A signed sticker applied at the control device is required inside every control cabinet, unit vent, or other related equipment. The burden of proof that the control was looked at and proven functional is the contractor's responsibility. Failure to apply stickers may be cause for redoing that system.

   e. It should be noted that the contractor will be required to demonstrate entire systems functioning when the project is complete. If a pattern develops of problems with the controls at the time of inspection, the contractor is open to the liability of redoing entire sections of the building. Again, the intent is to demonstrate a complete and functional system and to repair or replace as necessary to accomplish that end.

   f. The focus of this energy management program is to reduce electrical and fuel usage. Lowest bid will not be the only consideration. The District intends to consider the following factors in its decision.

      1. The contractor is to submit a signed statement

from the Chief or Head Custodian of the building that he has inspected the building temperature control system. Failure to submit this with the bid will automatically disqualify the bidder. The District will not entertain uninformed bids.

2. The District intends to use this system immediately. It is essential that each bidding contractor be adequately staffed to man this project in a timely manner. The contractor will submit a list of names of field technicians who have experience installing this system. The minimum number of field technicians each bidder must have to qualify is five.

3. Demonstrated competence in computer technology. The District intends to incorporate the alternates specified at the present or future dates. The technical submittal must include the names and qualifications of company personnel who will be involved.

4. Cost.

1.06 ALTERNATES

A. Alternate No. 1: Pulse Meter.

1. District will arrange with and pay LILCO for the installation of a pulse meter. Contractor will connect to this pulse meter and provide readout on the EC 128. It is the contractor's responsibility to calibrate the EC 128 accurately to the LILCO meter.

B. Alternate No. 2: Monitoring and Calibration Contract.

1. Provide a monitoring and calibration service contract. The contractor is to take at least three readings a month and provide a monthly report to the District on the performance of the system with recommendations on how the building profile may be improved for both energy savings and comfort. A technician is to be provided for one full day a month a calibrate and check all parts of this system.

C. Alternate No. 3: Computer Driven Capability.

1. Provide computer driven energy management capability. This alternate includes; Provide and install the communications hardware, modems, and programming at the EC 128. Provide and install software into the District computer. The EC 128 is IBM PC compatible. The contractor is not responsible for providing a computer to the District as part of the alternate if the District does not own a compatible PC.

2. The District will arrange for the installation of a telephone modem on its equipment or pay the contractor for the installation of the modem. Contractor will load software

into his computer to enable him to communicate with the Woods Road Elementary School energy management system as directed. The District will provide the installation of a telephone jack adjacent to the EC 128. This will be a dedicated phone line, not run through the switchboard.

END OF SECTION

DIVISION 15 – MECHANICAL

SECTION 15990 – HVAC TESTING, ADJUSTING AND BALANCING

PART 1 – GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

A. Scope: Extent of HVAC testing, adjusting and balancing work required by this Section is indicated on the drawings, in schedules, and by the requirements of this Section.

B. Testing, Adjusting and Balancing (TAB) contractor to meet or exceed all uniform code testing requirements. (e.g. ASHRAE, ASME, IMC, Etc.)

C. Systems: Testing, adjusting and balancing specified in this Section includes the following systems:

1. Air systems including supply, return and exhaust.
2. Hydronic systems including heating, chilled water.

D. Related Sections: Refer to other Division 15 sections for:

1. Fans
2. Air Terminal Units
3. Pumps
4. Hydronic Piping Systems
5. Ductwork
6. Boilers
7. Chillers and Cooling Towers

1.02 QUALITY ASSURANCE

A. Agency Qualifications

1. The qualifications of the TAB contracting firms shall be submitted, within 30 days of notice to proceed. Recent projects shall be listed and described for the company. Names and telephone numbers of the project contractors and facility managers will be provided.

2. The Owner must approve in writing the qualifications of both the company and the lead technician.

3. Qualifications of TAB Firm Personnel:

1. A minimum of one professional engineer with current registration is required to be in the permanent employment of the firm for supervision and direction in the work performed. This engineer shall be totally responsible for developing job site data as required for test procedures.

2. All personnel used on job site shall be either professional engineer or technicians, who shall have been permanent, full-time employees of firm for a

minimum of six (6) months prior to start of work for that specified project.

3. The qualifications of the TAB lead site technician who will remain on site during all TAB work, within 30 days of notice to proceed. Recent projects shall be listed and described for the company. Names and telephone numbers of the project contractors and facility managers will be provided.

4. The Owner must approve in writing the qualifications of both the company and the lead technician.

B. Tester's Qualifications: A specialist certified by the National Environmental Balancing Bureau (NEBB) or Associated Air Balance Council (AABC) with at least 3 years of experience in those testing, adjusting and balancing requirements similar to those required for this project, who is not the installer of the system to be tested and is otherwise independent of the project.

C. Codes and Standards: Provide testing, adjusting and balancing conforming to American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), American National Standards Institute (ANSI), and either NEBB or AABC the following:

1. American National Standards Institute (ANSI): Comply with the following:

a. S1.4Specification For Sound Level Meters
b. S1.11Specification for Octave-Band and Fractional-Octave-Band Analog and Digital Filters

2. American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE): Comply with ASHRAE recommendations pertaining to measurements, instruments, and testing, adjusting, and balancing.

3. NEBB or AABC: Comply with NEBB'S "Procedural Standards for Testing, Adjusting, Balancing of Environmental Systems" or comply with AABC MN-1 "National Standards," as applicable to mechanical air and hydronic distribution systems, and associated equipment and apparatus.

D. Calibration of Testing Instruments: All measurement instruments used for testing, adjusting, balancing, and commissioning shall be calibrated. The time between the most recent calibration data and the final test report date shall not be over 1 year.

1.03 SUBMITTALS

A. Test Reports: Provide certified test reports, signed by the test and balance supervisor who performed the work. The final reports shall include identification and types of instruments used, and their most recent calibration date and calibration date.

B. Standards: Deliver a copy of either NEBB or AABC standards for testing and balancing work associated with the project. This document shall serve as specific guidance to balancers as to minimum requirements.

C. Maintenance Data: Include, in maintenance manuals, copies of balance test reports and identification of instruments.

D. Qualifications: Submit the individual qualifications of all persons responsible for supervising and performing the actual work.

1.04 AGENDA

A. Agenda: A preliminary report and agenda shall be submitted and approved prior to the start of testing and balancing work.

1. Review Drawings and Specifications prior to installation of any of the affected systems, and submit a report indicating any deficiencies in the systems that would preclude the proper adjusting, balancing, and testing of the systems.

2. The agenda shall include a general description of each air and water system with its associated equipment and operation cycles for heating, intermediate, and cooling.

3. The agenda shall include a list of all air and water flow and air terminal measurements to be performed.

4. The agenda shall incorporate the proposed selection points for sound measurements, including typical spaces as well as sound sensitive areas.

5. The agenda shall also include specific test procedures and parameters for determining specified quantities (e.g. flow, drafts, sound levels) from the actual field measurements to establish compliance with contract requirements. Samples of forms showing application of procedures and calculations to typical systems shall be submitted.

6. Specific test procedures for measuring air quantities at terminals shall specify type of instrument to be used, method of instrument application (by sketch) and factors for:

a. Air terminal configuration.
b. Flow direction (supply or exhaust).
c. Velocity corrections.
d. Effective area applicable to each size and type of air terminal.
e. Density corrections.

7. The agenda shall include identification and types of measurement instruments to be used, and their most recent calibration date and calibration date.

1.05 JOB CONDITIONS

A. General: Do not proceed with testing, adjusting and balancing work until the following conditions have been met.

1. Work has been completed and is operable. Ensure that there is no latent residual work yet to be completed on the tested equipment.

2. Work scheduled for testing, adjusting and balancing is clean and free from debris, dirt and discarded building materials.

3. All architectural openings (doors, windows, and other openings) which may affect the operation of the system to be tested, adjusted, and balanced shall at their normal states.

4. All related mechanical systems which may affect the operation of the system to be tested, adjusted, and balanced shall be at their normal operating conditions. Coordinate tests with Controls Contractor.

5. Air handling unit filters are not "loaded"; Mechanical Contractor shall replace, if required, prior to balancing.

PART 2 - PRODUCTS

2.01 PATCHING MATERIALS

A. Material: Seal, patch and repair ductwork, piping and equipment drilled or cut for testing purposes.

1. Plastic plugs with retainers may be used to patch drilled holes in ductwork and housings.

2. Piping shall be capped with materials the same as the piping system.
3. Insulation shall be neatly hemmed with metal or plastic

2.02 TEST INSTRUMENTS

A. Standards: Utilize instruments and equipment of type, precision, and capacity as recommended in the following standards:

1. NEBB "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems."

2. AABC Manual MN-1, "AABC National Standards".

B. Test Instruments: All instruments used for measurements shall be accurate and calibration histories for each instrument shall be available for examination. Each test instrument shall be calibrated by an approved laboratory or by the manufacturer. Owner's representative has the right to request instrument recalibration, or the use of other instruments and test methodology, where accuracy of readings is questionable.

C. Additional Instruments: Permanently installed measuring instruments , such as temperature and pressure gauges, shall be checked against transfer standard instruments. Any instrument which does not meet specification requirement shall be replaced or recalibrated.

D. Cone Instruments: Employ manufactured enclosure type cones, capable of air volume direct readings, for all diffuser air flow measurements. The readout meters shall meet calibration requirements.

PART 3 - EXECUTION

3.01 PROCEDURES AND INSTRUMENTS, GENERAL

A. Requirements: All systems and components thereof shall be adjusted to perform as required by drawings and specifications.

B. Test Duration: Operating tests of heating and cooling coils, fans, and other equipment shall be of not less than four hours duration after stabilized operating conditions have been established. Capacities shall be based on temperatures and air and water quantities measured during such tests.

C. Instrumentation: Method of application of instrumentation shall be in accordance with the approved agenda.

1. All instruments shall be applied in accordance with the manufacturer's certified instructions.

2. All labor, instruments, and appliances required shall be furnished by the balancer. Permanently installed instruments used for the tests (e.g., flow meters and Btu meters) shall not be installed until the entire system has been cleaned and ready for operation.

3.02 AIR SYSTEM PROCEDURES

A. Adjustments: Adjust all air handling systems to provide approximate design air quantity to or through, each component, and to maintain stable and comfortable interior temperatures, free of drafts or stagnant conditions. Adjusting and balancing of all systems shall be conducted during periods of the year approximating maximum seasonal operation. Verify operating parameters prior to start of balancing. Laboratory doors shall be closed and fume hood sashes full open, and all other ancillary systems in simultaneous operation. Coordinate with automatic control system operation.

B. Balance: Flow adjusting (volume control) devices shall be used to balance air quantities (i.e., proportion flow between various terminals comprising system) to the extent that their adjustments do not create objectionable air motion or sound (i.e., in excess of specified limits).

1. Balancing between runs (submains, branch mains, and branches) generally shall be accomplished by flow regulating devices at, or in, the divided-flow fitting.

2. Restriction imposed by flow regulating devices in or at terminals shall be minimal. Final measurements of air quality shall be made after the air terminal has been adjusted to provide the optimum air patterns of diffusion.

C. Fan Adjustment: Total air system quantities, generally, shall be varied by adjustment of fan speeds or axial-flow fan wheel blade pitch. Damper restriction of a system's total flow may be used only for systems with direct-connected fans (without adjustable pitch blades), provided system pressure is less than 1/2-inch W.G. and sound level criteria is met.

D. Air Measurement: Where air quantity measuring devices are specified in other sections such systems shall be used as a cross-check of portable measuring equipment.

1. Except as specifically indicated herein, pitot tube traverses shall be made of each duct to measure air flow therein. Pitot tubes, associated instruments, traverses, and techniques shall conform to the ASHRAE "Handbook Fundamentals Inch Pound Edition."

2. For ducts serving modular office areas with movable partitions, which are subject to change, pitot tube traverses may be omitted provided the duct serves only a single room or space and its design volume is less than 2000 cfm. In lieu of pitot tube traverses, air flow in the duct shall be determined by totalling volume of individual terminals served, measured as described herein.

3. Where duct's design velocity and air quantity are both less than 1000 (fpm/cfm), air quantity may be determined by measurements at terminals served.

E. Test Holes: Test holes shall be in a straight duct, as far as possible downstream from elbows, bends, take-offs, and other turbulence generating devices, to optimize reliability of flow measurements.

F. Air Terminal Balancing: Generally, measurement of flow rates by means of velocity meters applied to individual terminals, with or without cones or other adapters, shall be used only for balancing. Measurement of air quantities at each type of air terminal (inlet and outlet) shall be determined by the method approved for the balancing agenda.

G. Air Motion: Air motion and distribution shall be as specified and indicated on Drawings.

3.03 WATER SYSTEM PROCEDURES

A. Adjustment: All heating, cooling and condensing water systems shall be adjusted to provide required quantity to or through each

component. Verify operating parameters prior to start of balancing.

B. Metering: Water quantities and pressures shall be measured with calibrated meters.

1. Venturi tubes, orifices, or other metering fittings and pressure gauges shall be used to measure water flow rates and balance systems. Systems shall be adjusted to provide the approved pressure drops through the heat transfer equipment (coils [except room units], converters, etc.) prior to the capacity testing.

2. Where flow metering fittings are not installed, in air/water type heat transfer equipment, flow balance shall be determined by measuring the air side energy differential across the heat transfer equipment. Measurement of water temperature differential shall be performed with the air system, adjusted as described herein, in operation.

C. Automatic Controls: Automatic control valves shall be positioned for full flow through the heat transfer equipment of the system during tests.

D. Flow: Flow through bypass circuits at three-way valves shall be adjusted to equal that through the supply circuit, when the valve is in the bypass position.

E. Distribution: Adjustment of distribution shall be effected by means of balancing devices (cocks, valves, and fittings) and automatic flow control valves as provided; service valves shall not be used.

1. Where automatic flow control valves are utilized in lieu of Venturi tubes, only pressure differential need be recorded, provided that the pressure is at least the minimum applicable to the tag rating.

F. Special Procedures: Where available pump capacity (as designed) is less than total flow requirements of individual heat transfer units of system served, full flow may be simulated by the temporary restriction of flow to portions of the system; specific procedures shall be delineated in the agenda.

3.04 HEAT EXCHANGER CAPACITY VERIFICATION

A. Air coil capacities shall be verified from air side measurement data. Capacities of coils shall be the difference of the energy carried by the air between the up stream and down stream of the coils.

B. The measured air flow rate for the fan may be used for air coil capacity calculations providing no ducted bypassing of coil is occurring.

C. Capacity verifications shall be performed after air and water systems have been balanced. Heat exchangers using steam as the

exchange medium shall have the steam measured and adjusted to the specified pressure.

D. False load shall be applied if the upstream air or water does not meet the specified conditions at the time of test.

3.05 REPORTS

A. Submittals: Three copies of the reports described herein, covering air and water system performance, air motion (fpm), and sound pressure levels, shall be submitted prior to final tests and inspection.

B. Instrument Records: Types, serial numbers, and dates of calibration of all instruments shall be included.

C. Reports: Reports shall conspicuously identify items not conforming to contract requirements, or obvious malfunction and deficiencies.

3.06 AIR SYSTEM DATA

A. Report: The report shall include for each air handling system the data listed below.

1. Equipment (Fan or Factory Fabricated Station Unit):

a. Installation data

1. Manufacturer and model
2. Size
3. Arrangement, discharge and class
4. Motor hp, voltage, phase, cycles, and full load amps
5. Location and local identification data

b. Design data

1. Data listed in schedules on drawings and specifications.

c. Fan recorded (test) data

1. cfm
2. Static pressure
3. rpm
4. Motor operating amps motor operating bhp

2. Duct Systems:

a. Duct air quantities (maximum and minimum) - main, submains, branches, outdoor (outside) air, total air, and exhaust

1. Duct size(s)
2. Number of Pitot tube (pressure measurements)

3. Sum of velocity measurements (Note: Do not add pressure measurements)
4. Average velocity
5. Recorded (test) cfm design cfm

b. Individual air terminals

1. Terminal identification supply or exhaust, location and number designation
2. Type size, manufacturer and catalog identification applicable factor for application, velocity, area, etc., and designated area
3. Design and recorded velocities- fpm (state "core," "inlet," etc., as applicable)
4. Design and recorded quantities -cfm deflector vane or diffusion cone settings

3.07 WATER SYSTEM DATA

A. Report: The certified report for each water system shall include the data listed below.

1. Pumps:

a. Installation data

1. Manufacturer and model
2. Size
3. Type drive
4. Motor hp, voltage, phase, and full load amps

b. Design data

1. gpm
2. Head
3. rpm, bhp, and amps

c. Recorded data

1. Discharge pressures (full-flow and no-flow)
2. Suction pressures (full-flow and no-flow) operating head
3. Operating gpm (from pump curves if metering is not provided) no-load amps (where possible)
4. Full-flow amps
5. No-flow amps

2. Air Heating and Cooling Equipment:

a. Design data

1. Load in Btu or MBh
2. gpm

3. Entering and leaving water temperature
4. Entering and leaving air conditions (DB and WB)

b. Recorded data

1. Type of equipment and identification (location or number designation)
2. Entering and leaving air conditions (DB and WB)
3. Entering and leaving water temperatures

3. Water Chilling Units:

a. Installation data

1. Manufacturer and model
2. Motor hp, voltage, cycles, phase, and full load amps
3. Part load amperes
4. gpm - chiller and condenser
5. Water pressure drop - chiller and condenser
6. Entering and leaving water temperature - chiller and condenser

b. Recorded data (chiller and condenser)

1. gpm
2. Water pressure drop
3. Entering and leaving water temperature
4. Amperes

3.08 FINAL COMMISSIONING TESTS, INSPECTIONS AND ACCEPTANCE

A. Scope: Test shall be made to demonstrate that capacities and performance of air and water systems comply with contract requirements.

1. At the time of final inspection, recheck random selection of data (water and air quantities, air motion, and sound levels) recorded in the balancing report. All laboratories shall be rechecked for satisfactory air flow and motion on vicinity of and through hoods.

2. Points and areas for recheck shall be selected by the Owner's Representative.

3. Measurement and test procedures shall be the same as approved for work forming basis of certified report.

4. Selections for recheck (specific plus random), in general, will not exceed 25 percent of the total number tabulated in the report, except that special air systems may require a complete recheck for safety reasons.

B. Retests: If random tests elicit a measured flow deviation of 10 percent or more from, or a sound level of 2 db or more greater than, that recorded in the report listings, as 10 percent or more of the rechecked selections, the report shall be automatically

rejected. In the event the report is rejected, all systems shall be readjusted and tested, new data recorded, new certified reports submitted, and new inspection tests made, all at no additional cost.

C. Marking of Settings: Following final acceptance of balance reports, the settings of all valves, splitters, dampers, and other adjustment devices shall be permanently marked so that adjustment can be restored if disturbed at any time. Devices shall not be marked until after final acceptance.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15997 MECHANICAL TESTING REQUIREMENTS

PART 1 – GENERAL

1.01 INCLUDED SYSTEMS AND EQUIPMENT

A. The following is a partial list of the equipment and system test requirements included in this section:

1 Air handler systems
2. Building management control system & energy management
3. Hydronic piping and HVAC Pumps
4. Exhaust fans
5. Indoor air climate control--misc. systems
6. Indoor air quality (IAQ)
7. Terminal unit
8. Test and balance (TAB) work
9. Air Conditioning Equipment

1.02 DESCRIPTION

A. This section specifies the functional testing requirements for Division 15 systems and equipment. From these requirements, the Commissioning Authority (CA) shall develop step-by-step procedures to be executed by the Subs or the Commissioning Authority. The general functional testing process, requirements and test method definitions are described in Section 01810 Commissioning. The test requirements for each piece of equipment or system contain the following:

1. The contractors responsible to execute the tests, under the direction of the CA.
2. A list of the integral components being tested.
3. Construction checklists associated with the components.
4. Functions and modes to be tested.
5. Required conditions of the test for each mode.
6. Special procedures.
7. Required methods of testing.
8. Required monitoring.
9. Acceptance criteria.
10. Sampling strategies allowed.

1.03 PREREQUISITES

A. The following applicable generic prerequisite checklist items are required to be listed on each written functional test form and be completed and checked off by CA prior to functional testing.

B. All related equipment has been started up and start-up reports and construction checklists submitted and approved ready for functional testing.

C. All control system functions for this and all interlocking systems are programmed and operable per contract documents,

including final set points and schedules with debugging, loop tuning and sensor calibrations completed.

1. Piping system flushing complete and required report approved.
2. Water treatment system complete and operational.
3. Vibration control report approved (if required).
4. Test and balance (TAB) complete and approved for the hydronic system.
5. All A/E punch list items for this equipment corrected. These functional test procedures reviewed and approved by installing contractor.
6. Safeties and operating ranges reviewed by the CA.
7. Test requirements and sequences of operation attached.
8. Schedules and set points attached.
9. False loading equipment, system and procedures ready.
10. Sufficient clearance around equipment for servicing.
11. Record of all values for pre-test set points changed to accommodate testing has been made and a check box provided to verify return to original values (control parameters, limits, delays, lockouts, schedules, etc.).
12. Other miscellaneous checks of the pre-functional checklist and start-up reports completed successfully.

1.04 MONITORING

A. Monitoring is a method of testing as a stand-alone method or to augment manual testing.

B. All points listed in the required monitoring section of the test requirements which are control system monitored points shall be trended by the Temperature Controls Contractor. Other points shall be monitored by the CA using data loggers. At the option of the CA, some control system monitoring may be replaced with data logger monitoring. At the CA's request, the Temperature Controls Contractor shall trend up to 20% more points than listed herein at no extra charge.

C. Hard copies of monitored data must be in columnar format with time down the left column and at least 5 columns of point values on the same page.

D. Graphical output is desirable, and will be required for all output, if the system can produce it.

PART 2 - PRODUCTS

(NOT APPLICABLE)

PART 3 - EXECUTION

The following Sample test procedures are representative of the level of detail required for this project. The Owner reserves the right to work with the Contractor to amend these data sheets as necessary at no extra cost to the Owner.

3.01 AIR HANDLER UNITS (AHU / RTU)

A. Parties Responsible to Execute Functional Test

1. Temperature Controls Contractor: operate the controls to activate the equipment as needed.

2. CA: to witness, direct and document testing.

B. Integral Components or Related Equipment Being Tested
Construction Checklist ID PC-_____
PC-_____

1. AHU/RTU and components (fans, coils, valves, ducts, VFD)
2. Heat recovery coil, humidifier or evaporative cooling sections.

C. Prerequisites The applicable prerequisite checklist items listed in the beginning of Section 15997 shall be listed on each functional test form and checked off prior to functional testing. The commissioning agent will also spot-check misc. items and calibrations on the construction checklists previously completed by the installer, before the beginning of functional testing.

D. Functions/Modes Required To Be Tested, Test Methods and Seasonal Test Requirements

The following testing requirements are an addition to and do not replace any testing requirements elsewhere in this Division.

Function / Mode	Test Method Manual, Monitoring, Either or Both[3]	Required Seasonal Test[1]
General 1. Test each sequence in the sequence of operations, and other significant modes and sequences not mentioned; including startup, shutdown, unoccupied & manual modes and power failure. Test functionality of this piece of equipment or system in all control strategies or interlocks with which it is associated.	Manual	
In addition to, or as part of (1) above, the following modes or tests are required:		
2. Mixed & supply air, & reset temperature control functions.	Both	
3. Economizer functions.	Both	Cooling
4. SF, and exhaust fan interlocks.	Either	
5. No CCV flow when there is HCV flow.	Both	
6. CCV & HCV modulation & positive shutoff (no leak-thru).	Manual	
7. Duct static pressure (SP) control.	Both	
8. Exhaust fan tracking and building SP.	Monitoring	

	Function / Mode	Test Method Manual, Monitoring, Either or Both[3]	Required Seasonal Test[1]
9.	VFD (or inlet vanes) operation on SF and RF: modulation to minimum, control system PID, proportional band of speed vs controlling parameter, constancy of static pressure, verification of program settings, alarms, etc.	Both	[2]
10.	Damper interlocks and correct modulation in all modes, including smoke and fire dampers.	Manual	
11.	Temperature difference across HC & CC per specifications.	Manual	
12.	Verification of minimum OSA control through varying VAV box positions.	Either	[2]
13.	Heating and cooling coils freeze protection.	Manual	[2]
14.	Branch duct control damper control.	Manual	
15.	Night low limit, morning warm-up cycle.	Either	
16.	Heat recovery operation.	Monitoring	
17.	Verify TAB reported SF cfm with control system reading.	Manual	[2]
18.	All alarms (low limits, high static, etc.).	Manual	
19.	Heating and cooling coil capacity test, optional.	Manual	Design
20.	Sensor and actuator calibration checks: on duct static pressure sensor on SAT, MAT, OSAT, OSA & RA damper and valve positions, SF cfm reading with TAB, and other random checks (EMS readout against hand-held calibrated instrument or observation must be within specified tolerances)	Manual	
21.	Verify schedules and setpoints to be reasonable and appropriate		

[1]Cooling season, Heating season or Both. "Design" means within 5°of season design (ASHRAE 2 1/2%), or 95% of loading design. A blank cell denotes no special seasonal test is required and that test can be executed during any season, if condition simulation is appropriate.

[2]Seasonal test not required if seasonal conditions can be adequately simulated.

[3]Refer to Special Procedures

E. Special Procedures (other equipment to test with, etc.; reference to function ID)

1. Reduced Testing for Smaller Units. For standard application AHU's less than 15 tons, the following modifications to the testing requirements apply: 1) either Manual or Monitoring will satisfy the verification

requirement--where both is listed, choose one. 2) Testing Modes 6, 8, 11, 13 and 16 is not required.

F. Required Monitoring

1. All points listed below which are control system monitored points shall be trended by the Temperature Controls Contractor. Other points shall be monitored by the CA using data loggers. Refer to the Monitoring section at the beginning of Section 15997 for additional monitoring details.

Point	Time Step (min.)	Minimum Time Period of Trend	Hard Copy? (Y/N)	ASCII File? (Y/N)	Function Being Tested
For each AHU being tested:					
RAT	5	5 days incl. weekend	Y	Y	1-3, 5
SAT	5	5 days incl. weekend	Y	Y	1-3, 5
CC LAT (optional)	5	5 days incl. weekend	Y	Y	1-3, 5
HC LAT (optional)	5	5 days incl. weekend	Y	Y	1-3, 5
MAT	5	5 days incl. weekend	Y	Y	1, 3
Indoor WB or enthalpy, if enthalpy economizer	5	5 days incl. weekend	Y	Y	1, 3
SF speed, if variable, else status	5	5 days incl. weekend	Y	Y	1, 5-9
RF speed, if variable, else status	5	5 days incl. weekend	Y	Y	1, 5-9
Duct SP	5	5 days incl. weekend	Y	Y	1, 7, 9
Building SP differential	5	5 days incl. weekend	Y	Y	8
OSAT	5	5 days incl. weekend	Y	Y	All
OSA-WB or enthalpy, if enthalpy economizer	5	5 days incl. weekend	Y	Y	1, 3
Indoor dry-bulb zones (expected to be most problematic)	5	5 days incl. weekend	Y	Y	All

Remarks:

CCV position (optional)
HCV position (optional)
SF cfm not required if not monitored
RF cfm not required if not monitored

G. Acceptance Criteria (referenced by function or mode ID)

1. 1-21. For the conditions, sequences and modes tested, the AHU/RTU, integral components and related equipment respond to varying loads and changing conditions and parameters appropriately as expected, as specified and according to acceptable operating practice.

2. AHU/RTU with supporting systems shall be able to maintain the SA temperature within 1.0F either side of the deadband of the current setpoint without excessive hunting.

3. AHU/RTU and controls shall control the duct static pressure so that it does not drift more than an amount equal to 10% of the setpoint value either side of the deadband without excessive hunting.

H. Sampling Strategy for Identical Units

1. All identical AHU's/RTU's over 15 tons shall not have any sampling--test all units. However, 25% of the units may have monitoring be the verification method for modes listed with Monitoring or Both as testing methods, with no less than three units being fully tested per the above requirements.

2. All identical AHU's/RTU's equal to or less than 15 tons shall be sampled: Randomly test at least 50% of each group of identical equipment (the 1st sample) per the above tests. In no case test less than three units in each group. If 20% of the units in the first sample fail the functional performance tests, test another the remaining 50%, fully at the contractor's expense. This sampling applies to the testing subsections. That is, if calibration is off on more than 10% of the tested piece of equipment, then another sample shall have calibrations checked, but not all other tests need to be done on the second sample.

3. All units not included in the sampling testing and monitoring shall be fully monitored for the monitoring modes listed above in the monitoring section.

3.02 BOILER SYSTEM (HEATING WATER)

A. Parties Responsible to Execute Functional Test

1. Temperature Controls Contractor: operate the controls, as needed.

2. HVAC mechanical contractor or vendor: assist in testing sequences.

3. CA: to witness, direct and document testing.

B. Integral Components or Related Equipment Being Tested

		Construction Checklist ID
1.	Boiler	PC-____
2.	Primary HW supply pumps	PC-____
3.	Heating water piping system	PC-____
4.	Secondary HW supply pumps	PC-____
5.	VFD on secondary pumps	PC-____

C. Prerequisites The applicable prerequisite checklist items listed in the beginning of Section 15997 shall be listed on each functional test form and checked off prior to functional testing. The commissioning agent will also spot-check misc. items and calibrations on the construction checklists previously completed by the installer, before the beginning of functional testing.

D. Functions / Modes Required To Be Tested, Test Methods and Seasonal Test Requirements
The following testing requirements are in addition to and do not replace any testing requirements elsewhere in this Division.

Function / Mode	Test Method Manual, Monitoring, Either or Both	Required Seasonal Test[1]
General 1. Test each sequence in the sequence of operations, and other significant modes and sequences not mentioned; including startup, shutdown, unnoccupied & manual modes and power failure. Test functionality of this piece of equipment or system in all control strategies or interlocks that it is associated with.	Manual	
In addition to, or as part of (1) above, the following modes or tests are required:		
2. Primary Side. Lead/lag staging of boilers, optimization, capacity modulation, and primary HW supply pumps.	Both	Heating
3. Secondary Side. Secondary WH supply pump staging, bypass valve operation, if no VFD and HWT reset. VFD operation: modulation to minimum, control system PID, proportional band of speed vs controlling parameter, verification of program settings,, alarms, etc.	Both	Heating
4. Check all alarms and safeties (high and low pressure and temperature, etc.), PRV and flow switch functions	Manual	
5. Test each possible lead boiler as lead boiler, and each pump as lead pump. Test pump lockouts.	Manual	
6. Flue gas analysis verification, optional	Manual	
7. Efficiency and capacity tests, optional	Manual	Heating

Function / Mode	Test Method Manual, Monitoring, Either or Both	Required Seasonal Test[1]
8. Verify boiler inlet/outlet pressures with startup report and manufacturer's recommendations	Manual	
9. Sensor and actuator calibration checks on: HWST, HWRT, pressure sensor controlling pump speed, mixing valve and other random checks (EMS readout against hand-held calibrated instrument must be within 0.5°F for temps. or within a tolerance equal to 10% of the pressure setpoint, with a test gage)	Manual	
10. Constancy of differential pressure (pump control parameter)	Monitoring	Heating
11. Verify schedules and setpoints to be reasonable and appropriate		

[1]Cooling season, Heating season or Both. "Design" means within 5°of season design (ASHRAE 2 1/2%), or 95% of loading design. A blank cell denotes no special seasonal test is required and that test can be executed during any season, if condition simulation is appropriate.

E. Special Procedures (other equipment to test with, etc.; reference to function ID)

1. False load boiler, if necessary.

F. Required Monitoring

1. All points listed below which are control system monitored points shall be trended by the Temperature Controls Contractor. Other points shall be monitored by the CA using data loggers. Refer to the Monitoring section at the beginning of Section 15997 for additional monitoring details.

Point	Time Step (min.)	Minimum Time Period of Trend	Hard Copy? (Y/N)	ASCII File? (Y/N)	Function Being Tested
For each boiler and pump:					
Boiler current or status	5	5 days incl. weekend	Y	Y	1-3
HWST	5	5 days incl. weekend	Y	Y	1, 3
HWRT	5	5 days incl. weekend	Y	Y	1, 3
OSAT-DB	5	5 days incl. weekend	Y	Y	1-3
HWS primary pump current or status	5	5 days incl. weekend	Y	Y	1, 2

Point	Time Step (min.)	Minimum Time Period of Trend	Hard Copy? (Y/N)	ASCII File? (Y/N)	Function Being Tested
HWS secondary pump speed, if variable	5	5 days incl. weekend	Y	Y	1, 3
HWS secondary pump flow rate, if in EMS	5	5 days incl. weekend	Y	Y	1, 3
HWS secondary pump speed controlling parameter value	5	5 days incl. weekend	Y	Y	1, 3, 10

Remarks:

G. Acceptance Criteria (referenced by function or mode ID)

1. 1-11. For the conditions, sequences and modes tested, the boilers, integral components and related equipment respond to varying loads and changing conditions and parameters appropriately as expected, as specified and according to acceptable operating practice.

2. Boiler shall maintain the supply water set point to within +/- 1.0F of set point dead band without excessive hunting.

3. 9.-10. Pumping system and controls shall maintain the current desired pressure set point to within an amount equal to 10% of the set point value either side of the dead band without excessive hunting.

H. Sampling Strategy for Identical Units

1. No sampling, test all.

3.03 BUILDING AUTOMATION SYSTEM (BAS)

A. Parties Responsible to Execute Functional Test

1. Temperature Controls Contractor: operate the controls to activate the equipment.

2. CA: to witness, direct and document testing.

B. Integral Components or Related Equipment Being Tested

	Construction Checklist ID
1. Building Automation System	PC-_____

2. All construction checklists of controlled equipment

C. Prerequisites The applicable prerequisite checklist items listed in the beginning of Section 15997 shall be listed on each functional test form and checked off prior to functional testing. The commissioning agent will also spot-check misc. items and calibrations on the construction checklists previously completed

by the installer, before the beginning of functional testing.

D. A significant part of the BAS functional testing requirements is the successful completion of the functional tests of equipment the BAS controls or interlocks with. Uncompleted equipment functional tests or outstanding deficiencies in those tests lend the required BAS functional testing incomplete.

E. Integral or stand-alone controls are functionally tested with the equipment they are attached to, including any interlocks with other equipment or systems and thus are not covered under the BAS testing requirements, except for any integrated functions or interlocks listed below.

F. In addition to the controlled equipment testing, the following tests are required for the BAS, where features have been specified. The following testing requirements are in addition to and do not replace any testing requirements elsewhere in the specifications.

Function / Mode	Test Method Manual (demonstration), Monitoring, Either or Both
MISC. FUNCTIONS	
1. All specified functions and features are set up, debugged and fully operable	Verbal discussion of features
2. Power failure and battery backup and power-up restart functions	Demonstration
3. Specified trending and graphing features demonstration	See equipment trends
4. Global commands features	Demonstration
5. Security and access codes	Demonstration
6. Occupant over-rides (manual, telephone, key, keypad, etc.)	Demonstration
7. O&M schedules and alarms	Demonstration
8. Scheduling features fully functional and setup, including holidays	Observation in terminal screens or printouts
9. Date and time setting in central computer and verify field panels read the same time	Demonstration
10. Included features not specified to be setup are installed (list)	Demonstration
11. Occupancy sensors and controls	Demonstration
12. Demonstrate functionality of field panels using local operator keypads and local ports (plug-ins) using portable computer/keypad	Demonstration of 100% of panels and 10% of ports
13. All graphic screens and value readouts completed	Demonstration
14. Setpoint changing features and functions	Done during equipment testing
15. Communications to remote sites	Demonstration
16. Sensor calibrations	Sampled during equipment tests
17. “After hours” use tracking and billing	

Function / Mode	Test Method Manual (demonstration), Monitoring, Either or Both
18. Final as-builts or redlines (per spec) control drawings, final points list, program code, setpoints, schedules, warranties, etc. per specs, submitted for O&Ms.	Observation
19. Verify that points that are monitored only, having no control function, are checked for proper reporting to BAS.	Observation
INTEGRATED TESTS	
20. Fire alarm interlocks and response	Demonstration
21. Duty cycling (if specified)	Monitoring
22. Demand limiting (including over-ride of limiting)	Monitoring
23. Sequential staging ON of equipment	Either
24. Optimum start-stop functions	Monitoring
25. All control strategies and sequences not tested during controlled equipment testing	Either
26. Other integrated tests specified in the contract documents	
27. Security system interlocks	Demonstration
28. Fire protection and suppression systems	Demonstration

G. Special Procedures (other equipment to test with, etc.; reference to function ID) None

H. Additional Required Monitoring

1. Besides the trending and monitoring required with the functional testing of equipment, all points listed below which are control system monitored points shall be trended by the Temperature Controls Contractor. Other points shall be monitored by the CA using data loggers. Refer to the Monitoring section at the beginning of Section 15997 for additional monitoring details.

Point	Time Step (min.)	Minimum Time Period of Trend	Hard Copy? (Y/N)	ASCII File? (Y/N)	Function Being Tested
Misc. equipment current or status for duty cycling and demand limiting	5	5 days incl. weekend	Y	Y	21-22

Point	Time Step (min.)	Minimum Time Period of Trend	Hard Copy? (Y/N)	ASCII File? (Y/N)	Function Being Tested
Equipment or building kW or current for demand limiting	5	5 days incl. weekend	Y	Y	21-22
Optimum start/stop equip.	5	5 days incl. weekend	Y	Y	24

Remarks:

I. Acceptance Criteria (referenced by function or mode ID)

1. All For the conditions, sequences and modes tested, the BAS, integral components and related equipment respond to changing conditions and parameters appropriately as expected, as specified and according to acceptable operating practice.

J. Sampling Strategy for Identical Units

1. Sample 10% of the field panels for procedure 9, and 10% of the local ports for procedure 12. If 10% fail, test another 10%. If 10% of those fail, test all remaining units at the contractor's expense.

3.04 EXHAUST FANS

A. The testing requirements apply to the following fans (check all that apply): central restroom, mechanical room.

B. Parties Responsible to Execute Functional Test

1. Temperature Controls Contractor: operate the controls to activate the equipment, if BAS controlled.

2. CA: to witness, direct and document testing.

C. Integral Components or Related Equipment Being Tested

	Construction Checklist ID
1. Exhaust fans	PC-_____

D. Prerequisites The applicable prerequisite checklist items listed in the beginning of Section 15997 shall be listed on each functional test form and checked off prior to functional testing. The commissioning agent will also spot-check misc. items and calibrations on the construction checklists previously completed by the installer, before the beginning of functional testing.

E. Functions / Modes Required To Be Tested, Test Methods and Seasonal Test Requirements
The following testing requirements are in addition to and do not replace any testing requirements elsewhere in this Division.

Function / Mode	Test Method Manual, Monitoring, Either or Both[1]	Required Seasonal Test
General 1. Test each sequence in the sequence of operations, and other significant modes and sequences not mentioned; including startup, shutdown, unnoccupied & manual modes and power failure. Test functionality of this piece of equipment or system in all control strategies or interlocks that it is associated with.	Manual	
In addition to, or as part of (1) above, the following modes or tests are required:		
2. Verify schedules and setpoints to be reasonable and appropriate		
3. Function at fire alarm (off, depressurization, etc.)	Manual	
4. Interlocks to building pressurization control	Manual	
5. Speed controls	Either	
6. Check TAB report record of sound power level tests and space pressures and compare to specifications	Review	
7. Sensor calibration checks on any controlling temperature or pressure sensor	Manual	

[1]Refer to Special Procedures

F. Special Procedures (other equipment to test with, etc.; reference to function ID)None

G. Required Monitoring

1. All points listed below which are control system monitored points shall be trended by the Temperature Controls Contractor. Other points shall be monitored by the CA using dataloggers. Refer to the Monitoring section at the beginning of Section 15997 for additional monitoring details.

Point	Time Step (min.)	Minimum Time Period of Trend	Hard Copy? (Y/N)	ASCII File? (Y/N)	Function Being Tested
For each fan:					
Do be determined					

Remarks:

H. Acceptance Criteria (referenced by function or mode ID)

1. 1-6. For the conditions, sequences and modes tested, the fans, integral components and related equipment respond to changing conditions and parameters appropriately as expected, as specified and according to acceptable operating practice.

I. Sampling Strategy for Identical Units of the same type and function, but different in size, are considered identical for sampling purposes.

1. Randomly test at least 10% of each group of identical equipment (the 1st sample). In no case test less than three units in each group. If 10% of the units in the first sample fail the functional performance tests, test another 10% of the group (the 2nd sample). If 10% of the units in the 2nd sample fail, test all remaining units in the whole group, fully at the contractor's expense. This sampling applies to the testing subsections. That is, if calibration is off on more than 10% of the tested piece of equipment, then another sample shall have calibrations checked, but not all other tests need to be done on the second sample.

3.05 INDOOR AIR CLIMATE CONTROL--MISC. SYSTEMS

A. At least 10% of all space zones shall be verified to be maintaining proper climate control. Specific test requirements for this may have been identified elsewhere in this specification (e.g., under terminal units). For all areas not specifically specified, otherwise, the following tests shall be conducted.

B. Parties Responsible to Execute Functional Test

1. Temperature Controls Contractor: operate the controls and provide trend logs

2. CA: to witness, direct and document testing.

C. Integral Components or Related Equipment Being Tested

1. Cooling plant (entire system)
2. Heating plant (entire system)
3. Air, water distribution system
4. Control system

D. Prerequisites All listed systems in Part B, above, shall have had successful functional tests completed prior to this test.

E. Functions / Modes Required To Be Tested, Test Methods and Seasonal Test Requirements
This is a performance test to verify that the HVAC systems can provide and maintain the temperature and relative humidity levels specified, during normal and extreme weather and occupancy conditions. The test consists of monitoring, via trend logs, of various points during the cooling season when temperatures reach to within 5°F of season design (ASHRAE 2 1/2%).

F. Special Procedures (other equipment to test with, etc.; reference to function ID)

1. Building should be normally occupied during the test.

G. Required Monitoring

1. All points listed below which are control system monitored points shall be trended by the Temperature Controls Contractor. Refer to the Monitoring section at the beginning of Section 15997 for additional monitoring details.

Point	Time Step (min.)	Minimum Time Period of Trend	Hard Copy? (Y/N)	ASCII File? (Y/N)	Function Being Tested
Space temperature control:					
Space temperature	5	5 days incl. weekend	Y	Y	1-3
OSAT-DB	5	5 days incl. weekend	Y	Y	1-3

Remarks:

H. Acceptance Criteria (referenced by function or mode ID)

1. Space temperature during occupied modes shall average within +/- 1°F of set point and always remain within 1°F of the ends of the dead band without excessive hunting of either the applicable damper or coil valve, or complaints of drafts or stuffiness from occupants.

I. Sampling Strategy for Identical Units of the same type and function, but different in size, are considered identical for sampling purposes.

1. Randomly test at least 10% of each group of identical equipment (the 1st sample). In no case test less than three units in each group. If 10% of the units in the first sample fail the functional performance tests, test another 10% of the group (the 2nd sample). If 10% of the units in the 2nd sample fail, test all remaining units in the whole group, fully at the contractor's expense. This sampling applies to the testing subsections. That is, if calibration is off on more than 10% of the tested piece of equipment, then another sample shall have calibrations checked, but not all other tests need to be done on the second sample.

3.06 SERVICE HOT WATER SYSTEM

A. Parties Responsible to Execute Functional Test

1. CA: perform and document testing.

B. Integral Components or Related Equipment Being Tested
Construction Checklist ID

1. Hot water heaters (heaters, mixing valves) PC-_____

2. Recirculating pumps PC-_____

C. Prerequisites The applicable prerequisite checklist items listed in the beginning of Section 15997 shall be listed on each functional test form and checked off prior to functional testing. The commissioning agent will also spot-check misc. items and calibrations on the construction checklists previously completed by the installer, before the beginning of functional testing.

D. Functions / Modes Required To Be Tested, Test Methods and Seasonal Test Requirements
The following testing requirements are in addition to and do not replace any testing requirements elsewhere in this Division.

Function / Mode	Test Method Manual, Monitoring, Either or Both	Required Seasonal Test
General 1. Test each sequence in the sequence of operations, and other significant modes and sequences not mentioned; including startup, shutdown, unnoccupied & manual modes and power failure. Test functionality of this piece of equipment or system in all control strategies or interlocks that it is associated with.	Manual	
In addition to, or as part of (1) above, the following modes or tests are required:		
2. Verify schedules and setpoints to be reasonable and appropriate		
3. Unoccupied pump operation	Either	
4. Mixing valve operation and temperature control	Either	
5. Sensor calibration checks on hot water temperature	Manual	

E. Special Procedures (other equipment to test with, etc.; reference to function ID) None

F. Required Monitoring None

G. Acceptance Criteria (referenced by function or mode ID)

1. 1-6. For the conditions, sequences and modes tested, the fan's integral components and related equipment respond to changing conditions and parameters appropriately as expected, as specified and according to acceptable operating practice.

H. Sampling Strategy for Identical Units

1. No sampling. Test all units.

3.07 TERMINAL UNITS

(This applies to standard applications, critical applications will have additional tests and a higher fraction tested.)

A. Parties Responsible to Execute Functional Test

1. Temperature Controls Contractor: operate the controls to activate the equipment.

B. Integral Components or Related Equipment Being Tested

	Construction Checklist ID
1. Terminal unit (TU)	PC-_____

C. Prerequisites The applicable prerequisite checklist items listed in the beginning of Section 15997 shall be listed on each functional test form and checked off prior to functional testing. The commissioning agent will also spot-check misc. items and calibrations on the construction checklists previously completed by the installer, before the beginning of functional testing.

D. Functions / Modes Required To Be Tested, Test Methods and Seasonal Test Requirements
The following testing requirements are in addition to and do not replace any testing requirements elsewhere in this Division.

Function / Mode	Test Method Manual, Monitoring, Either or Both[3]	Required Seasonal Test[1]
General 1. Test each sequence in the sequence of operations, and other significant modes and sequences not mentioned; including startup, warmup, shutdown, unnoccupied & manual modes and power failure and restoration. Test functionality of this piece of equipment or system in all control strategies or interlocks that it is associated with, including all damper, valve and fan functions.	Manual	
In addition to, or as part of (1) above, the following modes or tests are required:		
2. Sensor activator calibration checks on: SAT, MAT, zone air temperature damper position and other random checks (EMS readout against visual or hand-held calibrated instrument must be within 0.5°F for temps. or within a tolerance equal to 10% of static pressure setpoint, with an inclined manometer)	Manual	
3. Device and actuator calibration and stroke checks for heating coil valve and non-DDC dampers	Manual	

Function / Mode	Test Method Manual, Monitoring, Either or Both[3]	Required Seasonal Test[1]
4. For the TU's tested, check the construction checklist items.	Observation	
5. Verify control parameters and setpoints to be reasonable and appropriate by reviewing the full program of 5% of all the TU's with each other for consistency. Verify the max. and min. cfm setpoints of all tested TU's against the control drawing and TAB values. Verify other TU programming parameters such as K-factors, deadbands, setpoints, stroke times, etc.	Observation	
6. Verify no CCV flow when there is HCV flow	Either	
7. Verify no hunting or significant overshoot by damper or valves.	Either	
8. Verify by measurement, CCV & HCV positive shutoff (no leak-thru)	Manual	
9. Verification of minimum OSA control through varying VAV box positions, if applicable	Either	[2]
10. All alarms (fan status, low limits, high static, etc.)	Manual	
11. Verify that TU is maintaining space setpoint temperatures	Monitoring	Both Design
12. Verify airflows and pressures (this random test is part of the TAB test)	--	

NOTES:

[1]Cooling season, Heating season or Both. "Design" means within 5°F of season design (ASHRAE 2 1/2%), or 95% of loading design. A blank cell denotes no special seasonal test is required and that test can be executed during any season, if condition simulation is appropriate.

[2]Seasonal test not required if seasonal conditions can be adequately simulated.

[3]Refer to Special Procedures

E. Special Procedures (other equipment to test with, etc.; reference to function ID) None

F. Required Monitoring

1. All points listed below which are control system monitored points shall be trended by the Temperature Controls Contractor. Other points shall be monitored by the CA using dataloggers. Refer to the Monitoring section at the beginning of Section 15997 for additional monitoring details.

Point	Time Step (min.)	Minimum Time Period of Trend	Hard Copy? (Y/N)	ASCII File? (Y/N)	Function Being Tested
For each zone thermostat and space sensor and other critical areas, monitor:					
Space temperature	10	3 weekdays, summer design	Y	Y	11
Space temperature	10	3 weekdays, winter design	Y	Y	11
Space temperature	2	8 hours, occupied	Y	Y	7
Heating coil valve	2	8 hours, occupied	Y	Y	7
Damper position or cfm	2	8 hours, occupied	Y	Y	7

Remarks:

G. Acceptance Criteria (referenced by function or mode ID)

1. 1-11. For the conditions, sequences and modes tested, the TU, integral components and related equipment respond to varying loads and changing conditions and parameters appropriately as expected, as specified and according to acceptable operating practice.

2. 10. Space temperature during occupied modes shall average within +/- 1°F of setpoint and always remain within 1°F of the ends of the deadband without excessive hunting of either the damper or coil valve, or complaints of drafts or stuffiness from occupants.

H. Sampling Strategy for Identical Units of the same type and function, but different in size, are considered identical for sampling purposes.

1. Testing. Randomly test at least 10% of each group of identical equipment (the 1st sample). In no case test less than three units in each group. If 10% of the units in the first sample fail the functional performance tests, test another 10% of the group (the 2nd sample). If 10% of the units in the 2nd sample fail, test all remaining units in the whole group, fully at the contractor's expense. This sampling applies to the testing subsections. That is, if calibration is off on more than 10% of the tested piece of equipment, then another sample shall have calibrations checked, but not all other tests need to be done on the second sample.

2. Monitoring. Ten percent of the total number of zones in the building, chosen by the Owner, shall be monitored. Within this 10%, shall be included a distribution of all air handlers, zones expected to have the greatest heating and cooling demand, perimeter and core zones and zones identified from the commissioning process that have exhibited potential problems.

3.08 TEST AND BALANCE WORK (TAB)

A. Parties Responsible to Execute Functional Test

1. TAB contractor: perform checks using test instruments.

2. Temperature Controls Contractor: operate the controls to activate the equipment.

3. CA: to witness, direct and document testing.

B. Integral Components or Related Equipment Being Tested

	Construction Checklist ID
1. TAB water-side	PC-_____
2. TAB air-side	PC-_____

C. Prerequisites The applicable prerequisite checklist items listed in the beginning of Section 15997 shall be listed on each functional test form and checked off prior to functional testing. The commissioning agent will also spot-check misc. items and calibrations on the construction checklists previously completed by the installer, before the beginning of functional testing.

D. Purpose. The purpose of this test is to spot check the TAB work to verify that it was done in accordance with the contract documents and acceptable practice and that the TAB report is accurate.

E. The following tests and checks will be conducted. The following testing requirements are in addition to and do not replace any testing requirements elsewhere in this Division.

	Test or Check	Test Method	Required Seasonal Test[3]
	A random sample of up to 25 % the TAB report data shall be selected for verification (air velocity, air or water flow rate, pressure differential, electrical or sound measurement, etc.). The original TAB contractor will execute the checks, witnessed by the commissioning authority. The TAB contractor will use the same test instruments as used in the original TAB work. A failure[1] of more than 10% of the selected items of a given system[2] shall result in the failure of acceptance of the system TAB report and the TAB contractor shall be responsible to rebalance the system, provide a new system TAB report and repeat random verifications of the new TAB report. The testing will include the verification of minimum outdoor air intake flows at minimum, maximum and intermediate total airflow rates for 100% of the air handlers. Other selected data to be verified will be made known upon day of testing.	Demonstration	
2.	Verify that final settings of all valves, splitters, dampers and other adjustment devices have been permanently marked by the TAB Contractor.	Demonstration	
3.	Verification that the air system is being controlled to the lowest possible static pressure while still meeting design loads, less diversity. This shall include a review of TAB methods, control setpoints established by TAB and a physical verification of at least one leg from fan to diffuser having all balancing dampers wide open and that during full cooling of all TUs taking off downstream of the static pressure sensor, the TU on the critical leg has its damper 90% or more open.	Demonstration	
4.	Verification that the water system is being controlled to the lowest possible pressure while still meeting design loads, less diversity. This shall include a review of TAB methods, control setpoints established by TAB and a physical verification of at least one leg from the pump to the coil having all balancing valves wide open and that during full cooling the cooling coil valve of that leg is 90% or more open.	Demonstration	

[1]Failure of an item is defined as follows:
For air flow of supply and return: a deviation of more than 10% of instrument reading

For minimum outside air flow: 20% of instrument reading (30% for reading at intermediate supply flow for inlet vane or VFD OSA compensation system using linear proportional control)

For temperatures: a deviation of more than 1°F

For air and water pressures: a deviation of more than 10% of full scale of test instrument reading

For sound pressures: a deviation of more than 3 decibels. (Variations in background noise must be considered)

[2]Examples of a "system" are: the air distribution system served by one air handler or the hydronic chilled water supply system served by a chiller or the condenser water system. Systems can be defined smaller if inaccuracies in TAB work within the smaller defined system will have little or no impact on connected systems.

[3]Cooling season, Heating season or Both. "Design" means within 5°of season design (ASHRAE 2 1/2%), or 95% of loading design. A blank cell denotes no special seasonal test is required and that test can be executed during any season, if condition simulation is appropriate.

F. Special Procedures (other equipment to test with, etc.; reference to function ID) None

G. Required Monitoring None

H. Acceptance Criteria (referenced by function or mode ID)

1. Provided in footnote to test table above.

I. Sampling Strategy for Identical Units

1. Described in test table above.

END OF SECTION

DIVISION 16 – ELECTRICAL

SECTION 16010 – GENERAL PROVISIONS

PART 1 – GENERAL

1.01 GENERAL

A. Applicable provisions of the Conditions of the Contract shall govern the work of Division 16 and its related sections.

B. Intent:

1. The drawings and specifications are intended to provide for a complete and ready for operation electrical installation. However, both the drawings and specifications are for the Division 16 Contractor's guidance and are not intended to give every detail of the existing conditions or new installations nor do they describe every fitting required for the installation of the work. The Division 16 Contractor shall furnish, install, and place in workmanlike manner all equipment, accessories, supports, fittings, and all other material needed for the complete electrical installation. The Division 16 Contractor shall prepare such additional drawings as necessary or required for any purpose and shall submit them for the approval of the Engineer.

2. Before submitting his proposal, the Division 16 Contractor shall be fully informed to the extent, character, and intent of the work to be done by him. No consideration will be granted for any misunderstanding of the material to be furnished or work to be performed. See also the applicable sections of the Conditions of the Contract.

C. Verifying Existing Conditions:

1. The Division 16 Contractor, before submitting his bid, shall examine the site to which this work is in any way dependent upon according to the intent of these specifications and accompanying drawings. He shall report to the Engineer, in writing, with his bid, any conditions which prevent him from performing his work. No "Waiver of Responsibility" for inadequate, incomplete, or defective work will be considered by the Engineer unless writing notice had been filed by the Division 16 Contractor with his bid.

D. Cooperation:

1. The work called for in this Specification and indicated on the accompanying drawings shall be carried on in conjunction with the continued operation of the building and shall be so arranged that its installation and operation will conform with and facilitate the early installation of the work.

2. The Division 16 Contractor shall bear the expense required to revise his work due to any failure to coordinate the installation of his work with that of the buildings operation.

3. The Division 16 Contractor shall be responsible for the distribution and information concerning his work as required for the prompt installation. The Division 16 Contractor will be held fully responsible for any delay in the work as to any information, etc. regarding his work as required. See also the applicable sections of the Conditions of the Contract.

4. The Division 16 Contractor shall assist the Owner in applying for any available rebates from manufacturer's, utility companies, etc. on equipment or materials installed under the contract. Provide all required documentation and assist in the completion of applications as required to complete the rebate process. All proceeds from rebates remain the property of the Owner.

E. Accessibility and Clearances:

1. The Division 16 Contractor shall inform himself fully regarding peculiarities and limitations of space for the installation the materials and equipment under Division 16. He shall verify all dimensions and conditions in the field and from rough-in drawings of the equipment manufacturer. No extra compensation will be allowed because of differences between actual dimensions and the sizes shown on the drawings.

2. The Division 16 Contractor shall see that all his equipment such as apparatus necessary to be reached from time-to-time for operation and maintenance are made easily accessible. All work shall be checked for interferences with beams, ducts, pipes, etc. prior to installation of any equipment.

3. Although the location of equipment may be shown on the drawings in a specific place, the construction of the building may disclose the fact that the location for this work does not make its position easily and quickly accessible. In such case, the Division 16 Contractor shall call the Engineer's attention to same before installing the work and shall be guided by the Engineer's instruction.

F. Protection of the Work:

1. The Division 16 Contractor shall effectively protect, at his expense, all materials and equipment, including his employees, during the period of construction and he shall be held responsible for all damage done to his work, until the same is fully accepted by the Architect. See also the applicable sections of the Conditions of the Contract.

2. The Division 16 Contractor shall exercise particular care insuring that work in progress, and notably switchgear,

shall not become wet from condensation or water for any source. Further, he shall protect work in progress from contamination, overspray, or other damage from other trades, including his own. All traces of such events shall be removed, remedied, or otherwise corrected to turn over the electrical system to the Owner in new condition.

G. Shop Drawings:

1. For Shop Drawing requirements, see the applicable sections of the Conditions of the Contract. In addition, The Division 16 Contractor shall submit all shop drawings within 30 days of signing Contract. Generally, all equipment and materials of the same classification, type, or kind shall be submitted at one time in a bound brochure. All shall include a minimum of special shop drawings and shall be accomplished by a written detailed sequence of operation together with schematic wiring diagrams which shall show the functions, facilities, operation, and inter-connections of the equipment. Shop drawing submission not including this information will not be considered. Any construction delays caused by failure to submit shop drawings on time or in the proper format shall be the responsibility of the Division 16 Contractor.

2. Engineer/Architect review of contractor submittals and shop drawings is for general conformance with the design concept of the project and for compliance with the information provided in the Contract Documents. The Contractor is responsible for confirming all quantities and fit. Engineer / Architect acceptance of quantities provided in the Contractor's Submission shall not be used as basis of Change Order.

3. Contractor submission of equivalent or substitute items other than those specified is at Contractor convenience only. If a substitution or equivalent is accepted, the Contractor shall coordinate the installation of the substitute or equivalent and make all associated changes required. The Contractor also waives any claim for additional costs associated with the substitute / equivalent which becomes apparent before, during or after installation. The Contractor agrees to bear any and all additional costs to all other contractors or subcontractors which are caused by the incorporation of the substitution / equivalent.

H. Guarantee:

1. For guarantee requirements, see the applicable section of the Conditions of the Contract.

1.02 SPECIAL CONDITIONS

A. This Contractor, as well as subcontractors for his work, must carefully read the "Instructions to Bidder" and study the plans and specifications.

B. It is the intention of these specifications and the drawings accompanying same that they shall provide for the furnishing and installing of the indicated items complete as specified and as shown. Any work on the drawings, particularly described in these specifications, or vice versa, or any work or change which may be evidently necessary to complete the installation shall be furnished by the Contractor as being included in this Contract.

C. During the course of the work, should any ambiguities or discrepancies be found on the drawings or in the specification, to which the Contractor has failed call attention before submission of his bid, than the Engineer shall interpret the intent of the drawings and specifications, and the Contractor hereby agrees to abide by the Engineer's interpretation and agrees to carry out the work in accordance with the decision of the Engineer. It is expressly stipulated that neither the drawings nor the specifications shall take precedence, one over the other, and it is further stipulated that the Engineer may interpret or construe the drawings and specifications of the work, and of that question, the Engineer shall be the sole judge.

D. This Contractor shall provide and erect all sheds for the storage of his materials and provide temporary office for plans, details, records, etc. He shall furnish all scaffolding and equipment required for the installation of his work.

E. Where no specified kind or quality of material is given, a first class standard article as approved by the Engineer shall be furnished. The drawings and specifications do not undertake to illustrate or set every item necessary for the work, as it is assumed that the Contract is expert in the several lines of the work and is capable of interpreting them.

F. Small details not usually shown or specified but necessary for a proper installation and finishing shall be included in the Contractor's estimate, the same as if hereby specified or shown.

G. This Contractor assumes the responsibility to fit his equipment into every space regardless of discrepancies in the plans and/or specifications unless he notified the Engineer in writing, prior to the acceptance of his bid, of these discrepancies.

1.03 WORK INCLUDED

A. These specifications and the accompanying drawings are intended to include the furnishings of all labor, materials, tools, hoists, transportation, equipment apparatus, and all required appurtenances and incidental auxiliaries necessary for the installation of the electrical work in a safe, substantial, workmanlike manner, complete in every detail, tested, programmed and ready for satisfactory operation.

B. Any equipment called for in these specifications and not shown on the drawings and vice versa shall be furnished and installed complete as would any equipment both specified and shown. Generally, the work under Division 16 shall include, but shall not necessarily be limited to, the following items. Omission of specific items shall not be construed as being omitted from Division 16.

1.04 CODES, PERMITS, AND CERTIFICATES

A. All work, material, and equipment under Division 16 shall comply with the current applicable requirements of an approved electrical construction agency serving the locale of the project, the service utility company, all State and Municipal agencies having jurisdiction, UL label equipment requirement, and to the 2017 edition of the National Electrical Code / NFPA 70.

B. Before submitting his bid, the Division 16 Contractor shall familiarize himself with the rules of all herein before mentioned Boards, Departments, Agencies, etc. having jurisdiction, and he shall notify the Engineer with his bid, if in his opinion any work or materials specified is contrary to any such rules. Otherwise, the Division 16 Contractor shall be responsible for the approval of all work or materials and in case the use of any material specified is not permitted, a substitute approved by the authorities and by the Engineer shall be furnished and installed without additional cost to the Owner.

C. The Division 16 Contractor shall procure and pay for all necessary drawings, permits, and certificates required by the various governing agencies having jurisdiction and shall turn over to the Engineer all permits for construction before starting work and certificates of test, inspection, and approval before requesting payment.

1.05 TESTS

A. All tests required by the National Electrical Code, approved Electrical Inspection Agencies, State and Local Authorities, the servicing Utility Company, and the Engineer shall be executed by or paid for by the Division 16 Contractor. Furnish all labor, material, and instruments for each test. All major tests shall be witnessed by the Engineer and/or the Authority having jurisdiction, all of whom shall be given a minimum of one week’s written notice prior to such tests.

B. During the course of work and prior to final acceptance, all such tests shall be made as specified above and as to the Engineer deems necessary to insure that the Electrical Work meets with the intent of these specifications and is approved by the Authority having jurisdiction. Should the tests show that any of the material, apparatus, or workmanship is not first class or not in compliance with these requirements, the Division 16 Contractor, on notice from the Engineer shall remove same and promptly replace them with other materials and apparatus in conformity to the requirements.

C. All circuit work, throughout, on all systems shall be tested for grounds and short circuits, prior to being energized, and all work shall be left in first class operating condition when energized. All other tests shall be as specified above and/or specified elsewhere herein.

D. Tests of electrical work shall be made as equipment is installed.

E. Provide complete functional testing and documentation of installed lighting controls in accordance with NYECC Section C408.3.

1.06 DEMONSTRATION OF THE COMPLETED ELECTRICAL WORK

A. Instruction Demonstration:

1. The Division 16 Contractor shall be fully responsible for the instructing of the Owner's designated personnel in the operation and maintenance of the all equipment furnished by him. All costs required for such instruction and demonstration shall be paid for by the Division 16 Contractor. Such instruction shall take place in the presence of the Engineer's representative, upon completion of the work, when the Division 16 Contractor and his equipment manufacturers and/or vendors shall arrange a demonstration of all electrical systems and equipment for the Owner's design representatives and shall furnish for their use, Engineer approved, printed and bound copies of all operation and maintenance construction manuals. Included in these manuals shall be one (1) copy of all previously submitted and Engineer "Approved" or "Approved as Noted" shop drawings ("Approved as Noted" shop drawings must first be permanently corrected). Informal or non-Engineer witnessed instructions or instructions to non-designed Owner personnel shall not be recognized as fulfilling these requirements.

B. Final:

1. The Division 16 Contractor shall, before payment is received, clean the installed electrical equipment; he shall assure that all guarantees and record drawings, have been prepared and approved; that all instructions have been given and that all demonstrations have taken place.

END OF SECTION

DIVISION 16 – ELECTRICAL

SECTION 16060 - GROUNDING AND BONDING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes grounding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.

1.03 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Data: For the following:

1. Ground rods.

2. Grounding clamps & connectors

C. Qualification Data: For firms and persons specified in "Quality Assurance" Article.

D. Field Test Reports: Submit written test reports to include the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

1.04 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1. Comply with UL 467.

B. Comply with NFPA 70; for overhead-line construction and medium-voltage underground construction, comply with IEEE C2.

C. Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Burndy Corp.
2. Cadweld Div.; Erico Product, Inc.
3. Ideal Industries, Inc.
4. Joslyn Corp.
5. OZ Gediney Div.; General Signal Corp.
6. Thomas and Betts Corp.

2.02 GROUNDING CONDUCTORS

A. For insulated conductors, comply with Division 16 Section "Conductors and Cables."

B. Material: Aluminum, copper-clad aluminum, and copper.

C. Equipment Grounding Conductors: Insulated with green-colored insulation.

D. Grounding Electrode Conductors: Stranded cable.

E. Underground Conductors: Bare, tinned, stranded, unless otherwise indicated.

F. Bare Copper Conductors: Comply with the following:

1. Solid Conductors: ASTM B 3.
2. Assembly of Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.

G. Grounding Bus: Bare, annealed copper bars of rectangular cross section, with insulators.

2.03 CONNECTOR PRODUCTS

A. Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.

B. Bolted Connectors: Bolted-pressure-type connectors, or compression type.

C. Welded Connectors: Exothermic-welded type, in kit form, and selected per manufacturer's written instructions.

2.04 GROUNDING ELECTRODES

A. Ground Rods: Pointed, Copper-clad steel.

1. Size: 3/4 x 120 inches

B. Test Wells: Provide handholes as specified in Division 2 Section "Underground Ducts and Utility Structures."

PART 3 - EXECUTION

3.01 APPLICATION

A. In raceways, use insulated equipment grounding conductors.

B. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections, except those at test wells.

C. Equipment Grounding Conductor Terminations: Use bolted pressure clamps.

D. Ground Rod Clamps at Test Wells: Use bolted pressure clamps with at least two bolts.

E. Underground Grounding Conductors: Use copper conductor, No. 2/0 AWG minimum. Bury at least 24 inches (600 mm) below grade or bury 12 inches (300 mm) above duct bank when installed as part of the duct bank.

3.02 EQUIPMENT GROUNDING CONDUCTORS

A. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.

B. Install equipment grounding conductors in all feeders and circuits.

C. Computer Outlet Circuits: Install insulated equipment grounding conductor in branch-circuit runs from computer-area power panels or power-distribution units.

D. Air-Duct Equipment Circuits: Install an equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners and heaters. Bond conductor to each unit and to air duct.

E. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate equipment grounding conductor to each electric water heater, heat-tracing, and antifrost heating cable. Bond conductor to heater units, piping, connected equipment, and components.

F. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.

1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch (6.4-by-50-by-300-mm) grounding bus.
2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

G. Metal Poles Supporting Outdoor Lighting Fixtures: Provide a grounding electrode in addition to installing a separate equipment grounding conductor with supply branch-circuit conductors.

3.03 INSTALLATION

A. Ground Rods: Install ground rods per NEC and utility requirements.

1. Drive ground rods until tops are 2 inches (50 mm) below finished floor or final grade, unless otherwise indicated.
2. Interconnect ground rods with grounding electrode conductors. Use exothermic welds. Make connections without exposing steel or damaging copper coating.
3. Ground rods shall be installed in undisturbed earth.

B. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

C. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.

D. Metal Water Service Pipe: Provide insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes by grounding clamp connectors. Where a dielectric main water fitting is installed, connect grounding conductor to street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

E. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with grounding clamp connectors.

F. Bond interior metal piping systems and metal air ducts to equipment grounding conductors of associated pumps, fans, blowers, electric heaters, and air cleaners. Use braided-type bonding straps.

G. Bond each aboveground portion of gas piping system upstream from equipment shutoff valve.

H. Install one test well for each service at the ground rod electrically closest to the service entrance. Set top of well flush with finished grade or floor.

3.04 CONNECTIONS

A. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

B. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.

C. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.

D. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.

E. Connections at Test Wells: Use compression-type connectors on conductors and make bolted- and clamped-type connections between conductors and ground rods.

F. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

G. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

3.05 GRADING AND PLANTING

A. Restore surface features, including vegetation, at areas disturbed by Work of this Section. Reestablish original grades, unless otherwise indicated. If sod has been removed, replace it as soon as possible after backfilling is completed. Restore areas disturbed by trenching, storing of dirt, cable laying, and other activities to their original condition. Include application of topsoil, fertilizer, lime, seed, sod, sprig, and mulch. Comply with Division 2 Section "Landscaping." Maintain restored surfaces. Restore disturbed paving as indicated.

END OF SECTION

DIVISION 16 – ELECTRICAL

SECTION 16100 – BASIC MATERIALS AND METHODS

PART 1 – GENERAL

1.01 GENERAL

A. Standards for Materials and Workmanship:

1. All materials and workmanship shall, at a minimum be in accordance with (in no order of precedence):
   a. National Electric Code (NPFA 70) – latest edition as adopted by the Authority Having Jurisdiction, unless otherwise noted.
   b. State and municipal Building Codes and related subcodes.
   c. Occupational and Safety Act (OSHA) Requirements.
   d. Rules and Regulations of the Authority Having Jurisdiction applicable to the work.
   e. National Electrical Standards Association Standard for Good Workmanship in Electrical Construction (NECA-1)
   f. Serving utility's rules and regulations for providing service.
   g. Contract Drawings and Specifications.
   h. Manufacturer recommended installation instructions, practices and procedures for the products being utilized or installed.

   Where conflicts arise between the above, the more stringent requirement shall be adhered to.

2. Except where existing materials and equipment are called for to be reused, all materials and equipment furnished and installed under Division 16 shall be new, of standard first grade quality, and correctly designed for their specific purpose. All new materials and equipment shall conform to the standards of and be listed/labeled by a Nationally Recognized Testing Laboratory (NRTL) such as Underwriters Laboratories (UL) and shall be approved for use by all local authorities having jurisdiction.

3. All equipment and material furnished shall be the manufacturer's standard item of production unless specifically specified or required to be modified to suit job conditions. Size material; finish dimensions, and the capacities for the specified application shall be published in catalogs for national distribution by the manufacturer. Ratings and capacities shall be certified by a recognized American rating bureau.

4. Equipment and material fabricated specifically for use on this project shall be in strict accordance with the Drawings and Specifications and shall conform to the latest

standards of the National Electric Manufacturer's Association.

5. All materials and equipment of one and the same kind, type, or classification and used for identical purpose shall be made by the same manufacturer.

6. All equipment and materials to be installed under Division 16 shall be done so in a workmanlike manner in accordance with recognized workmanship standards and shall present a neat and professional appearance when completed. Any workmanship considered by the Engineer as being faulty or as not being first class shall be removed and replaced by the Division 16 Contractor to the satisfaction of the Engineer at no additional cost to this Owner.

7. Within 30 days of Contract signing and prior to the submission of shop drawings or the purchase of any material or equipment, the Division 16 Contractor shall submit to the Engineer a detailed list of all items of materials and equipment, which he proposes to furnish under Division 16. Such a list shall bear the equipment manufacturer's name, general description or series catalog number, and intended location or use of same. In addition, furnish a list of distributors who will be providing equipment for this project.

8. Where particular products or materials are specified hereinafter by manufacturer's name, they shall be considered as the standard and as most satisfactory for their purpose of use on the site or in the building. Another manufacturer's product other than those indicated may be submitted for substitution with the understanding that the Engineer shall be the sole judge as to the acceptability of the substituted items. In addition, furnish to the Engineer or Owner upon request, and within 14 days of such a request, samples of any Base Bid and/or corresponding Alternate Bid or intended substitute equipment, fixtures, etc. for their comparison and selection.

1.02 CUTTING AND PATCHING AND REPAIR

A. General

1. The Division 16 Contractor shall be responsible for the removal and replacement of existing ceiling, wall and flooring systems as required to perform the work, unless otherwise noted. Prior to disturbing the area, notify the Owner of any pre-existing damaged, stained, degraded finish materials or areas, such that pre-existing conditions can be documented and for Owner option to provide replacements for re-installation.

2. When applicable to project conditions, removal of existing hung ceilings shall be done with care and stored in a

controlled location for future reinstallation under this Contract. Any ceiling tile damaged as a result of this work shall be replaced by the Division 16 Contractor (at no additional cost to the Owner).

3. All cutting required to facilitate the proper installation of all work to be installed under Division 16 shall be done by the Division 16 Contractor. All cutting shall be done in the manner specified and/or directed and approved by the engineer and only after permission of the Engineer is obtained. The installation of sleeves, chases, etc. in concrete walls, floors, ceilings, and roofs as well as the cutting of existing concrete walls, floors, ceilings, and roofs shall be done by core drilling. All patching will be the responsibility of this Contractor.

4. Any penetrations through fire rated areas shall be accomplished using 3M or Hilti fire barrier products in sheets, strips, or caulk (i.e., USG Fire Stop System (that meets ASTM, UL, and FM standards.

5. Where the Division 16 Contractor's demolition, relocation or replacement activities result in bare areas remaining exposed, the Division 16 Contractor shall be responsible to patch, prime and paint, or otherwise repair the exposed areas as required to match the adjacent areas. Remove unused anchors and fasteners and patch appropriately. Prime and paint as required to match the adjacent area.

6. All costs for the above shall be included in bid price.

1.03 WATERPROOFING

A. Wherever any of the work of Division 16 has to pierce any waterproofing, this work shall be done by the Division 16 Contractor with care and after the part of these systems have been put in place through this waterproofing, the opening made by same shall be waterproofed and made absolutely water-tight as approved by the Architect and/or as hereinafter specified.

B. Conduits piercing the cement waterproofing of wall sand floors shall be provided with waterproof conduit entrance seal sleeves around same. These sleeves shall be Type "WSK" (walls) or "FSK" (floors) as manufactured by O-Z or other approved.

C. Conduit sleeves through non-waterproofed walls and floors shall be grouted, caulked with oakum, and sealed with approved semi-plastic mastic compound on both sides of the wall.

1.04 CONDUIT, RIGID AND FLEXIBLE

A. All conduits installed on the site or in the building shall be of the highest quality, free from defects, and listed by a NRTL and bear the manufacturer's mark or stamp. The Division 16 Contractor shall check the details of other Division and also the various Vendors' and Manufacturers' approved layouts for the exact

locations of all equipment, motors, etc. and shall terminate his conduit turns as shown thereon and as directed.

1. Thin Wall Steel Electrical Metallic Tubing, EMT (galvanized inside and outside).

   a. All areas where conduit is concealed in walls or hung ceilings and allowed by Code.

   b. All areas where conduit is exposed on walls or ceilings and allowed by Code. (Except otherwise noted on drawings).

2. Flexible Metal Clad Cable, MC (galvanized steel inside and outside).

   a. Run concealed in ceiling and non-masonry partitions as indicated by the special symbol and for the particular wiring systems indicated on the drawings. Provide conduit sleeves or junction box conversion to pipe and wire for extension of these runs from ceilings into masonry partitions for switch legs and similar case. In no case shall MC be permitted for wiring sizes larger than No. 10 AWG or quantities greater than four (4) conductors in a single armored cable, furnish and install a flexible steel conduit (Greenfield) with the required number of conductors for that particular armored cable run in order to comply with the requirements for this paragraph and NEC Codes.

   b. **Use of aluminum clad MC Cable is disallowed.**

B. The Drawings indicate the general location of conduit runs which may be modified at the time of installation to adapt same to building construction or site configuration but in no case shall circuits be combined without permission from the Engineer. Minimum size conduit for rigid steel, thin wall steel, flexible steel, or rigid **non-metallic conduit shall be ¾-inch** unless indicated otherwise on the Drawings. All rigid steel, thin wall steel, and rigid non-metallic conduit corners shall be turned with standard elbows or long radius bends. For all sizes of conduit larger than one inch, use standard manufactured elbows and offsets made for this purpose. For one inch and smaller sizes, the Division 16 Contractor will be permitted to make bends, but care must be taken not to damage the conduit. The radius of the inner curve on any bend shall be not less than allowed by Code. No more than four (4) right angle bends shall be permitted in any conduit run between any two (2) terminations or pull boxes.

C. The ends of all conduits shall be carefully reamed before installation and after the application of the dies and shall be free from burrs and sharp edges. Where it becomes necessary to cute a length of conduit, it shall be done with a hacksaw or other approved cutter and care shall be taken to secure a straight end on all conduits so that all conduit joints can and

will be brought to a shoulder. In installing all conduits, particular care must be taken in cutting to the proper length so that the ends will fit exactly into the outlet boxes and cabinets. Where conduits terminate in cabinets, they shall be neatly arranged. The ends of all conduits shall be immediately temporarily plugged after installation with plugs similar to T & B Series 1471, size as required, so as to avoid the conduit filling with earth, mortar, dust, etc.

D. All conduits shall be furnished complete with all required size associated or elsewhere herein under Grounding. Joints in rigid steel conduit shall be made with threaded type steel coupling made up with Thomas and Betts Krop-Shield compound. Terminations of rigid steel conduit shall be made with double steel locknuts and insulated galvanized steel grounding type bushing, Thomas & Betts Series 3800 or other approved made with the threading compound specified above where required. Running threads on rigid conduit shall not be permitted; therefore, where straight threads cannot be used, approved type unions shall be installed. Joints in thin wall steel conduit shall be made with steel compression type couplings and connectors. Terminations of thin wall steel conduit shall be made with a single steel locknut, a compressions type steel connector and an insulated galvanized steel grounding type bushing, Thomas & Betts Series 5100 and Series 3800 or other approved. All fittings for flexible steel conduits and flexible armored cables shall be of the standard steel set screw and single locknut type or of the steel double locknut ‘0’ ring type and shall be approved for grounding purposes by the Local Inspector. Fittings for rigid non-metallic conduit shall be of non-metallic thread type and/or of the non-metallic solvent weld type. Where required, provide cast or installed above grade or within building(s). The ends of conduits terminating at motors, starters, and similar apparatus and devices shall be furnished with fittings as specified above and suitably required in each case. Provide expansion fittings on all conduits passing through or crossing building expansion joints. Expansion fittings for steel, conduits shall be OZ Catalog No. “DX (rigid) and TX (thin wall) or other approved. Expansion fittings for non-metallic conduits shall be of the ‘O’ ring non-metallic expansion coupling type as manufactured by Carlon or other approved. Care shall be taken to secure a straight end on all conduits so that all conduit joints can and will be brought to a shoulder. In installing all conduits, proper care must be taken in cutting to the proper length so that the ends will fit exactly into the outlet boxes and cabinets. Where conduits terminate in cabinets, they shall be neatly arranged. The ends of all conduits shall be immediately temporarily plugged after installation with plugs similar to T & B Series 1471, size as required, so as to avoid the conduit filling with earth, mortar, dust, etc.

E. All conduits shall be furnished complete with all required size and associated fittings. Joints in rigid steel conduit shall be made with threaded type steel coupling made up with Thomas & Betts Krop-Shield compound. Terminations of rigid steel conduit shall be made with double steel locknuts and insulated galvanized steel ground type bushing, Thomas & Betts Series 3800 or

otherwise approved made up with the threading compound specified above where required. Running threads on rigid conduit will not be permitted; therefore, where straight threads cannot be used, approved type unions shall be made with steel compression type couplings and connectors. Terminations of thin wall steel conduit shall be made with a single steel locknut, a compression type steel connector and an insulated galvanized steel grounding type bushing, Thomas & Betts Series 5100 and Series 3800 or other approved. All fittings for flexible steel conduits and flexible armored cables shall be of standard steel set screw and single locknut type or of the steel double locknut 'O' ring type and shall be approved for grounding purposes by the Local Inspector. Fittings for rigid non-metallic conduit shall be of the non-metallic thread type and/or of the non-metallic solvent weld type. Where, required, provide cast non-metallic support fittings for all rigid non-metallic conduits installed above grade or within building. The ends of the conduits terminating at motor, starters, and similar apparatus and devices shall be furnished with fittings as specified above and as suitably required in each case. Provide expansion fittings on all conduits passing through or crossing building expansion joints. Expansion fittings for steel, conduit shall be OZ Catalog No. "DX" (rigid) and "TX" (thin wall) or other approved. Expansion fittings for non-metallic conduits shall be of the 'O' ring non-metallic expansion coupling type as manufactured by Carlon or other approved.

F. The conduits for all branch circuit and feeder wiring shall be run concealed except in machine rooms, boiler rooms, equipment rooms, and similar space; where indicated or specified otherwise; where the lack of a hung ceiling and the presence of mechanical equipment and ducts makes a concealed installation from the slab impossible or impractical; where permission is granted by the Engineer to run exposed. Exposed conduits shall run parallel to walls and ceilings using hot dipped galvanized conduits, fittings, or pull boxes for taps and direction changes. All exposed conduits must be securely fastened in place by means of substantial galvanized supports and fasteners. Where conduits are to be fastened to masonry walls, ceilings, or partitions, the use of wooden plugs will not be permitted; provide malleable iron pipe clips with screws and expansion sleeves. Banks of conduits shall be supported from Unistrut trapeze hangers fastened to structural member by rods. The arrangement and method of fastening all conduits shall be subject to the direction and approval of the Architect and shall be supported free from outlets, pull boxes, etc. No "Hit On" clamps or squeeze connections shall be accepted. All fittings shall be nut and bolt connected.

1.05 WIRE AND CABLE

A. Furnish and install all wire and cable for receptacles, equipment, panels, etc. for a complete wiring system as indicated on the Drawings and as required and specified.

B. All wire and cable shall be new, manufactured of soft drawn copper of not less than 98% conductivity, conforming to ASTM

specifications and the latest requirements of N.E.C. Wire, and cable shall have 600 volt insulation (unless otherwise noted or specified) of the type specified and shall be of the standard AWG sizes as called for on drawings or specified. All wire and cable shall be delivered to the site or the building(s) in their original unbroken packages or reels plainly marked or tagged as follows:

1. Underwriters' labels and words "National Electrical Code Standard."

2. Size, code type, insulation, and maximum working voltage of the wire.

3. Name of manufacturing company and the trade name of the wire.

4. Date of manufacture (month and year) which shall be within eight (8) months of installation.

C. 600 volt class wire and cable shall be as manufactured by American Insulated Wire, Triangle, General Cable, or Anaconda. High voltage cables, 5,000 volts and above shall be as specified by the local electric utility and as may be further specified by the engineer when such specification section is included in this project manual.

D. Wire and cable insulation shall be as follows and, in all cases, the insulation shall be suitable for the operating temperature of the equipment served.

1. No. 12 AWG and larger, dry locations: **THHN**.

2. No. 12 AWG and larger, wet location in conduit direct bury or in conduit in concrete slabs on earth: **THHW**.

3. For service conductors serving local utility equipment and all service related CT cabinet, disconnectors and or main distribution center: **XHHW** or **USE**.

4. For continuous runs in fluorescent fixtures listed as a raceway or installed in non-plenum spaces: **RHH**, or **THHN**.

5. For recessed outdoor lighting fixtures: **XHHW** (to junction box in hung ceiling).

6. For recessed indoor lighting fixtures: **AF** or **THHN** (to junction box in hung ceiling).

7. Areas of high ambient temperature (i.e., boiler rooms, auxiliary heater rooms, etc.): **RHH**.

8. Within 3 feet of boilers, heater, etc.: **AVA**.

9. Special systems (fire alarm, sound, etc.): Size and insulation as specified and/or indicated on the Drawings for each special system. All such wiring shall be plenum rated.

10. Pendants and flexible cords: SJ or SJO (both with ground wire).

11. Other wire and cables: All other wire and cable shall be as indicated on the Drawings or as required by the particular equipment manufacturer or Utility Company.

E. Unless otherwise noted or indicated all light and power wiring shall be #12 AWG size: light and power wiring home runs shall be #10 AWG if longer than 100 feet measured between the local switch and the panelboard or the nearest outlet and the Panelboard. All cable #8 AWG and larger shall be stranded: all wire #10 AWG and smaller shall be solid.

F. All wire and cable #6 AWG and small shall be factory color coded. Cables #4 AWG and larger shall be field color coded utilizing colored pressure sensitive tape at switchboards, panelboards, pullboxes, junction boxes, outlet boxes, and equipment served. Colors for each phase and neutral shall be consistent throughout the system. Where two or more neutrals are run in any one conduit, each neutral shall be taped to associated line conductors in each outlet. Neutrals and/or ground may not be combined and shall be installed continuous to panelboards, switchboard, etc. Each circuit on the drawings has been given a reference number. Connections at Panelboard, distribution equipment, etc., shall be that no neutral wire or cable shall serve more than one branch circuit wire or cable from the same phase. Color code, where not otherwise required by the inspection authorities, shall be as follows (where multiple circuits are run in a single conduit, additional color sequence shall be provided as approved):

	120/208V	277/480v
Phase A	Blue	Brown
Phase B	Black	Orange
Phase C	Red	Yellow
Neutral	White	White or Gray
Traveler or Switch Leg	Black with red colored stripe	Black with red colored stripe
Ground	Green	Green

G. All polyphase installations shall be phase rotation checked before and after work conduct to assure connect rotation or maintenance of existing rotation, as suitable. Verify correct phase rotation prior to activating any 3-phase device.

1.06 WIRE AND CABLE CONNECTIONS AND DEVICES

A. Feeder circuit cables shall be continuous from distribution equipment, etc. to panel, etc. served. Splicing and intermediate

pull boxes and manholes will not be permitted without the written permission of the Engineer. Branch circuit wiring shall be continuous except splices will be permitted at outlets, junction boxes, etc. six hundred volt, solderless mechanical splicing devices, as hereinafter specified, shall be used for splicing joints, taps, and connections of 600 volt wire and cables used for feeder and branch circuit wiring. The same devices shall be used for splicing joints, taps, and connections of sound, fire alarm, and other special system wire and cables except at terminal strip cabinets, sound racks, etc. where such connections shall be made with the terminal strips specified with the strip cabinets, etc. Wire nuts or crimp-on connectors shall not be permitted for splicing. Sufficient slack wire and cable shall be left for all outlets, distribution equipment, panelboards, controllers, amplifiers, control panels, etc. to facilitate connections to device or equipment served without putting a strain on the wire or cable. For wire #8 AWG and smaller, use steel spring solderless connectors with semi-rigid insulating shell taped with vinyl Scotch #88 tape (Scotch brand "Scotchlok" Types "Y", "R", and "B" as required or other approved). For cable #6 AWG and larger, use heavy duty Hy-press Barrel crimping tubes, (Thomas & Betts, Burndy, O.Z., or other approved). All connections shall be insulated with 3m type cold shrinks or other approved heat shrinks. The method used must provide insulation equivalent to 150% of the conductor's insulation. Other devices used for splicing other special wires and cables shall not be as specified elsewhere herein. **Use of split bolt connectors (bug nuts) is disallowed**.

B. All wires and cables within all panelboards, distribution equipment control panels, terminal strip cabinets, pullboxes, junction boxes, outlets, and other equipment shall be neatly laced and bound in an orderly, workmanlike manner with Thomas & Betts Ty-rap and identified using Thomas & Betts E2 code self-laminating type Series WSL vinyl wire markers.

C. No wires or cables shall be installed in conduits until conduits are free from condensate, moisture, and/or water. The only permissible wire pulling lubricant is Ideal Industries "Yellow 77."

D. All circuits, regardless of being in conduit of any type, shall contain a bond wire. Use of (metallic) conduit as a bond is disallowed.

1.07 OUTLET BOXES

A. Furnish and install an outlet box for each and every outlet, device fixture, etc. called for on the drawings, specified and required by Code. Outlet boxes shall be approved design, construction, form and dimension suitable for its specific location, the kind of wiring device, fixture, etc. to be used, the number of wires contained, and the arrangement type conduit and/or raceway they are connected to.

B. Unless noted otherwise, hereinafter **all** outlet boxes shall be galvanized or sherardized pressed steel boxes. Outlet boxes for surface raceways shall be galvanized steel prime painted boxes

and shall be compatible with the size and type surface raceway used.

C. All outlet boxes shall be a minimum of 4" square or round by 1 ½" deep unless indicated otherwise on the drawings and unless a local condition requires a small box (metal and glass partition work, etc.). Use deeper boxes where required by the number of wires, splices, bushings, special fixture, wiring devices, and as specified hereinbefore.

D. Pressed steel boxes and accessories shall be as manufactured by Thomas & Betts, Steel City, or National Electric. Outlet boxes and accessories for surface raceways shall be as manufactured by Panduit, Wiremold, National Electric, Hubble, or other approved.

1.08 PULL AND JUNCTION BOXES

A. Furnish and install all pull boxes and junction boxes in the various electrical conduit systems where specified, where indicated on the drawings, and wherever required to facilitate the proper installation of the wires and cables.

B. Junction boxes shall meet all the requirements of and be installed in a manner identical to that specified elsewhere herein for outlet boxes except: 1) that with the exception of junction boxes used for surface raceways, generally all junction boxes shall be installed only in unfinished areas or behind lay-in ceilings where they shall be accessible (whether junction boxes are installed in finished areas or unfinished areas they shall be flush mounted in masonry or non-masonry walls except in machine rooms, equipment rooms, and boiler masonry walls where they may be surface mounted cast boxes or non-metallic boxes as specified for outlet boxes); 2) that minimum size pressed steel junction box shall not be less than 4 11/16" square by 2 1/8" deep. 3) and that all pressed steel junction boxes shall be provided with blank aluminum cover plates having an anodized finish similar to those specified under Wiring Devices (except pressed steel boxes above hung ceilings which shall be provided with flat galvanized or sherardized steel plates). Special junction boxes shall be in accordance with these specifications and as specified elsewhere herein or on the drawings.

C. Pullboxes shall be constructed of standard type and size code gauge boxes and covers and shall be employed where practical unless specified otherwise. Pullboxes other than standard (for both steel and non-metallic conduit systems) shall be constructed of not less than 12 gauge galvanized sheet steel with suitable angle iron reinforcing frame. Access for surface mounted pullboxes (standard and non-standard) shall be provided by means of removable screw-on covers and sides. Flush type pullboxes shall always be of the non-standard type and shall have single door with trim and lock as specified elsewhere herein for panelboards. Pull boxes shall be sized as indicated on the drawings and/or in accordance with the N.E.C. and shall be phosphate treated and finished as specified elsewhere herein for panelboards. Other pull boxes shall be in accordance with these specifications and as specified elsewhere herein or on the

drawings. Pull boxes shall be as manufactured by Empire, Lexington, Standard, or other approved.

1.09 WIRING DEVICES

A. Unless noted otherwise elsewhere, herein, or on the drawings, the Division 16 Contractor shall furnish and install all wiring devices. Wiring devices furnished by the Division 16 Contractor shall be as manufactured by Hubbell, Leviton, or Arrow Hart, unless noted otherwise, and shall be of the specification grade and type indicated hereinafter or on the drawings and in compliance with the following specifications:

1. Switches: (Unless otherwise noted on drawings and specifications)

   Switches: Hubbell 1221-I
   Key Switches: Hubbell 1221L and Key

   Switches shall be located at the strike side of doors as finally hung, whether indicated on the drawings or not. All three-way and four-way switches shall have ivory toggles unless otherwise noted on drawings.

2. Standard Receptacles: (Unless otherwise noted on drawings or specifications, provide tamper resistant receptacles as follows):

   Duplex Receptacle 20A-125V: Hubbell HBL 5362TR
   Ground Fault Interrupter 20A-125V: Hubbell GF 5362TR

3. Key Switches:

   Check with building custodian and install keyed units where indicated. Provide a key for each switch and receive a signed receipt for records.

B. All other incidental wiring devices shall be of the same make and quality of those as specified herein.

C. Furnish and install cover plates fro each switch, receptacle, and other wiring devices being installed unless noted otherwise. Several wiring devices located at the same location shall be installed in ganged type boxes as specified under outlet boxes, and such devices shall be provided with multi-gang cover plates of the types specified hereinafter. All cover plates shall be stainless steel “302” plates and shall have a brushed finish as selected by the Engineer for each particular room or area. Plates shall be .04 thick, of same manufacture and device.

1.10 PANELBOARDS

A. Furnish and install lighting equipment and power panelboards as indicated on the floor plan and in the schedule on the drawing. Panelboards shall be suitable for 120/208 volts, 3 phase, 4 wire service or 277/480 volts, 3 phase, 4 wire or as may otherwise be specified.

B. The panelboards shall be of the dead front type mounted in a 12 gauge (minimum) galvanized sheet steel cabinet or enclosure suitable for surface mounting as shown on the drawing. Enclosure shall be equipped with sheet steel trims having hinged doors. Trim shall be provided with angle supports, which engage the flange of the cabinet and shall be fastened to the cabinet by means of approved clamps. The use of screws engaging holes in the flange of the cabinet for fastening trim will not be acceptable. Door shall have concealed hinges and paracentric cylinder lock. Panel shall be finish painted with baked-on gray enamel. On the inside of the panelboard, provide a typewritten numerical directory, in a metal frame having a transparent plastic face. Directory shall indicate service controlled by each circuit, voltage service to panel, and feeder size serving panel.

C. Ample gutter space shall be provided in accordance with the National Electric Code and these specifications, with minimum gutter space of six inches.

D. Minimum width of panel including gutter space shall be 20 inches. All lugs for incoming and outgoing terminals shall be of the solderless type. Feeder lugs shall be single or multiple types as required. Where cable lug connections are made directly to the bus bars, they shall be made via cast type lugs manufactured of the proper metal alloys so as not to cause a galvanic reaction when connecting the copper cables to the aluminum bus bars.

E. Panelboards shall be of the bolt on circuit breaker type. Circuit breakers shall be molded case type and shall be of the individual unit construction complete with quick-make, quick-break mechanism; thermal magnetic trip; ambient compensation and shall be interchangeable in the panelboard assembly in ratings from 15 through to 100 amperes on 120/208 volt panels without necessitating bus, line, or assembly rearrangements. All circuit breakers shall have suitable bolt type line terminals so that they can be held in positive contact with their respective links or bus. **Plug-in breakers shall not be acceptable**. All single pole breakers in panel shall be so arranged and connected to the main bus that any three adjacent breakers are connected to Phase A, B, and C respectively and that same relationship of phase sequence is maintained. All branch circuit breakers shall have the number of poles and circuits as indicated on the drawing and shall be as specified hereinafter. Connect all circuits on all panels so as to balance the load as much as possible on all phases.

F. Panelboards shall be as specified herein. Provide ten (10) circuit breaker handle lock dogs for Custodian’s use (per panel).

G. All busing shall be of high conductivity silver-plated solid copper. Bus bar carrying capacity shall be at least equal to the capacity of the protective device on the panel feeder. Where feeders are oversized in capacity to compensate for feeder length, the panel shall be equipped with lugs equal to the oversize feeder conductors. Alternately, the feeder may be spliced with compression indent splices to transition from the oversize conductor to the normal size conductor (that matches the

panel bus) in a splice box external to the panel. This technique may also be employed at the originating protective devices. **Shaving of conductors to fit lugs is specifically disallowed**.

H. Panelboards shall be as specified and/or similar to Eaton, Siemans, or G.E. in compliance with these specifications.

I. Where a flush mounted panel is being provided, the Division 16 Contractor shall check the depth of block walls containing same and shall have the panel fabricated to suit space available.

J. Provide door-in-door panelboard cover unless otherwise specified.

K. New circuit breakers installed in existing panelboards shall listed for, and shall match the interrupting rating of the intended panel.

END OF SECTION

DIVISION 16 – ELECTRICAL

SECTION 16502 - LED INTERIOR LIGHTING

PART 1 - GENERAL

1.01 SUMMARY

A. Provide lighting fixtures complete with all lamps as specified on the Electrical and Architectural, Drawings. Provide all supports, brackets, connectors, materials, tools, wiring, controls and labor to provide a complete and operating lighting system.

B. All blemished, damaged or unsatisfactory fixtures shall be replaced in a satisfactory manner as directed by the Architect.

C. Where a fixture type designated has been omitted, cannot be determined or conflicts with other Drawings or Specifications, request a clarification from the Architect, prior to bid, and provide suitable fixture type as directed.

D. All lamps shall be operating at project completion and for a period of six (6) months after the final acceptance by the Owner.

E. Confirm exact locations of lighting fixtures with the Architectural Reflected Ceiling Plan and mechanical equipment above or on the ceiling.

F. All recessed lighting fixtures shall match the ceiling type and be tested and certified by the fixture manufacturer for the type of mounting.

1.02 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color Rendering Index.

C. Fixture: See "Luminaire."

D. IP: International Protection or Ingress Protection Rating.

E. LED: Light-emitting diode.

F. Lumen: Measured output of lamp and luminaire, or both.

G. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.03 SUBMITTALS

A. Product Data: For each type of product.

1. Arrange in order of luminaire designation.
2. Include data on features, accessories, and finishes.
3. Include physical description and dimensions of luminaires.
4. Include emergency lighting units, including batteries and chargers.
5. Include life, output (lumens, CCT, and CRI), and energy efficiency data.
6. Photometric data and adjustment factors based on laboratory tests, complying with IES Lighting Measurements Testing and Calculation Guides, of each luminaire type. The adjustment factors shall be for lamps and accessories identical to those indicated for the luminaire as applied in this Project IES LM-79 and IES LM-80.

B. Shop Drawings: For nonstandard or custom luminaires.

1. Include plans, elevations, sections, and mounting and attachment details.
2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

C. Product Schedule: For luminaires and lamps. Use same designations indicated on Drawings.

1.04 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Luminaire manufacturer's laboratory that is accredited under the NVLAP for Energy Efficient Lighting Products.

B. Provide luminaires from a single manufacturer for each luminaire type.

C. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

1.06 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.

PART 2 - PRODUCTS

2.01 PRODUCTS

A. Refer to the Lighting Fixture Schedule on the drawings for the specified fixtures and options.

2.02 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Standards:

1. ENERGY STAR certified.
2. California Title 24 compliant.
3. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.
4. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.
5. UL Listing: Listed for damp location.
6. Recessed luminaires shall comply with NEMA LE 4.

C. CRI as indicated on the drawings. CCT as indicated on the drawings.

D. Rated lamp life of minimum 50,000 hours to L70.

E. Lamps dimmable from 100 percent to 0 percent of maximum light output.

F. Internal driver.

2.03 MATERIALS

A. Metal Parts:

1. Free of burrs and sharp corners and edges.
2. Sheet metal components shall be steel unless otherwise indicated.
3. Form and support to prevent warping and sagging.

B. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

C. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Locate labels where they will be readily visible to service

personnel, but not seen from normal viewing angles when lamps are in place.

1. Label shall include the following lamp characteristics:

   a. "USE ONLY" and include specific lamp type.
   b. Lamp diameter, shape, size, wattage, and coating.
   c. CCT and CRI for all luminaires.

2.04 METAL FINISHES

A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

2.05 EMERGENCY EGRESS LIGHTING

A. Lighting fixtures indicated on the drawings to be provided with an emergency battery shall provide emergency lighting

B. The battery pack shall consist of a field replaceable high temperature, maintenance free nickel cadmium battery, charger and electronic circuitry contained in one metal case.

C. Provide a solid state charging indicator light to monitor the charger and battery, double pole test switch and installation hardware. The battery pack shall provide power to the luminaire upon failure of the normal supply.

D. Provide test button and indicator light.

E. Under normal mode the battery pack shall maintain the batteries at full charge.

F. Battery recharge time shall not exceed 16 hours to fully recharge and shall not exceed 225 milliamperes charging current.

G. The battery pack shall meet or exceed all the requirements set forth in UL924 “Emergency Lighting and Power Equipment” and shall be UL listed for installation on top of or remote from the fixture. Emergency illumination shall meet or exceed the requirements set forth in the National Electric Code, Life Safety Code and UL 90-Minute Requirements.

2.06 EXIT SIGNS

A. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.

B. LED lamps: 50,000 hours minimum rated lamp life.

C. Integral battery to illuminate sign for a minimum of 90 minutes upon loss of normal power.

2.07 LUMINAIRE SUPPORT

A. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire.

B. Wires: ASTM A 641/A 641 M, Class 3, soft temper, zinc-coated steel, 12 gauge.

C. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.

D. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before luminaire installation. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 TEMPORARY LIGHTING

A. If approved by the Owner, use selected permanent luminaires for temporary lighting. When construction is sufficiently complete, clean luminaires used for temporary lighting and install new lamps.

3.03 INSTALLATION

A. Comply with NECA 1.

B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.

C. Install lamps in each luminaire.

D. Supports:

1. Sized and rated for luminaire weight.
2. Able to maintain luminaire position after cleaning and relamping.
3. Provide support for luminaire without causing deflection of ceiling or wall.

4. Luminaire mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and vertical force of 400 percent of luminaire weight.

E. Flush-Mounted Luminaire Support:

1. Secured to outlet box.
2. Attached to ceiling structural members at four points equally spaced around circumference of luminaire.
3. Trim ring flush with finished surface.

F. Wall-Mounted Luminaire Support:

1. Attached to structural members in walls or Attached to a minimum 20 gauge backing plate attached to wall structural members.
2. Do not attach luminaires directly to gypsum board.

G. Ceiling-Mounted Luminaire Support:

1. Ceiling mount with minimum two 5/32-inch- diameter aircraft cable supports adjustable to 120 inches in length.
2. Pendant mount with 5/32-inch- diameter aircraft cable supports adjustable to 120 inches in length.
3. Ceiling mount with hook mount.

H. Suspended Luminaire Support:

1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
2. Stem-Mounted, Single-Unit Luminaires: Suspend with twin-stem hangers. Support with approved outlet box and accessories that hold stem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.
3. Continuous Rows of Luminaires: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of luminaire chassis, including one at each end.
4. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.

I. Ceiling-Grid-Mounted Luminaires:

1. Secure to any required outlet box.
2. Secure luminaire to the luminaire opening using approved fasteners in a minimum of four locations, spaced near corners of luminaire.
3. Use approved devices and support components to connect luminaire to ceiling grid and building structure in a minimum of four locations, spaced near corners of luminaire.

3.04 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.

B. Luminaire will be considered defective if it does not pass operation tests and inspections.

C. Prepare test and inspection reports.

3.05 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions. Make up to two visits to Project during other-than-normal hours for this purpose. Some of this work may be required during hours of darkness.

1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

END OF SECTION

DIVISION 16 - ELECTRICAL

SECTION 16511 – FIRE STOPPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Section, apply to work specified in this section.

1.02 DEFINITIONS

A. Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in/ joints between fire rated wall and floor assemblies.

1.03 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

A. Only tested fire stop systems shall be used in specific locations as follows:

1. Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical bus ways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.

B. Safing slot gaps between edge of floor slabs and curtain walls.

C. Openings between structurally separate sections of wall or floors.

D. Gaps between the top of walls and ceilings or roof assemblies.

E. Expansion joints in walls and floors.

F. Openings and penetrations in fire-rated partitions or walls containing fire doors.

G. Openings around structural members which penetrate floors or walls.

1.04 RELATED WORK OF OTHER SECTIONS

A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections, including:

1. Section 03300 - Cast-In-Place Concrete
2. Section 07900 - Joint Sealers
3. Section 04200 - Masonry Work
4. Section 09200 - Lath and Plaster
5. Section 09250 - Gypsum Drywall Systems
6. Section 13080 - Sound, Vibration and Seismic Control
7. Section 13900 - Fire Suppression and Supervisory Systems

8. Section 15050 - Basic Mechanical Materials and Methods
9. Section 15250 - Mechanical Insulation
10. Section 15300 - Fire Protection
11. Section 15400 - Plumbing
12. Section 16100 - Basic Electrical Materials and Methods

1.05 REFERENCES

A. Test Requirements: ASTM E-814-02, "Standard Method of Fire Tests of Through Penetration Fire Stops"

B. Underwriters Laboratories (UL) of Northbrook, IL runs ASTM E-814 under their designation of UL 1479 and publishes the results in their "FIRE RESISTANCE DIRECTORY" that is updated annually.

1. UL Fire Resistance Directory:

a. Fire stop Devices (XHJI)
b. Fire Resistance Ratings (BXUV)
c. Through-Penetration Fire stop Systems (XHEZ)
d. Fill, Voids, or Cavity Material (XHHW)
e. Forming Materials (XHKU)

2. Alternate "Omega Point Laboratories Directory" (updated annually)

C. Test Requirements: UL 2079, "Tests for Fire Resistance of Building Joint Systems" (July 1998.)

D. Test Requirements: ASTM E 1966-01, "Standard test method for Fire Resistive Joint Systems"

E. Inspection Requirements: ASTM E 2174 – 01, "Standard Practice for On-site Inspection of Installed Fire Stops."

F. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments

G. ASTM E-84-01, Standard Test Method for Surface Burning Characteristics of Building Materials.

H. All major building codes: ICBO, SBCCI, BOCA, and IBC.
(Note to specifier: Retain or delete building codes listed above as applicable)

I. NFPA 101 - Life Safety Code

J. NFPA 70 - National Electric Code

1.06 QUALITY ASSURANCE

A. A manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.

B. Firestop System installation must meet requirements of ASTM E-814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.

C. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.

D. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

E. For those firestop applications that exist for which no UL tested system is available through a manufacturer, an engineering judgment derived from similar UL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Firestop Council (September 7, 1994, as may be amended from time to time).

1.07 SUBMITTALS

A. Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of UL firestop systems to be used and manufacturer's installation instructions to comply with Section 1300.

B. Manufacturer's engineering judgment identification number and drawing details when no UL system is available for an application. Engineer judgment must include both project name and contractor’s name who will install firestop system as described in drawing.

C. Submit material safety data sheets provided with product delivered to job-site.

1.08 INSTALLER QUALIFICATIONS

A. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer’s products per specified requirements. A supplier’s willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL label where applicable.
B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.
C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature restrictions.
D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

E. Do not use damaged or expired materials.

1.10 PROJECT CONDITIONS

A. Do not use materials that contain flammable solvents.

B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

D. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.

E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

PART 2 - PRODUCTS

2.01 FIRESTOPPING GENERAL

A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.

B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

C. Firestopping Materials are either “cast-in-place” (integral with concrete placement) or “post installed.” Provide cast-in-place firestop devices prior to concrete placement.

2.02 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with through penetration firestop systems (XHEZ) and joint systems (XHBN) listed in Volume 2 of the UL Fire Resistance Directory, provide products of the following manufacturers as identified below:

1. Hilti, Inc., Tulsa, Oklahoma (or equal)
800-879-8000

2.03 MATERIALS

A. Use only firestop products that have been UL 1479, ASTM E-814, or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type,

annular space requirements, and fire-rating involved for each separate instance.

B. Cast-in place firestop devices for use with non-combustible and combustible plastic pipe (closed and open piping systems) penetrating concrete floors, the following products are acceptable:

1. Hilti CP 680 Cast-In Place Firestop Device
   a. Add Aerator adaptor when used in conjunction with aerator ("sovent") system.

2. Hilti CP 681 Tub Box Kit for use with tub installations.

C. Sealants, caulking materials, or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:

1. Hilti FS-ONE Intumescent Firestop Sealant
2. Hilti CP 604 Self-leveling Firestop Sealant
3. Hilti CP 620 Fire Foam
4. Hilti CP 606 Flexible Firestop Sealant
5. Hilti CP 601s Elastomeric Firestop Sealant

D. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:

1. Hilti CP 601s Elastomeric Firestop Sealant
2. Hilti CP 606 Flexible Firestop Sealant
3. Hilti FS-ONE Intumescent Firestop Sealant

E. Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps, the following products are acceptable:

1. Hilti CP 672 Speed Spray
2. Hilti CP 601s Elastomeric Firestop Sealant
3. Hilti CP 606 Flexible Firestop Sealant
4. Hilti CP 604 Self-leveling Firestop Sealant

F. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal profile deck; as a backer for spray material.

1. Hilti CP 677 Speed Plugs
2. Hilti CP 767 Speed Strips

G. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:

1. Hilti FS-ONE Intumescent Firestop Sealant

H. Foams, intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:

1. Hilti FS-ONE Intumescent Fire stop Sealant
2. Hilti CP 618 Fire stop Putty Stick
3. Hilti CP 620 Fire Foam
4. Hilti CP 601s Elastomeric Fire stop Sealant
5. Hilti CP 606 Flexible Fire stop Sealant

I. Non curing, re-penetrable intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:

1. Hilti CP 618 Fire stop Putty Stick

J. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:

1. Hilti CP 617 Fire stop Putty Pad

K. Fire stop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:

1. Hilti CP 642 Fire stop Collar
2. Hilti CP 643 Fire stop Collar
3. Hilti CP 645 Wrap Strips

L. Materials used for complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical bus ways in raceways, the following products are acceptable:

1. Hilti CP 637 Trowelable Fire stop Compound
2. Hilti FS 657 FIRE BLOCK
3. Hilti CP 620 Fire Foam

M. Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical bus ways in raceways, the following products are acceptable:

1. Hilti FS 657 FIRE BLOCK

N. Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable:

1. Hilti CP 672 Speed Spray
2. Hilti CP 601s Elastomeric Fire stop Sealant
3. Hilti CP 606 Flexible Fire stop Sealant
4. Hilti CP 604 Self-Leveling Fire stop Sealant

O. Provide a fire stop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.

P. Provide a fire stop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction being penetrated.

PART 3 - EXECUTION

3.01 PREPARATION

A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

1. Verify penetrations are properly sized and in suitable condition for application of materials.

2. Surfaces to which fire stop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.

3. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.

4. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.

5. Do not proceed until unsatisfactory conditions have been corrected.

3.02 COORDINATION

A. Coordinate location and proper selection of cast-in-place Fire stop Devices with trade responsible for the work. Ensure device is installed before placement of concrete.

B. Responsible trade to provide adequate spacing of field run pipes to allow for installation of cast-in-place fire stop devices without interferences.

3.03 INSTALLATION

A. Regulatory Requirements: Install fire stop materials in accordance with UL Fire Resistance Directory or Omega Point Laboratories Directory.

B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration and construction joint materials.

1. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.

2. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of UL fire stop systems that might hamper the performance of fire dampers as it pertains to duct work.

3. Protect materials from damage on surfaces subjected to traffic.

3.04 FIELD QUALITY CONTROL

A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.

B. Keep areas of work accessible until inspection by applicable code authorities.

C. Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, "Standard Practice for On-Site Inspection of Installed Fire Stops" or other recognized standard.

D. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing fire stop systems already installed by other trades.

3.05 ADJUSTING AND CLEANING

A. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

B. Clean all surfaces adjacent to sealed holes and joints to be free of excess fire stop materials and soiling as work progresses.

END OF SECTION

DIVISION 16 – ELECTRICAL

SECTION 16707 – PUBLIC ADDRESS SOUND SYSTEM

1.01 PUBLIC ADDRESS AND SYSTEM COMPONENTS

A. Equipment Cabinet

1. The Middle Atlantic ERK-4425 equipment cabinet or approved equal shall be provided, meeting the following requirements:

   a. The cabinet shall be constructed of 16 gauge CRS throughout. It shall have 1/2" and 3/4" conduit knockouts on the top, bottom and rear flanges.

   b. All unused space shall have a black blank panel.

2. The Middle Atlantic DWR 24-17 or approved equal shall be provided, meeting the following requirements:

   a. The cabinet shall be constructed of 11 gauge CRS throughout. It shall have 1" and 2" conduit knockouts on the top, bottom and rear flanges.

   b. All unused space shall have a black blank panel

B. Microprocessor Communications Network

1. Bedford Village Elementary School – 96 Station Quantum – 90V System.

2. The communication system shall be a Bogen MULTICOM 2000 with the upgraded QUANTUM IP PROCESSOR CARD and grille, and shall provide a comprehensive communication network between administrative and staff locations. The central processor and switching unit shall be of the modular plug-in printed circuit board type, using HMOS microprocessor and TTL logic and HCMOS memory and sensing. HCMOS circuitry shall be protected with transient suppression devices on all inputs and outputs. Nonvolatile EPROM shall store permanent memory and nonvolatile EEPROM shall store field-programmable memory. System which uses a battery to maintain system configuration information shall not be acceptable. The system shall provide no less than the following features and functions:

   a. Telephonic communication, complete with DTMF signaling, dial tone, ringing and busy signals, and data display on administrative stations, shall use two wires (one is ground). Systems which use more than two wires for communication, tones and data display shall not be acceptable.

   b. Amplified-voice communication with loudspeakers shall use a shielded audio pair (shield can be used as one

of the two required conductors for phone or call-in switch).

1. Media Retrieval shall be accomplished without any additional conductors.

c. The system shall be available in the following configurations:

1. The system shall be rack-mounted. Station capacity shall be from 24 to 240 stations in increments of 24. All telephone stations shall have the ability to support displays. Station shall be expandable to 480.

d. The system shall consist of ANY COMBINATION OF staff, enhanced staff, and administrative stations (minimum of one administrative telephone required per system).

1. The staff stations shall consist of wall- or ceiling-mounted loudspeakers with call-in switches or handsets.

2. Enhanced staff stations shall consist of DTMF dialing telephone sets.

3. Administrative stations shall consist of DTMF dialing telephone sets with a four line by 16-character LCD display panel with alphanumeric, menu driven display. The phone shall be equipped with a standard 12 key push button dialing key pad, 9 dedicated auxiliary pushbuttons and 3 user-programmable buttons. Phones utilizing membrane-type keypads or requiring special function keys to perform common functions shall not be accepted as an equal. A built-in speakerphone shall be provided as a part of each administrative station. Power for the administrative phone is provided from the central exchange.

4. Enhanced staff and administrative stations shall have the option of including a loudspeaker.

5. All types of stations shall utilize the same type of field wiring. Future station alterations to require only station type change, not field wiring or system head-end alterations. All field wiring and system head-end equipment shall support any type of station, at the time of installation. All contractor proposals shall reflect this capacity. Failure to submit and bid this project in this manner will be deemed as being in direct conflict of these specifications and will be rejected.

6. There shall be no limit to the number of administrative display stations within the total capacity of the system (e.g. a 480 station will support 480 administrative display stations).
7. It shall be possible at any time to change the type of station at any location without extensive rewiring. Systems which limit the quantity of each station type, or require future additional equipment and/or system expansion to provide additional administrative telephones shall not be accepted as an equal.

e. The system shall be a global switching system, providing eight (8) unrestricted simultaneous private telephone paths. The system shall also be capable of providing up to eight (8) simultaneous amplified-voice intercom paths. One amplified intercom path shall automatically be provided with each increment of 24 stations of system capacity. All hardware, etc., required to achieve the maximum number of amplified-voice intercom channels for this system shall be included in this submittal. Amplified-voice intercom channels shall provide voice-activated switching. Systems requiring the use of a push-to-talk switch on administrative or enhanced staff telephones shall not be acceptable. There shall be an automatic level control for return speech during amplified-voice communications. The intercom amplifier shall also provide control over the switch sensitivity and delay times of the VOX circuitry.

f. It is of utmost importance that emergency calls from staff stations receive prompt attention. It is, therefore, important that there be an alternate destination in case the call does not get answered at the primary location. To this end:

1. Staff generated Emergency calls shall be treated as the highest system priority. Therefore, all Emergency calls shall annunciate at the top of the call queue of their respective administrative telephone(s). Should that emergency call go unanswered for 15 seconds, the call should re-route to an alternate speaker station then prompt the caller to make a verbal call for help. During the transfer, the original administrative telephone shall continue to ring the distinctive Emergency ring. Should the Emergency transfer to station have an associated administrative telephone, it too shall ring the distinctive Emergency ring.

2. The Emergency transfer to station shall be field programmable.

3. Should the original administrative telephone be engaged in a non-emergency conversation, its conversation shall be automatically terminated, indicated with an alert tone, and then reconnected to the station which generated the Emergency call.

4. Should the administrative telephone be engaged in an Emergency conversation, successive emergency calls shall log into the call queue as well as transfer to the emergency transfer station for their verbal call for help. Upon termination of the initial emergency conversation, the next one shall immediately ring the administrative telephone.

5. Systems failing to transfer unanswered Emergency calls or failing to immediately connect to the administrative telephone shall not be deemed as equal.

g. There shall be a system-wide emergency all-call feature. The emergency all-call shall be accessed by dialing "911" from designated administrative phones or by the activation of an external contact closure which shall give the third audio program input emergency status. The Emergency "911" all-call function shall have the highest system priority and shall override all other loudspeaker related functions including time tone distribution.

1. Considering that emergencies are to be treated with the highest level of concern, systems in which the Emergency-All-Call page from an administrative telephone is not the highest priority shall not be deemed as equal.

2. Upon picking up the receiver and dialing "9", a menu shall appear on the display prompting the user to enter each subsequent digit. In this way, the user shall not be required to memorize complicated key sequences in order to access emergency functions.

3. The emergency all-call shall capture complete system priority, shall be transmitted over all speakers. It shall also activate an external relay, which can be used to automatically override other systems

4. Systems without emergency all-call, or systems with all-call that cannot be activated by external means, or which do not capture complete system priority or activate an external relay, shall not be acceptable.

h. There shall be at least four built-in dedicated emergency alarm tones. Each may be accessed by dialing a three-digit number (912 through 915) from designated administrative telephones. These emergency tones should be separate from the time tones. Systems using external alarm generators, or having less than four emergency alarm tones shall not be acceptable.

1. Upon picking up the receiver and dialing "9", a menu shall appear on the display prompting the user to enter each subsequent digit. In this way, the user shall not be required to memorize complicated key sequences in order to access emergency alarm tones.

i. There shall be four (4) external-function relay driver outputs, accessible from designated administrative telephones by dialing a four digit number. These outputs remain set until accessed and reset at a later time. The user shall have the ability to review the status of each relay driver. This feature shall be supported by a plain English menu, prompting the user through the fields without requiring the user to remember any dialing sequences. Systems which require the user to remember complicated dialing schemes or prompt the user via cryptic commands shall not be deemed equal. Systems without relay driver outputs for control of external functions shall not be acceptable.

1. Upon picking up the receiver and dialing "9", a menu shall appear on the display prompting the user to enter each subsequent digit. In this way, the user shall not be required to memorize complicated key sequences in order to access external relay functions.

2. There shall be a program-material interface included, which shall accept up to three (3) Bogen D-Series program modules. Systems requiring an external program source interface shall not be acceptable.

j. There shall be an optional outside line feature. The optional circuitry shall interface with the station ports of an external telephone system, and shall provide facilities for up to eight (8) incoming lines which shall be designated by the user to ring "day" and "night" enhanced staff or administrative stations. Where an administrative station is designated to receive outside line calls, the phone shall ring with a unique tone and the outside line number shall appear on the display panel. The option shall also provide the ability to make outside line calls from enhanced staff or administrative stations. This ability shall be programmable for each phone and

there shall be three (3) access levels: no access, restricted access (local calls only), or unrestricted access (local and long-distance calls). This feature shall be capable of supporting DIL, DISA and a password protected DISA function.

1. Security is of the utmost concern. The password DISA feature shall be accessible only from an off-premise security office which monitors the facilities security system. It shall function as follows: Upon confirmation of the password DISA number, the system shall allow security personnel to dial access any station and monitor the activity without the preannounce and the privacy tones. This will then allow the security office to determine exactly what actions need to be taken.

k. The system shall provide for field-programmable three-digit or four-digit architectural station numbers.

l. An architectural-number/station-number cross-reference shall be field-accessible to facilitate service.

m. There shall be an automatic level control for return speech during amplified-voice communications.

n. Each station loudspeaker shall be assignable to any one, any combination, or all of eight (8) paging zones. Systems with less than eight (8) paging zones shall not be acceptable.

o. Each station loudspeaker shall be assignable to any one, any combination, or all, of eight (8) time-signaling zones. Systems with less than eight (8) time-signaling zones shall not be acceptable.

p. NOTE: Systems which use the same light zones as both page zones and time zones shall not be acceptable.

q. THERE SHALL BE EIGHT (8) TIME-SIGNALING SCHEDULES WITH A TOTAL OF 1024 USER-PROGRAMMED EVENTS. Each event shall sound one of eight (8) user-selected tones. It shall be possible to assign each schedule to a day of the week, or manually change schedules from an authorized administrative telephone. Systems which do not provide eight (8) time-signaling schedules or a choice of eight (8) time tones shall not be acceptable.

r. An internal program clock (with battery back-up) shall be included, allowing a total of 1024 user-programmed events. It shall be possible to synchronize the program clock with an external master clock. Systems which do not provide an internal

program clock not meeting these specifications shall provide an external program clock that does. This external program clock shall then synchronize daily with the system clock to ensure that all time displays are the same.

1. There shall be eight (8) time signaling schedules. It shall be possible to assign each schedule to a day of the week, or manually change schedules from an authorized administrative telephone.

2. Each event shall be able to be directed to any one or more of the eight (8) time-signaling zones.

3. Each of the eight (8) time zones shall have a programmable "tone duration" unique unto itself. For example: the gymnasium shall receive a time tone for ten (10) seconds while the rest of the facility receives a tone for five (5) seconds.

4. Each event shall sound one (1) of eight (8) user-selected tones. Each event may utilize a different time tone. It shall be utilized to send the gymnasium, shop classes, and pool (if necessary), a separate time tone to indicate "clean up". Minutes later the entire facility can then receive the same time tone to indicate class change.

5. Each of the eight (8) distinct time tone signals may be manually activated by selected administrative telephones. These tone signals shall remain active as long as the telephone remains off-hook, or until canceled from the keypad.

6. Upon picking up the receiver and dialing "9", a menu shall appear on the display prompting the user to enter the next digit. In this way, the user shall not be required to memorize complicated key sequences in order to access manual time-tone functions.

7. Systems which do not provide eight (8) time signaling schedules or do not provide automatic activation of schedules shall not be acceptable.

s. There shall be a zone-page/all-page feature that is accessible by selected enhanced staff and administrative stations.

1. There shall be automatic muting of the loudspeaker in the area where a page is originating.
2. There shall be a pre-announce tone signal at any loudspeaker selected for voice paging.

3. Upon picking up the receiver and dialing "#", a menu shall appear on the display prompting the user to enter the next digit. In this way, the user shall not be required to memorize complicated key sequences in order to access paging functions.

t. There shall be a voice-intercom feature that is accessible by selected enhanced staff stations and all administrative stations.

1. There shall be a periodic privacy tone signal at any loudspeaker selected for amplified-voice communication.

2. There shall be a pre-announce tone signal at any loudspeaker selected for voice-intercom communication.

3. Privacy and pre-announce tone signals shall be capable of being disabled during system initialization.

4. There shall be an automatic switch-over to private telephone communication should the person at the loudspeaker pick up his handset.

5. Upon picking up the receiver and dialing the first digit of the number of the station to be called, that number shall appear on the display along with a loudspeaker symbol, prompting the user to enter the next digits. There shall be no confusion as to the type of conversation that is to be established.

u. There shall be a telephonic communication feature which is accessible by all enhanced staff and administrative stations.

1. There shall be an audible ring signal announcing that a call has been placed to that station.

2. Upon picking up the receiver and dialing "*", a telephone symbol shall appear on the display, prompting the user to enter the number of the station to be called. There shall be no confusion as to the type of conversation that is to be established.

v. There shall be an automatic disconnect of staff handsets left off-hook to prevent them from tying up communications channels. The station shall receive a busy signal and shall automatically disconnect after 45 seconds. Systems not preventing idle off-hook telephonic stations from tying up communication channels shall note and specifically submit an alternate method and equipment list to achieve the same function.

w. There shall be an automatic disconnect of administrative and enhanced staff stations to prevent them from tying up communications channels. When a station goes off-hook and does not initiate a call within ten (10) seconds, the station shall receive a busy signal and shall automatically disconnect after 45 more seconds. Systems not preventing idle off-hook telephonic stations from tying up communication channels shall note and specifically submit an alternate method and equipment list to achieve the same function.

x. There shall be an automatic disconnect of administrative and enhanced staff stations to prevent them from tying up communications channels. When a station goes off-hook and does not initiate a call within ten seconds, the station shall receive a busy signal and shall automatically disconnect after 45 more seconds.

y. Staff and enhanced staff stations may be programmed to ring an administrative telephone during day hours and another administrative telephone during night hours. Day and night hours shall be user-programmable. Assignment of staff stations shall not be restricted to any particular administrative station. Systems that limit the number and assignment of staff call-in to particular administrative station or groups of administrative stations shall not be acceptable.

z. Each staff station shall be programmable for three levels of call-in, as follows:

    1. Level 1 - Normal/Emergency

    2. Level 2 - Urgent/Emergency

    3. Level 3 – Emergency

    4. Staff stations programmed for access level 1 or 2 shall be able to initiate an emergency call by repeated flashing of the hook switch or repeated pressing of the call-in switch. Systems which require additional switches and/or conductors to initiate an emergency call shall not be acceptable.

a. Emergency calls from staff stations shall interrupt a non-emergency call in progress at the designated administrative phone. The administrator shall receive a warning tone and be connected to the emergency caller. The disconnected party shall receive a busy signal. Systems which do not provide emergency call interrupt shall not be acceptable.

b. It shall be possible to connect a single push emergency call-in switch to any staff or enhanced staff station, without effecting normal station operation.

aa. Calls from staff stations shall be logged into queue for the designated administrative telephones.

1. Administrative phones shall ring for a period of 45 seconds when they receive a call, and then stop ringing.

2. Each queue shall first be sorted according to call priority (emergency calls, then urgent calls, and then normal calls). Calls are sorted within each priority level on a first-in first-out basis. When a call is answered, it shall automatically be removed from the queue. Systems which do not sort calls according to priority and order received shall not be acceptable. 1) The display shall simultaneously show up to four calls pending. Additional calls, beyond four (4), shall be indicated by an arrow pointing down thus prompting the user that additional calls are waiting.

3. It shall be possible to answer any incoming call simply by picking up the handset while it is ringing. It shall not be necessary to hit any buttons to answer a call.

4. "Single-Button" response. It shall be possible to answer any incoming staff call after the ringing has stopped by pressing a single button (key) on the administrative telephone. The system shall automatically call the first station shown on the display.

5. If there are any remaining calls on the queue when the administrative phone is hung up, a re-ring signal shall sound at the phone alerting the user to their presence.

6. It shall be possible to scroll through the call-waiting queue and answer calls in any

order. It shall be possible to delete all unanswered normal and urgent calls. Simply pressing the "*" button twice shall auto-dial the station appearing in the top of that current display window.

7. Unanswered normal and urgent calls shall remain in their respective queues for a user-programmable length of time, then be automatically deleted. Emergency calls shall be deleted from their queue only by answering the call.

8. Other than Emergency calls, the user shall have the ability to answer calls in random order. Emergency calls shall be responded to in the order in which they are received.

bb. Enhanced staff stations shall receive dial tone upon going off-hook. Outgoing calls are made by dialing the desired station. Incoming calls can be directed to the telephone or to the associated loudspeaker for a hands-free reply. There shall be an automatic switch-over from loudspeaker to private telephone communication should the person pick up his handset.

1. Enhanced staff stations shall be programmable for one (1) of three (3) levels of system access, as follows:

a. Level 4 shall permit dialing any administrative station, toggle program material on/off at their location by use of the telephone dial pad, have access to outside lines (if so authorized), but designated to receive outside line calls, and call-forward to other enhanced staff phones or administrative phones. They shall also have the ability to be programmed to dial access any other stations telephonic device only.

b. Level 5 capabilities of the level 4 station plus dial any administrative or staff station phone or loudspeaker and make conference calls or transfer calls.

c. Capabilities of the Level 5 station plus single-zone page and all-zone page.

2. All enhanced staff stations shall be able to initiate an emergency call by flashing the hook switch or utilizing a dedicated Emergency-Call switch. The Emergency-Call switch shall generate the pulses necessary to create an Emergency Call in. Emergency calls shall ring the designated day/night administrative

station. If the emergency call is not answered within a predetermined time period the loudspeaker at the calling station will be connected to the emergency station. Telephones with dial pads in the classrooms shall have the ability to generate emergency calls in addition to their normal functions. Systems which do not allow for Emergency call generation directly from a dial type telephone shall supply separate call switches to meet this function.

cc. Enhanced staff stations shall be able to make a normal call to any administrative telephone by dialing the number. Enhanced staff stations shall also be able to initiate an emergency call by flashing the hook switch. Emergency calls shall ring the designated day/night administrative station and then their speaker will be connected to the emergency station if not answered within a predetermined time period.

dd. Administrative stations shall receive dial tone upon going off-hook. Outgoing calls are made by dialing the desired stations. Incoming calls can be directed to the telephone or to the associated loudspeaker for a hands-free reply. There shall be an automatic switch-over from loudspeaker to private telephone communication should the person pick up his handset.

1. System functions are accessed by going off-hook and dialing "9". Further operations are menu assisted in all cases. All administrative telephones shall permit the following operations:

a. Direct-dial private two-way telephone communications with other administrative stations, enhanced staff stations and handset stations. This shall not be limited by any station grouping and shall not occupy more than a single communication path.

b. Direct-dial two-way amplified-voice communications with any station loudspeaker. This shall not be limited by any station grouping and shall not occupy more than a single communication path.

c. Toggle reception of program material on/off at their speaker station by use of the telephone dial pad.

ee. Administrative stations shall be equipped with a 4-line by 16-character alphanumeric display panel.

1. The display shall normally show the time-of-day and day of week, the current time signaling schedule, and the numbers of up to four stations calling in along with the call-in status of each station (normal, urgent, emergency). When dialing from the administrative phone, the display shall indicate the station number and type of station (loudspeaker or handset) being dialed.

2. The display shall also provide user-friendly menu selections to assist the operator when paging and distributing program material. Displays shall be in English with internationally recognized symbols for maximum ease of use. Systems which require the operator to memorize long lists of operating symbols or control codes shall not be acceptable.

ff. Administrative stations shall be programmable for three levels of system access, as follows:

1. Level 7 - Shall permit dialing any station in the system, turn program material on/off at their location, scroll, erase and auto-dial call-waiting queue, make conference calls and transfer calls, call forward to other administrative stations, make all-zone pages and emergency all-zone pages, have access to outside lines and be designated to receive outside line calls.

2. Level 8 - Capabilities of the Level 7 station plus select and distribute/cancel program material to and combination of stations, paging zones or all zones; set/reset alarm/external functions and zone page.

3. Level 9 - Capabilities of Level 8 station plus bump or join a conversation in progress, manually initiate time tones and have access to system and station programming functions (when accompanied by a valid password).

gg. Program selection, and its distribution or cancellation shall be accomplished from a designated administrative telephone, with the assistance of the menu display system. Distribution and cancellation shall be to any one, or combination of speakers, or any zone(s), or all zones. Systems which rely on switchbanks to perform the above functions shall not be accepted as an equal.

hh. It shall be possible, via an administrative telephone, to manually initiate any of eight (8) tones. The tones shall be separate and distinctly different from the emergency tones. The tone selected shall continue to sound until it is canceled, or until the administrative phone is placed back on-hook.

ii. Each administrative telephone shall maintain a unique queue of all stations calling that particular phone.

1. Program selection, distribution or cancellation shall be accomplished from a designated administrative telephone, with the assistance of the menu display system.

2. Select shall be from any one of three possible audio program inputs, or none.

3. Distribution and cancellation shall be to any one, or combination of speakers, or any zone(s), or all zones.

4. Upon selecting a program source, the selecting administrator's loudspeaker shall automatically activate and function as a monitor speaker. The loudspeaker shall remain active as long as the administrator is in the program selection / distribution / cancellation menu of the display.

5. It shall be possible to, at any time, select, redirect or cancel the program distribution to any station, zone or all locations.

6. Systems which require the office personnel to leave their work station and go into the equipment cabinet simply to accomplish these functions shall not be acceptable.

7. Systems which rely solely on switchbanks to perform the above functions shall not be accepted as an equal.

8. Upon picking up the receiver and dialing "9", a menu shall appear on the display prompting the user to enter each subsequent digit. In this way, the user shall not be required to memorize complicated key sequences in order to access program distribution functions.

jj. System programming shall be from an administrative telephone with Level 9 access. All system programming data shall be stored in nonvolatile memory. A valid password shall be required to gain access to the following programmable functions:

1. Set Day and Time.

2. Program time-signaling events, time signaling schedules, and assign schedules to days of the week.

3. Program time signaling zones.

4. Program paging zones.

5. Manually change time signaling schedules.

6. Upon picking up the receiver and dialing "9", a menu shall appear on the display prompting the user to enter each subsequent digit. In this way, the user shall not be required to memorize complicated key sequences in order to access system-programming functions.

kk. System initialization shall be accomplished from an administrative telephone with Level 9 access. All system initialization data shall be stored in nonvolatile memory. A password (separate from the password necessary for system programming) shall be required to gain access to the following system initialization parameters:

1. Bell duration for each time zone.

2. Queue time-out.

3. Day start/night start time.

4. Designate emergency station.

5. System programming password.

6. Architectural dialing.

7. Privacy beep.

8. Preannounce tone.

ll. Station Initialization shall be accomplished from an administrative phone with Level 9 access. All station initialization data shall be stored in nonvolatile memory. A password (separate from the password necessary for system programming) shall be required to gain access to the following station initialization parameters:

1. Set station access level.

2. Set station architectural number.

3. Set day administrator.

4. Set night administrator.

5. Assign access to outside lines.

6. The system shall be capable of being interfaced with either an on-site or off-site computer for system configuration programming and system diagnostics. It shall be possible to change the baud rate of the system.

7. Diagnostics shall also be built into the administrative telephones and accessible only by authorized personnel. Diagnostics shall indicate passes and failures of system memory, system clock, all audio busses, tone generators, DTMF generators and decoders and the integrity of the field wiring.

8. The diagnostics feature shall be completely menu driven. It shall be possible to individually select the test and card, or all to run diagnostics on. This shall be a standard feature of the system and supplied at the time of installation. It shall be accessible only by authorized stations and personnel.

9. Systems not capable of supporting the computer interface for programming and diagnostics, nor supportive of built-in diagnostics for the end user shall not be deemed as equal.

mm. The contractor shall make available, and maintain a satisfactory service department capable of furnishing equipment inspection and service.

nn. The contractor shall be prepared to offer a service contract beyond the warranty period.

oo. The contractor shall instruct personnel designated by the owner in the proper use, basic care and maintenance of the equipment. Such training shall be provided as an integral component of the system.

pp. The contractor shall warrant the system to be new and free of defects in material and workmanship, and will, within one year from the date of installation, repair or replace any equipment found to be defective. This warranty shall not apply to any equipment which has been subject to misuse, abuse, negligence, accident or unauthorized modification.

C. Quantum Multicom IP – QSPC1 Processor

1. The Quantum facility shall have a minimum of one node/processor and a maximum of 64 interconnected

nodes/processors. A maximum of 99 facilities can be interconnected into a district.

2. The station numbers, program buses, etc. shall be identified with a QSPC1#, Station card# and port# or QSPC1#, program#.

3. Audio Information will be transmitted between the processors on the LAN using VoIP technology. Quantum will utilize all of the existing Multicom 2000 hardware except the current processor card. Thus making Quantum Multicom IP backwards-compatible with existing Multicom 2000 systems.

4. The processor software shall be upgradeable via Quantum Commander. The Quantum automatically reboots after it installs the software upgrade. If for some reason the newly installed software will not boot properly, the system shall revert to the previous working load.

5. It shall be possible for Quantum schools to exchange 'station-to-station' calls and 'inter-facility All-Call paging' to a single facility or all facilities in a district using VoIP technology.

6. The primary QSPC1 shall be configured to act as a Gateway for facility point-to-point calls. Using Quantum Commander, every facility shall be configured with the IP addresses of the primary QSPC1 systems of all the other known facilities (maximum of 98 additional), and an organizationally private multicast IP address (i.e. 239.x.y.z series), which shall be used for inter-facility paging.

7. The maximum number of simultaneous inter-facility point-to-point calls supported is based on the actual performance of the network and the CPU load. The voice quality of the inter-facility calls may vary based on the network conditions.

8. The system shall facilitate the playing of short audio clips repetitively played until stopped by the Quantum Commander User or administrative display phone MCDS4 whichever occurs earlier.

9. A built-in Master Program Clock, with battery backup, shall be included to automatically control class change or other signals. The Master Program Clock shall have 1024 events that may be programmed into any of the 32 time signaling schedules, and/or 32 flexible holiday schedules. Systems that rely on external master clock shall not be considered equivalent.

10. Network Time Synchronization. The system shall be capable of periodic update/synchronization of the processor's time with a Network Time Server via the school's LAN network. Systems that do not provide Network Time Synchronization will not be deemed equivalent.

D. Quantum Commander

1. The processor utilizes a web-based programming tool. The Quantum Commander is built into the QSPC1 processor card and upon boot up, users can login to the Quantum Commander Web Server via their web browser.

2. The Quantum Commander shall be broken into three access levels depending on user access credentials. Systems that do not provide at least three (3) levels of access are not equal.

3. Only the Administrator and Technician shall have access to add/delete/modify the database objects.

4. Users shall have display only access to see the data objects that include configuration, alarms, and performance data and perform certain operations based on the user's CoS (Class of Service).

E. Administrative Telephone

1. BOGEN MCDS-4 administrative display telephone shall be provided, meeting the following technical requirements:

a. The phone shall be a DTMF-type with 12 positive action push-buttons similar to those available on standard telephone equipment. Phones that provide membrane-type push-buttons shall not be acceptable.

b. The phone shall provide full two-way private communication with any other system telephone, or intercom communication with any system staff station speaker.

c. The phone shall have its own internal microprocessor and shall provide for full implementation, control and display of the Multicom 2000 operational functions and modes.

d. Each administrative station shall also support a loudspeaker.

e. The phone shall be equipped with a 4 line by 16 character LCD-type display panel which shall normally show the time of day, day of week, current time signal schedule, room numbers and priority level of the first three incoming staff calls.

f. All incoming calls shall ring the MCDS for 60 seconds and appear on the top of the display.

g. Unanswered calls shall be logged in order of priority, as a call-back request.

h. Incoming emergency calls shall activate a dedicated ring signal and shall cause the word “HELP" to flash on the display panel.

i. Routing of incoming emergency calls to a dedicated emergency speaker station shall be available in the event the administrative phone is unanswered.

j. A "Plain English" menu routine shall be provided to guide the operator through scrolling, auto-dial and que erase functions.

k. A "Plain English" system setup menu shall be provided to designated administrative telephones, with the entry of a valid password.

l. The menu shall permit setting the time and day of week, programming time-signaling events, time zones, page zones and outside line access.

m. A second password shall be required to access the system "Initialization" menu which shall permit full control over system functions and station functions.

n. All telephonic communication, including DTMF signaling, dial tone, ringing, busy signals and data display shall use two wires. Instruments that require more than two wires shall not be acceptable.

o. The unit shall have a built in speaker for hands free communication.

p. An auto redial button shall be incorporated on the telephone.

q. Feature button that performs speed dial w/ 10 number memory shall be included.

r. Three "hot keys" on telephone will allow the phone to dial preselected number.

s. Telephone which provide membrane-type push-button switches will not be accepted as an equal.

F. MCTCA Telephone Interface Card – 1 Required Per School

1. The telephone system interface shall be a Bogen Model MCTC, designed for use with the Bogen MULTICOM 2000 Administrative Communication System. The interface must provide up to eight (8) station ports which shall function as trunk ports for the purpose of connecting the MULTICOM 2000 system to an outside telephone system. The interface shall operate with telephone systems supplying a 90-volt ring signal and loop detection.

2. Up to two MCTC interface systems can be installed per system. Each interface system shall consist of the following components:

a. Bogen Model MCTC circuit card
b. Bogen Model MCOC connector card
c. Bogen Model MCOCA ribbon cable

3. The MCTC circuit card shall occupy one slot of the MULTICOM 2000 card frame. It provides the relays and isolation transformers required to interface with the telephone system. The MCOC connector card shall be mounted to an outside panel of the cardframe and shall provide eight (8) modular jacks for connection to the telephone system. The MCOCA ribbon cable shall interconnect the MCOC card with the card cage backplane. Modular telephone cable, terminated with standard modular plugs shall be used to connect to the telephone system.

4. Each station port shall use optical isolators to detect the 90-volt ring signal from the telephone line. When the ring signal is detected, the station shall ring one user-selected enhanced staff or administrative telephone during system "day" hours and one during system "night" hours. In the case of an administrative telephone, a unique ring signal shall sound and the architectural number assigned to the station port shall appear on the telephone's display panel. When the ringing telephone is answered, the station shall establish a loop connection between the telephone and the outside line.

5. Following a call, the MCTC shall recognize the disconnect pulse provided by the telephone company. The first line in the system shall also recognize a reorder tone for disconnect.

6. A Direct Inward System Access Feature shall be provided. This feature may be password protected for use by authorized personnel only. Facilities shall also be provided to call-forward an incoming call. It shall also be possible to add a third party to the line (conference call), or to transfer calls.

7. Outgoing calls shall be possible from any enhanced staff or administrative telephone; however, facilities shall be provided to deny or restrict access. A 2-button sequence (menu-guided on the administrative telephone's display panel) shall be used to initiate an outside call. Stations with restricted access shall be able to place local calls only. Stations with unrestricted access shall be able to place local and out-of-area calls.

8. A circular hunt shall be used to assign outgoing calls to the outside lines, to ensure balanced use of the lines. An outside dial tone shall be returned when access to the line is achieved. A busy tone shall be returned if a connection is not achieved or not allowed.

G. DESK DIALING TELEPHONE FOR MULTICOM 2000

1. The enhanced staff station telephone(s) shall be a BOGEN Model MCESS desk-type telephone, or approved equivalent.
   a. The unit shall be a standard DTMF-dialing telephone with 12-positive action push-buttons. Phones which provide membrane-type push-button switches shall not be accepted as an equal.

b. The telephone shall be constructed of molded high-impact ABS finished in a permanent beige color. The receiver shall contain a dynamic receiver and cardon transmitter. A coil cord, terminated in standard modular plugs, shall be supplied to connect the handset to the telephone base.

c. The enhanced staff telephone shall permit rapid, efficient, and reliable control of the operational features available to enhanced staff stations in MULTICOM 2000 Communication Systems. The specific features available shall be determined by the station's access level, as assigned during the initial system configuration programming.

d. When the enhanced staff station is equipped with the telephone alone, connection to the MULTICOM 2000 System shall require only 2 wires. When the enhanced staff station is equipped with the telephone and a loudspeaker, connection to the MULTICOM 2000 System shall require a shielded pair plus one conductor.

e. The telephone shall require 5-1/2" x 9" of desk space and shall be supplied with a modular cord and surface-mounting junction box.

H. Wall-Mounting Dialing Telephone For Multicom 2000

1. The enhanced staff station telephone(s) shall be a BOGEN Model MCWESS/V wall-mounting telephone, or approved equivalent.

a. The unit shall be a standard DTMF-dialing telephone with 12-positive action push-buttons. Phones which provide membrane-type push-button switches shall not be accepted as an equal.

b. The telephone shall be constructed of molded high-impact ABS finished in a permanent beige color. The receiver shall contain a dynamic receiver and carbon transmitter.

c. The enhanced staff telephone shall permit rapid, efficient, and reliable control of the operational features available to enhanced staff stations in MULTICOM 2000 Communication Systems. The specific features available shall be determined by the station's access level, as assigned during the initial system configuration programming.

d. When the enhanced staff station is equipped with the telephone alone, connection to the MULTICOM 2000 System shall require only 2 wires. When the enhanced staff station is equipped with the telephone and a loudspeaker, connection to the MULTICOM 2000 System shall require a shielded pair plus one conductor.

e. The telephone shall require 4" x 9" of wall space. It shall be supplied with a wall-mounting plate which shall fit a standard single-gang box (not supplied). The plate shall be equipped with a modular jack.

f. The unit shall have a 30” armored handset cord.

I. HALLWAY AMPLIFIER

1. Amplifier shall be an Peavey 1502 and shall meet the following technical requirements:

a. The amplifier shall be a solid state monaural device employing true complimentary output circuitry.

b. The amplifier shall provide a balanced multi impedance output transformer for 70 volts, 25 volts, 8 ohms and 4 ohms.

c. The input shall provide a transformer for balanced line inputs.

d. The amplifier shall contain sensing circuitry providing protection for the output transistors against over temperature, excessive output voltage, radio frequency interference, excessive output current, and excessive output phase shift.

e. The amplifier load shall be protected against sub-sonic signals, start-up/shut-down transients, low AC line voltage and D.C.

f. The amplifier shall have rear mounted controls that include input level, 300Hz high pass filter, 15dB attenuator, 5 lug screw terminal connector and a 3 pin XLR female connector.

g. The amplifier front panel shall include a power on/off indicator, signal clipping indicator and a protection circuit activation indicator.

h. The amplifier output power shall be 75 watts RMS from 20Hz to 20kHz at less than 0.1% THD.

i. The amplifier input shall be transformer isolated with a nominal 15k ohms impedance.

j. The amplifier hum and noise figure shall be at least 100dB below rated output power.

k. The amplifier shall measure 5.25"H x 19.0"W x 12.5"D and shall weigh 24 lbs.

J. METAL SURFACE BAFFLE

1. The metal baffle shall be Bogen MB8TSL (Sloped) or MB8TSQ (Square) or approved equal meeting the following technical requirements:

a. The baffle shall feature an offset in the direction of radiation, and a rectangular loudspeaker cutout.

b. Baffle shall utilize separate mounting bracket arms to eliminate the exposure of front screw heads.

c. Acoustical and mechanical treatment of baffle shall include welded cold rolled steel construction and separate loudspeaker mounting plate.

d. Baffle shall be finished in a baked metallic aluminum paint. (Baffle shall be finished in a hard baked semi-gloss white enamel.)

e. Baffle dimensions shall be 10 1/2" (267mm) wide x 14" (356mm) high with a projection of 5 5/8" (143mm).

f. Baffle shall mount a standard 8" (203mm) loudspeaker.

K. Ceiling Baffle

1. The ceiling baffle shall be Bogen S86T725PG8W or equal meeting the following technical requirements:

a. The baffle shall have an overall dimension of 12-7/8 and shall mount on standard 8 speaker transformer assemblies.

b. The baffle shall be constructed of 22 gauge steel.

c. The baffle shall have 4 mounting studs for speaker/transformer assemblies.

d. The baffle shall be finished in a white baked epoxy.

e. The baffle shall have a minimum of 66% open-hole pattern.

L. Ceiling Back Box

1. The back box shall be Bogen RE84 or equal, meeting the following technical requirements:

a. The back box shall be constructed of 22 gauge cold rolled steel.

b. The back box shall be coated with a durable protective finish to prevent rusting.

c. The unit shall have four 1/2-3/4 standard electrical knockouts. Knockouts shall be 90o apart.

d. The unit shall have four #8-32 J-nuts at 90o apart. This shall be the mounting point for the speaker baffle.

M. Ceiling Bridge Support

1. The bridge support shall be Bogen TBS8 or equal, meeting the following technical requirements:

a. The bridge support shall be constructed of 22 gauge steel.

b. The unit shall have an overall dimension of 22-3/4. This dimension shall span the distance between standard 2x2 or 2x4 drop ceilings.

c. The unit shall have mounting tabs to accept back box

N. Drop In 2x2 Ceiling Speaker

1. The speaker shall be a Bogen Model CSD2X2 or CSD2X2VR Drop-In Ceiling Speaker.

a. The Speaker shall be fully enclosed and constructed of industrial grade steel. It shall be comprised of a damped high compliance factory-mounted 8" loudspeaker that shall consist of an 8" treated paper main cone, a secondary high frequency cone, and a 10 ounce magnet.

b. The unit shall have a 70V/25V transformer with power taps of 4, 2, 1, 0.5, and 0.25 watts, selectable by rotary switch. Output shall be 94 dB @ 1 watt / 1 meter (min.). Frequency response shall be 95 Hz to 20 kHz (min.).

c. The speaker shall include 4 seismic attachment points. The speaker shall have a non-reflective, off-white or bright white (''U'' versions) metal finish grille.

d. Speaker is listed to UL Standard 1480 for U.S. use.

O. Raw Frame Speaker

1. The dual cone 8-inch speaker shall be Bogen Model S86T75.

a. It shall be of the permanent magnet type having a seamless molded fiber cone with a hard fiber whizzer cone mechanically coupled to the voice coil for extended high frequency response. It shall be capable of producing a uniform audible frequency response over the range of 47Hz-20kHz+6dB with a dispersion angle of 120-degrees @ 2000Hz-6dB. The average sensitivity shall measure 95dB (SPL at 1W/1M). Rated power handling capacity shall be 15 watts RMS. The voice coil shall have a 1-in. dia. and shall operate in a magnetic field derived from a strontium ferrite (ceramic) magnet having a nominal weight of 10 oz. The voice coil impedance shall be 8 ohms. The speaker shall have a round, structurally reinforced stamped 20-ga. steel frame to maintain precise mechanical alignment and shall provide facilities to mount a transformer. The speaker shall have an overall dia. of 8.062-in. with eight obround holes equally spaced

at 45-degrees on a 7.625-in. dia. mounting bolt circle. The overall depth shall not exceed 2.84-in. (not including transformer). External metal parts shall be zinc-plated to resist rust and corrosion.

b. For 25 or 70.7 volt distributed systems: The speaker shall be equipped with a transformer, factory-mounted and wired. The transformer's primary voltage shall be 25 and shall provide selectable power taps of .5,1,2,4 watts.

P. CD Player with iPOD Dock

1. The compact multi-disc player shall be Tascam CD-200iL and shall meet the following technical requirements:

a. The CD player shall provide automatic selection one compact disc, iPod, or Auxiliary Jack

b. The frequency response shall be 5Hz to 20,000Hz 1dB and the signal to noise ratio shall be greater than 93dB.

c. The dynamic range shall be 90dB with a THD of .01%. The wow and flutter shall be immeasurable.

d. The unit shall be rack mountable with a rack mount assembly.

Q. Tuner/Tape Player

1. The auxiliary program source shall be a Bogen Model DST1 FM-stereo/FM/AM tuner, or equivalent, and shall provide the following:

a. The unit shall be capable of FM/stereo reception, and shall have an internal AFC circuit. The stereo separation shall be more than 35dB. An FM-stereo signal indicator light, and an illuminated display of station frequency shall be provided.

b. Program and tuning aids shall include illuminated tape direction indicators, a tape program switch, and a monaural/stereo signal switch. A 5 watt stereo amplifier shall be built in.

c. The unit shall operate from a 120VAC, 60Hz power source and shall consume six watts. It shall be mountable in a standard 19” equipment rack using the BOGEN RPK-55 accessory rack panel kit. The dimensions shall be 9-3/4”D x 7-3/16”W x 2”H (24.7 x 18.3 x 5.0 cm). The shipping weight shall be 5 pounds.

R. FM Outside Antenna

1. Shall be the Y-FM-2 which is a twin dipole FM antenna.

a. Two ½ wave dipole elements mounted 90° to one another on the antenna mast give this antenna an omnidirectional reception pattern.

b. Maximum transfer of received signals is assured by a weatherproof gamma match.

2. An F-type connector accepts cable sizes from RG-59/U to .412 aluminum.

3. Elements are attached to the boom (not supplied) with solid aluminum blocks.

4. Element ends are sealed with end caps to minimize wind noise.

5. Antenna cable shall be RG59 coax cable.

S. Microphone(s) - 1 Required

1. The Shure PG-58 Cardioid Dynamic Microphone shall be provided meeting the following technical requirements:

a. The microphone shall be a dynamic moving coil type.

b. The frequency response shall be 80Hz to 12kHz specially shaped above 1kHz to maintain presence and articulation for voice input.

c. The microphone shall be of the low impedance type and shall include a 25’ cable with XLR connectors as required by the owner.

d. The microphone sensitivity shall be a minimum of -61dB.

e. The microphone shall have an integral on/off switch, so connected that the transformer is “shorted” when the switch is in the off position.

f. The microphone shall have a Mylar diaphragm with an internal POP filter and shock mount for the dynamic element.

g. The microphone case shall be constructed of steel and zinc die cast components with a non-reflective grey finish.

T. FLOOR MIC STAND - 1 Adjustable Floor Mic Stand Required

U. HORN LOUDSPEAKER

1. The loudspeaker shall be a B0GEN Model SPT-15A or approved equal, reentrant type horn loudspeaker, meeting the following technical requirements:

a. The frequency response shall be from 275Hz to 14kHz. Rated power output shall be 15 watts, RMS continuous. Dispersion shall be 110 degrees. Sound pressure level, measured four feet on axis with 15 watt input @ 1000Hz, shall be at least 121dB.

b. The unit shall incorporate a seven-position weather-sealed switch, to allow matching the loudspeaker to a 25V or 70V constant-voltage line. Power handling capacity shall be adjustable at 70V to 0.9, 1.8, 7.5, or 15 watts, and at 25V to 0.48, 0.94, 1.8, 7.5 or 15 watts. Impedance shall be adjustable to 5000, 2500, 1300, 666, 333, 89, or 45 ohms.

c. The loudspeaker shall be of weatherproof all metal construction, with driver enclosed within a waterproof housing. The loudspeaker shall include a self-aligning field-replaceable diaphragm.

d. Screw terminal connections shall be provided for connection to the audio line. A plastic cover shall be provided to protect the connectors and impedance selector switch, and provide strain relief for the audio line.

e. An all-purpose mounting bracket shall provide precise positioning in the vertical and horizontal planes with a single adjustment. The bracket shall include banding slots to permit mounting the loudspeaker on beams or pillars. Bracket and loudspeaker shall be finished in textured mocha enamel. The unit shall measure 8”W x 8”H x 9”D. Shipping weight shall be 4 ½ lbs.

V. Volume Control

1. The speaker line attenuator shall be a Bogen model (ATP10 or ATP35), and shall permit setting the output level at loudspeakers on a 25V or 70V line without altering the amplifier volume setting. The attenuator shall also have the ability to override the volume control setting when activated by 9V to 30V DC so that important and emergency messages will be heard at all speaker locations. The attenuator shall provide a choice of 10 stops and an “off” position, and shall be capable of controlling up to 10-/35-watt speaker systems. The attenuator shall measure (2-3/4" W x 4-1/2" H x 2-5/8" D for ATP10 or 4-5/8" W x 4-5/8" H x 3" D for ATP35), weigh (13 oz. for ATP10 or 14 oz. for ATP35), and feature etched faceplate markings.

W. TERMINAL STRIPS

1. Terminal Strip Assembly:

a. All wires and cable leaving main equipment cabinet will have a standard screw type terminal strip.

b. This terminal strip shall be capable of accepting wires as large as 18 gauge.

c. Space type lug connectors or compression type terminal strips shall be utilized.

d. The terminal strips shall be numbered and shall correspond to field documentation.

e. Use of standard telephone type connectors, such as 66M150 plugs or 110 plugs, are not an acceptable method of terminating field wiring to equipment.

X. Uninterruptible Power Supply – 1 Required

1. Rackmount Uninterruptible Power Supply (UPS) shall be Middle Atlantic Products model # UPS-2000-R.

2. UPS shall be line interactive with AVR.

3. Unit shall measure 19.00” W x 3.50” H x 19.00” D and occupy 2 rackspaces.

4. UPS shall have a rear mounting range of 19” to 32” and not require more than one person to mount. Unit shall operate on 120 VAC/60Hz current. Unit shall have a nominal output of 120V.

5. Unit shall have a capacity of 2150 VA and 1650 W.

6. Unit shall have (8) NEMA 5-20R receptacles on the rear of the unit.

7. Unit shall have a priority outlet bank consisting of 4 outlets dedicated to ensure maximum run time of critical components. Unit shall have a non-critical outlet bank consisting of 4 outlets dedicated to load shedding, or individual outlet control, depending on model.

8. Rackmount UPS shall include a 9’ 12/3 SignalSAFE™ power cord with NEMA 5-20R plug.

9. UPS shall have surge suppression that utilizes a clean line-to-neutral design that does not pass noise contamination to ground.

10. Rackmount UPS shall be RoHS EU Directive 2002/95/EC compliant.

11. Rackmount UPS shall be warrantied to be free from defects in materials and workmanship under normal use and conditions for a period of 3 years; battery shall be warrantied for a period of 2 years.

12. Rackmount UPS shall be UL listed in US and Canada.

Y. Programming

1. System shall be fully programmed and tested upon final inspection of equipment.

2. Classrooms with numerical numbering, i.e. 100, 101, 102, shall be architecturally programmed into system. Classrooms with names, i.e. Principal, Nurse, Guidance, shall be assigned consecutive numerical numbers, i.e. 801, 802, 803. These numbers shall be documented and a user guide card generated.

3. User guide card shall list all rooms that do not numerically correspond to a room.

4. These cards shall be produced by successful sound system supplier; one card for every dial telephone. This card shall also include simple operations, i.e. how to call another room, how to make all call announcements, how to make emergency announcements, how to camp on, and other features which include zone paging groups, how to turn bell schedules on and off. If system has dial telephones in classrooms, the same card will be produced with classroom function instruction only, i.e. how to call main office, how to call another classroom, how to call administrator.

5. Successful sound contractor shall obtain from the school its current bell schedule. This bell schedule shall be programmed into the system. If the School District has more than one bell schedule, this also must be programmed into the system.

6. The successful sound contractor shall program the administration telephone hot buttons to customer's desired functions, i.e. turn on audio programming, activate a page zone, change or turn on and off bell schedules.

END OF SECTION

DIVISION 16 - ELECTRICAL

SECTION 16720EX – FIRE ALARM SYSTEM – (EXPAND EXISTING SYSTEM)

PART 1 - GENERAL

1.1 SUMMARY

A. Related Documents:

1. Drawings and general provisions of the Subcontract apply to this Section.

2. Review these documents for coordination with additional requirements and information that apply to work under this Section.

B. Section Includes, but not limited to:
1. Conduit and wiring necessary to connect the existing FACP to alarm initiating devices, notification appliances and auxiliary equipment
2. Addressable manual fire alarm stations
3. Addressable analog area smoke detectors
4. Addressable analog duct smoke detectors
5. Addressable analog heat detectors
6. Carbon Monoxide Detectors
7. Connections to sprinkler waterflow alarm switches
8. Connections to sprinkler supervisory switches and tamper switches
9. Audible and visual combination notification appliances
10. Air handling systems shutdown relays
11. Elevator recall/shunt relays (if the building has an elevator)
12. Battery standby

C. Work scope:

1. Work shall include any or all of the following:

a. Removal of existing devices no longer required as a result of demolition activities in the project area, as indicated in the Drawings. Demolition work shall include removal of device(s), the removal or surface mounted or exposed backboxes, or the abandonment of recessed backboxes, and removal of any associated wiring, and raceways rendered obsolete by the demolition. It shall also include any programming required to remove such devices from the system. All removed devices shall be turned over to the Owner, unless otherwise noted.

b. Removal and re-installation of existing devices and/or associated wiring to accommodate new finish work or equipment replacements by others.

c. Re-location of existing devices and/or wiring associated with renovated areas. Work shall include all wiring extensions as per code and manufacturer specifications to serve the device at its new location.

d. Addition of new devices, backboxes and wiring to serve new or renovated areas as shown on the drawings. Included in this work shall be all programming required to integrate the new devices into the system.

2. It is the declared intent of this specification that the end result of the system modifications shall be a complete and operational fire alarm system. Provide all required expansion modules, power supplies, batteries, interfaces, programming, inspections, testing, etc. to achieve the result whether or not shown on the drawings.

3. Maintain existing fire alarm devices affected by Project Work for renovated space, including areas affected by asbestos abatement within existing zones. This would require disconnection, reconnection and commissioning of existing devices during installation of new ceiling systems.

1.2 DEFINITIONS

A. LED: Light-emitting diode.

B. NICET: National Institute for Certification in Engineering Technologies.

1.3 REFERENCES

A. General:

1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.

2. Unless otherwise noted, the edition of the referenced code or standard that is current at the time of the "date of record" for the Work shall be considered the effective code or standard for the duration of the project.

3. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.

4. Refer to specific Division 26 Sections for additional referenced codes and standards:
   ANSI/NFPA 70 - National Electrical Code.
   ANSI - American National Standards Institute.
   ASME A17.1 Safety Code for Elevators and Escalators
   FM - Factory Mutual System.
   NFPA – National Fire Protection Association
   NFPA 72 - National Fire Alarm Code
   UL – Underwriters' Laboratories:

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For fire-alarm system. Include plans, elevations, sections, details, and attachments to other work.

1. Comply with recommendations in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72.

2. Include battery-size calculations for revised service.

3. Include performance parameters and installation details for each detector, verifying that each detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.

4. Include revised riser diagram complete with devices labeled with Project room numbers and device address number.

5. Include floor plans to indicate final device locations and showing address of each addressable device. In addition, indicate applicable candela settings and tap settings of each notification device.

C. General Submittal Requirements:

1. Shop Drawings shall be prepared by persons with the following qualifications:
   a. Trained and certified by manufacturer in fire-alarm system design.
   b. NICET-certified fire-alarm technician, Level III minimum.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," deliver copies to authorities having jurisdiction and include the following:

1. Comply with the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.

2. Provide "Record of Completion Documents" according to NFPA 72 article "Permanent Records" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter.

B. Operational Documentation:

1. Program Software Backup: On magnetic media or compact disk, complete with data files.

2. Device address list.

3. Updated O&M Manual.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Lamps for Strobe Units: Quantity equal to 10 percent of amount installed, but no fewer than 1 unit.

2. Keys and Tools: One extra set for access to locked and tamper-proofed components.

3. Fuses: Two of each type installed in the system.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.

B. Source Limitations for Fire-Alarm System and Components: Obtain fire-alarm system from single source from single manufacturer. Components shall be compatible with, and operate as, an extension of existing system.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. NFPA Certification: Obtain certification according to NFPA 72 by a UL-listed alarm company.

1.8 WARRANTY

A. Provide and submit written warranty, signed by the manufacturer, agreeing to replace/repair, within the warranty period, all equipment with inadequate and/or defective materials and workmanship, including leakage, breakage, improper assembly or failure to perform as required; provided that the manufacturer's instructions for handling, installing protecting and maintaining units have been adhered to during warranty period. Warranty shall include all component replacement costs, including labor and wring for removal and reinstallation. Such warranty shall be required of the installing contractor even if in excess of original manufacturer warranties.

1. Warranty period: One (1) year, beginning upon completion of equipment installation and commissioning.

1.9 PROJECT CONDITIONS

A. The existing fire alarm system shall remain in service throughout the project, except as described below.

B. Interruptions of Existing Fire Alarm service: Coordinate any required shutdowns with Owner to tie in new fire alarm devices. Outages shall only be scheduled during off hours, weekends, holidays etc. when the building is not in use. Include all premium time on bid. Provide any required fire watches.

1. Notify Architect, Construction Manager, Owner no fewer than two-days in advance.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work. The manufacturer's equipment must be listed for use and function with the existing FACP.

2.2 SYSTEMS OPERATIONAL DESCRIPTION

A. Fire-alarm signal initiation shall be by one or more of the following devices as applicable to the facility:

1. Manual stations.
2. Smoke detectors.
3. Duct smoke detectors.
4. Heat Detectors.
5. Beam Detectors.
6. Fire suppression system operation
7. Automatic sprinkler system waterflow device activation.

B. Fire-alarm signal shall initiate the following actions as applicable to the facility. Any operation sent out from the main FACP shall remain as is prior to this project.:

1. Continuously operate alarm notification appliances.
2. Identify alarm at fire-alarm control unit and remote annunciators.
3. Send alarm signal to central monitoring station
4. Release fire and smoke doors held open by magnetic door holders.
5. Shutdown of fans rated 1000cfm or greater.
6. Close smoke dampers in HVAC duct systems.
7. Recall elevator(s) to primary or alternate recall floors.

C. System trouble signal initiation shall be by one or more of the following devices and actions:

1. Open circuits, shorts, and grounds in designated circuits.
2. Loss of primary power at fire-alarm control unit.
3. Ground or a single break in fire-alarm control unit internal circuits.
4. Abnormal ac voltage at fire-alarm control unit.
5. Break in standby battery circuitry.
6. Failure of battery charging.
7. Abnormal position of any switch at fire-alarm control unit.
8. Activation of any Carbon Monoxide Detector.

D. System Trouble and Supervisory Signal Actions: Any operation sent out from the main FACP shall remain as is prior to this project.

1. Annunciate at fire-alarm control unit and remote annunciators. Send trouble / supervisory signal to central monitoring station.
2. For carbon monoxide detector activation – in addition to above, activate local sounder base of the affected device.

2.3 FIRE-ALARM CONTROL UNIT - EXISTING

A. The existing FACP is as shown on the drawings.

B. Circuits:

1. Initiating Device, Notification Appliance, and Signaling Line Circuits: NFPA 72, Class B.
   a. Initiating Device Circuits: Style B.
   b. Notification Appliance Circuits: Style Y.
   c. Signaling Line Circuits: Style 4.
   d. Install no more than 80% addressable devices on each signaling line circuit.
2. Serial Interfaces: Two RS-232 ports for printers.

C. Notification Appliance Circuit: Operation shall remain as is prior to this project. Operation shall sound in a temporal pattern. All visual notification devices shall be synchronized. Provide NAC Extenders as required.

D. Door Controls: Door hold-open devices that are controlled by smoke detectors at doors in smoke barrier walls shall be connected to fire-alarm system.

E. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory.

F. Transmission to Remote Alarm Receiving Station: Maintain existing automatic transmission of alarm, supervisory, and trouble signals to a remote alarm station.

G. Primary Power: Existing primary power shall remain as is, unless otherwise indicated.

H. Secondary Power: Provide battery calculations to verify if the existing batteries are adequate to meet code requirements after system expansion.

2.4 MANUAL FIRE-ALARM BOXES

A. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.

1. Double-action mechanism requiring two actions to initiate an alarm; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
2. Station Reset: Key-operated switch.

3. Indoor Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm. Unless otherwise noted lifting covers shall be non-alarmed. Where alarmed covers are called for, lifting the cover actuates an integral battery-powered audible horn intended to discourage false-alarm operation. Provide STI Stopper II or equal.

4. Design Make: Compatible with and listed for use on the existing system.

2.5 SYSTEM SMOKE DETECTORS

A. General Requirements for System Smoke Detectors:

1. Comply with UL 268; operating at 24-V dc, nominal.

2. Detectors shall match and be of the same manufacturer as the existing smoke detectors on the system.

3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

4. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.

5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.

6. Integral Visual-Indicating Light: LED type indicating detector has operated and power-on status.

7. Remote Control: Unless otherwise indicated, detectors shall be analog-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by fire-alarm control unit.
   a. Rate-of-rise temperature characteristic shall be selectable at fire-alarm control unit for 15 or 20 deg F per minute.
   b. Fixed-temperature sensing shall be independent of rate-of-rise sensing and shall be settable at fire-alarm control unit to operate at 135 or 155 deg F.
   c. Provide multiple levels of detection sensitivity for each sensor.

B. Photoelectric Smoke Detectors:
1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
   a. Primary status.
   b. Device type.
   c. Present average value.
   d. Present sensitivity selected.
   e. Sensor range (normal, dirty, etc.).

C. Duct Smoke Detectors: Photoelectric type complying with UL 268A.

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
   a. Primary status.
   b. Device type.
   c. Present average value.
   d. Present sensitivity selected.
   e. Sensor range (normal, dirty, etc.).
3. Each sensor shall have multiple levels of detection sensitivity.
4. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
5. Relay Fan Shutdown: Rated to interrupt fan motor-control circuit.
6. Each duct sensor shall have a Remote Test Station with an alarm LED and test switch.

2.6 HEAT DETECTORS

A. General Requirements for Heat Detectors: Comply with UL 521.
   1. Temperature sensors shall test for and communicate the sensitivity range of the device.

B. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F or a rate of rise that exceeds 15 deg F per minute unless otherwise indicated.
   1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
   2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

C. Heat Detector, Fixed-Temperature Type: Actuated by temperature that exceeds a fixed temperature of 190 deg F.
   1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
   2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

2.7 CARBON MONOXIDE DETECTORS

A. Listed to UL 2075 for Gas and Vapor Detectors and Sensors

B. The detector shall be equipped with sounder base and trouble relay. The detector base shall be able to mount to a single gang electrical box or direct mount to wall or ceiling.

C. The detector shall provide dual color LED indication which blinks normal, alarm or end-of-life. When sensor supervision is in trouble or end-of-life condition, the detector shall send a trouble signal to the

panel. In alarm mode the red LED shall blink in a Temporal 4 pattern and the sounder will sound in in a Temporal 4 pattern.

D. The detector shall provide a means to test CO entry into the CO sensing cell.

E. Operating voltage shall be 12/24 VDC.

2.8 NOTIFICATION APPLIANCES

A. General Requirements for Notification Appliances: Connected to notification appliance signal circuits, zoned as indicated, equipped for mounting as indicated and with screw terminals for system connections. Where used on an existing system containing addressed notification devices, any new devices shall likewise be addressable as well.

1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated and with screw terminals for system connections.

2. Wall mounted notification appliances shall be red color with white lettering. Ceiling mounted notification appliances shall be white color with red lettering.

B. Horns/Strobe: Unless otherwise required for compatibility with the existing system: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a sound-pressure level of 90 dBA, measured 10 feet from the horn, using the coded signal prescribed in UL 464 test protocol. Match existing system devices

C. Visible Notification Appliances: Unless otherwise required for compatibility with the existing system: Xenon strobe lights comply with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch- high letters on the lens.

1. Rated Light Output:

a. 15/30/75/110 cd, selectable in the field.

2. Mounting: Wall mounted unless otherwise indicated.

3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.

4. Flashing shall be in a temporal pattern, synchronized with other units.

5. Strobe Leads: Factory connected to screw terminals.

6. Mounting Faceplate: Factory finished, red.

7. Match existing system devices.

2.9 MAGNETIC DOOR HOLDERS

A. Magnetic door holders shall be UL Listed, flush or surface mounted in a single gang box, aluminum color.

B. Magnetic door holders shall be low voltage, AC or DC and compatible with the existing fire alarm system.

C. Magnetic door holders shall have a holding force of 25lbf and shall hold the door open while energized. Doors shall be released upon power failure, or de-energized by means or fire alarm-controlled relay or other switch.

D. Provide with all required hardware for complete operation – including adjustable contact plates etc.

2.10 ADDRESSABLE INTERFACE DEVICE

A. Description: Microelectronic monitor module, NRTL listed for use in providing a system address for alarm-initiating devices for wired applications with normally open contacts.

B. Supervised IAM: Match existing system device, or provide compatible device listed for use on the system.

2.11 DEVICE GUARDS

A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, notification device, or other device requiring protection.

B. Factory fabricated and furnished by device manufacturer.

C. Finish: Paint of color to match the protected device.

D. Provide device guards to devices installed in areas subject to physical damage. This shall include, but not limited to, Gymnasiums, Wrestling Rooms, Weight Rooms, Locker Rooms, Shops, Receiving / Loading Areas, Exterior devices.

2.12 FIRE ALARM WIRE AND CABLE

A. Fire Alarm circuits: Install cables in metal J hooks above accessible ceilings and in Wiremold 500 exposed in finished spaces

B. Manufacturers: Subject to fire alarm system manufacturer’s requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Comtran Corp.
   2. Genesis Cable Products; Honeywell International, Inc.
   3. West Penn Wire/CDT; a division of Cable Design Technologies.
   4. General Wire and Cable Requirements: NRTL listed and labeled as complying with NFPA 70, Article 760.

C. Signaling Line Circuits: Twisted, shielded pair, not less than No . 18 AWG size as recommended by system manufacturer.

D. Circuit Integrity Cable: Twisted shielded pair, NFPA 70, Article 760, Classification CI, for power-limited fire alarm signal service Type FPL. NRTL listed and labeled as complying with UL 1424 and UL 2196 for a 2-hour rating.

E. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, 75 deg C, color-coded insulation.

1. Low-Voltage Circuits: No. 16 AWG, minimum.

2. Line-Voltage Circuits: No. 12 AWG, minimum.

3. Multi-conductor Armored Cable: NFPA 70, Type MC, copper conductors, Type TFN/THHN conductor insulation, copper drain wire, copper armor with outer jacket with red identifier stripe, NTRL listed for fire alarm and cable tray installation, plenum rated, and complying with requirements in UL 2196 for a 2-hour rating.

PART 3 - EXECUTION

3.1 FIELD CONDITIONS

A. Prior to installation carefully inspect the installed work of other trades, whether pre-existing or part of this project and verify that such work is complete to the point where the installation of the fire alarm system may properly commence

3.2 EQUIPMENT INSTALLATION

A. General:

1. Comply with NEC, NFPA 72 and manufacturer requirements or installation of fire-alarm equipment.

2. Follow Division 16 Section “Common Work Results for Electrical”, for anchorage requirements.

3. Verify dimensions in the field. Lay out work in the most direct and expeditious manner to avoid interference.

4. Coordinate necessary shutdowns of existing systems by notifying the Construction Manager or Owner’s Representative a minimum of 10 working days before rendering such systems inoperative. Do not render inoperative any system without the prior approval.

5. Coordinate fire alarm detectors and associated equipment with existing ceiling or roof materials, lighting, ductwork, conduit, piping, suspended equipment, structural and other building components.

6. Coordinate installation of fire alarm system with work of other trades. Protect fire alarm equipment with suitable coverings until completion of Project and remove prior to system turnover.

7. Install initiating devices, control panels, audible signals, connections to equipment provided under other divisions, and related work following equipment manufacturers' requirements for a complete and properly functioning system that will perform specified functions.

B. Install wall-mounted equipment, with tops of cabinets not more than 72 inches above the finished floor.

C. Devices and raceways installed in new walls or existing stud walls shall be flush mounted with concealed wiring. Devices installed on existing block wall construction shall be surface mounted.

D. Smoke-Detector Spacing:

1. Comply with NFPA 72, "Smoke-Sensing Fire Detectors" Section in the "Initiating Devices" Chapter, for smoke-detector spacing.

2. Comply with NFPA 72, "Heat-Sensing Fire Detectors" Section in the "Initiating Devices" Chapter, for heat-detector spacing

3. Smooth ceiling spacing shall not exceed 30 feet. Greater spacing in corridors in accordance with NFPA 72 is permitted.

4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Appendix A in NFPA 72.

5. HVAC: Locate detectors not closer than 3 feet from air-supply diffuser or return-air opening.

6. Lighting Fixtures: Locate detectors not closer than 12 inches from any part of a lighting fixture.

E. Duct Smoke Detectors: Comply with NFPA 72. Install sampling tubes so they extend the full width of duct.

F. Visible Alarm-Indicating Devices: Install with lens at no less than 80” and not more than 96” above finished floor or on the ceiling as indicated. Install all devices at the same height unless otherwise indicated.

G. Device Location-Indicating Lights: Locate in public space near the device they monitor.

3.3 PATHWAYS

A. Pathways above recessed ceilings and in non-accessible locations may be routed exposed.

B. Exposed pathways located in finished areas shall be installed in surface metal raceway and in EMT in storage, mechanical and utility spaces.

C. Exposed EMT shall be painted to match adjacent areas.

D. Exposed box covers in non-public areas shall be painted red.

3.4 CONNECTIONS

A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions.

1. Verify that hardware and devices are NRTL listed for use with fire-alarm system in this Section before making connections.

B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 3 feet from the device controlled. Make an addressable confirmation

connection when such feedback is available at the device or system being controlled.

1. Smoke dampers in air ducts of designated air-conditioning duct systems.

3.5 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals.

3.6 FIELD QUALITY CONTROL

A. Field tests shall be witnessed by authorities having jurisdiction (AHJ).

B. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Tests and Inspections:

1. Visual Inspection: Conduct visual inspection prior to testing.

a. Inspection shall be based on completed Record Drawings and system documentation that is required by NFPA 72 in its "Completion Documents, Preparation" Table in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter.

b. Comply with "Visual Inspection Frequencies" Table in the "Inspection" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.

2. System Testing: Comply with "Test Methods" Table in the "Testing" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.

3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.

4. Test audible appliances for the private operating mode according to manufacturer's written instructions.

5. Test visible appliances for the public operating mode according to manufacturer's written instructions.

6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.

D. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.

E. Fire-alarm system will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

3.7 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION

DIVISION 16 – ELECTRICAL

SECTION 16735 – WIRELESS CLOCK SYSTEM

PART 1 - GENERAL

1.01 SUMMARY OF WORK

A. This Section specifies materials and accessories for a wireless clock system.

B. Expand existing wireless clock system.

C. Section Includes:

1. Master clock;
2. Secondary analog clocks (battery operated);

1.02 REFERENCE STANDARDS

A. Federal Communications Division (FCC)

1. Part 15 - Code of Federal Regulations.

B. National Fire Protection Association (NFPA).

1. NFPA 70E, Standard for Electrical safety in the Workplace.

C. Underwriter’s Laboratories (UL).

1.03 ACTION SUBMITTALS

A. Product Data: Submit product data including manufacturer’s literature for clock system materials and accessories, indicating compliance with specified requirements and material characteristics.

1. Submit list on clock system manufacturer’s letterhead of materials and accessories to be incorporated into Work.
2. Include product name.
3. Include preparation instructions and recommendations, installation methods, and storage and handling requirements.
4. Include contact information for manufacturer and their representative for this Project.

B. Shop Drawings: Submit shop drawings with information as follows:

1. Diagram of proposed system showing system platform appliance, communication pathway, and schedule of individual device locations.
2. Indicate integration with the Owner's network and servers. Include line diagram of network relationships.
3. Show system power requirements.

1.04 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Supply maintenance data for clock system for incorporation into manual specified in Section 01700.

B. Record Documentation: In accordance with Section 01700.

1. List materials used in clock system work.
2. Warranty: Submit warranty documents specified.

1.05 QUALITY ASSURANCE

A. Communications and Electronics Subcontractor Quality Assurance:

1. Work experience of [3] years minimum with work similar to work of this Section.
2. Manufacturer's authorization to perform work of this section.

B. Supplier's Accreditation: Use only suppliers accredited by clock system manufacturer.

C. Supplier's Maintenance Requirements:

1. Ensure local supplier has adequate facility for storage of spare parts for clock system.

1.06 DELIVERY STORAGE AND HANDLING

A. Delivery and Acceptance Requirements:

1. Deliver material in accordance with Section 01 61 00 - Common Product Requirements.
2. Deliver materials and accessories in clock system manufacture's original packaging with identification labels intact and to suit project.
3. Ensure clock system materials are not exposed to moisture during delivery.
4. Replace damaged clock system materials.

B. Storage and Handling Requirements: Store materials off ground in dry location and protected from exposure to fumes and harmful weather conditions and at temperature conditions recommended by manufacturer.

1. Store in original packaging until installed.

1.07 WARRANTY

A. Project Warranty: Refer to Contract Conditions for project warranty provisions.

B. Manufacturer's warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and not intended to limit other rights Owner may have under Contract Conditions.

C. Warranty period: 2 years commencing on Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Manufacturer: Sapling Inc., 1633 Republic Rd Huntingdon Valley, PA 19006, Phone: 1-215-322-6063, URL: www.sapling-inc.com.

2.02 SYSTEM REQUIREMENTS

A. Ensure clock system components are designed to operate as a wireless clock system and as part of complete system including "fail-proof" design to ensure power interruption does not cause system failure.

B. Ensure system can work in conjunction with existing wiring.

C. Ensure system synchronizes all clocks and devices to each other.

D. Ensure system does not require FCC licensing.

E. Ensure system uses frequency-hopping technology.

F. Ensure system is capable of correcting clocks immediately upon receipt of wireless signal.

1. Analog and digital clocks automatically correct themselves on receipt of wireless signal.
2. Include built-in closed-loop system in analog clocks capable of allowing clocks to detect position of hands and bring clocks to correct time even if clocks are manually altered.
3. Ensure analog clocks have diagnostic function capable of allowing user to view how long since clock received wireless signal.
4. Ensure analog clocks are capable of functional tests of electronics and gears.

G. Ensure each individual product is bench tested at manufacturer's facility.

1. Random testing is unacceptable.

H. Ensure each product is designed, assembled and tested in the United States of America.

I. Basis of Design: Sapling Inc., Wireless Clock System.

2.03 MASTER CLOCK

A. Master Clock Type 2: To UL and cUL 863.

1. Ensure master clock includes 10 pre-programmed (S)NTP backup addresses.

2. Ensure master clock is capable of receiving (S)NTP time signal via Ethernet.
3. Ensure master clock is capable of receiving digital signals through RS485 connection.
4. Ensure master clock is capable of correcting secondary clocks for Daylight Saving Time
5. Ensure master clock is capable of customizing Daylight Saving Time, in the event of international use or a change in government regulations.
6. Ensure master clock is capable of outputting RS485 signals.
7. Ensure master clock has two clock circuits capable of outputting signals including:

    a. 59 minute correction;
    b. 58 minute correction;
    c. National Time or Rauland correction;
    d. Once a day pulse;
    e. Rauland digital correction.

8. Clock System: Wireless with transmitter to FCC, Part 15.

    a. Transmitter: Capable of transmitting data to SAL wireless analog and SBL wireless digital clocks, and receiving signal from SNTP time server via online signal.
        (i) Ensure transmitter utilizes 915 -928 MHz frequency-hopping technology and is capable of acting as repeater when receiving wired or wireless signal from master clock.

    b. Automatic bi-annual Daylight Savings Time changes.

9. Ensure system is capable of interfacing with GPS, Internet and intranet systems.
10. Allow for programming of master clock through two push button switches on front panel.
11. Ensure master clock is capable of interfacing with both analog and digital secondary clocks.
12. Communications Interface: Ensure master clock system is capable of being programmed remotely through online interface accessible through LAN and compatible with Microsoft Internet Explorer and Mozilla Firefox web browsers.

    a. Ensure interface includes functions as follows:
        (i) Display features;
        (ii) Show IP settings;
        (iii) Show other master clock settings;
        (iv) Set time and date;
        (v) Download or upload master clock settings;
        (vi) Configure e-mail alerts for various instances.

13. Power Requirements: 110 V AC,60 Hz.

    a. Ensure master clock is capable of 10 years battery power backup in event of power failure.
    b. Ten year battery backup for timekeeping.

14. (S)NTP Server: Ensure master clock is capable of acting as (S)NTP server which other devices can point to receive time through (S)NTP protocol. (optional)16. Basis of Design: Sapling Inc., SMA 2000 Series Master Clock.

2.04 SECONDARY CLOCKS

A. Analog Clocks: To UL and cUL 863, designed for wireless system with fully automatic plug and play capability.

1. Ensure secondary clock is capable of receiving wireless signals from master clock.
2. Ensure each secondary clock works as an RF signal repeater, establishing a Mesh Network.

    a. Operation frequency range: 915 - 928 MHz frequency-hopping technology.

3. Clock display: 12 hour white face with black numbers.

    a. Size: Round 12.65 inches outer diameter.

4. Ensure analog secondary clock is capable of receiving Sapling wireless signals every minute for 24 V / 110V model.
5. Materials:

    a. Dial: Polystyrene
    b. Case: Shallow profile, smooth surface ABS
    c. Crystal: Shatter-proof, side-molded, polycarbonate.
    d. Dial: Polystyrene
    e. Case: Shallow profile, ABS.
    f. Crystal: Shatter-proof, side-molded, polycarbonate.

6. Hand tolerance:

    a. Hour and minute hands: ±1/4 minute.
    b. Second hand: ± 1/2 minute.
    c. Hour and minute hands: ± 1/4 minute.
    d. Second hand: ± 1/2 minute.

7. Power Requirements: Battery.
8. Basis of design: Sapling Inc., SAL-2 Series Wireless Round Clock.

2.05 SOURCE QUALITY CONTROL

A. Ensure clock system components and accessories are supplied or approved in writing by single manufacturer.

2.06 PRODUCT SUBSTITUTIONS

A. No substitutions permitted.

PART 3 - EXECUTION

3.01 INSTALLERS

A. Use only installers with 3 years minimum experience with work similar to work of this Section.

B. Ensure all clock system components are installed by single communications and electronics subcontractor.

3.02 EXAMINATION

A. Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for clock system installation in accordance with manufacturer's written recommendations.

1. Visually inspect substrate in presence of Consultant.
2. Ensure surfaces are free of snow, ice, frost, grease and other deleterious materials.
3. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

B. Start of clock system installation indicates installer's acceptance of substrate installation conditions.

3.03 INSTALLATION

A. Install wireless clock system in accordance with manufacturer's written recommendations and in accordance with NFPA 70E.

B. Integrate clock system with Owner's electrical and communications network.

C. Install wiring in accordance with NEC requirements.

D. Conceal wiring except in unfinished spaces and as approved in writing by Consultant.

E. Install clocks only after painting and other finish work is completed in each room.

F. Install clocks and other devices square and plumb.

3.04 SYSTEM STARTUP

A. At completion of installation and before final acceptance, turn on equipment and ensure equipment is operating properly, and clock system devices and components are functioning.

B. Evaluate and test each device in clock system on room-by-room basis using factory-trained technicians.

1. Fix or replace devices which fail test or are functioning incorrectly.

2. Submit evaluation and report showing results of room-by-room tests and overall system compliance within 3 days of testing being carried out.

3.05 DEMONSTRATION AND TRAINING

A. Arrange system demonstration and training session for Owner's operation and maintenance personnel.

1. Allow Owner and Consultant [7] days minimum advance notice before training session.

B. Break down system demonstration and training session into logical segments for Owner's operations and maintenance personnel.

C. Train Owner's maintenance personnel in procedures and schedules involved in operating, troubleshooting, servicing, and preventative maintenance of clock system.

3.06 PROTECTION

A. Protect installed products and accessories from damage during construction.

B. Repair damage to adjacent materials caused by clock system installation.

END OF SECTION

DIVISION 16 - ELECTRICAL

SECTION 16995 – ELECTRICAL SYSTEMS COMMISSIONING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 01800 "General Commissioning Requirements" for related commissioning process requirements and Commissioning responsibilities

1.02 GENERAL DESCRIPTION

A. The Building Owner, has contracted for the services of the Commissioning Authority; the fees of the commissioning firm are the Owners responsibility.

B. Each Contractor shall include all costs in their bid, to support the commissioning process. To provide but not limited to:

1. Attending all commissioning meetings
2. Performing pre-functional tests, recording equipment data and test completion results on CxA furnished checklists
3. Performing functional performance testing as directed by the CxA
4. On site manpower, all tools, ladders, manlifts and expenses required for support of the commissioning process.
5. Digital copies of approved submittal documents, manufacturer’s warranty documents, completed system test forms, completed manufacturer’s startup reports, complete O&M documents.

1.03 ABBREVIATIONS

A. The following are common abbreviations used in the specifications

6. A/E: Architect / Engineer
7. CM: Construction Manager
8. CTR: Prime Contractor(s)
9. Cx: Commissioning
10. CxA: Commissioning Authority
11. CxT: Commissioning Team
12. EC: Electrical Contractor
13. HVAC: Heating, Ventilation and Cooling

1.04 DEFINITIONS

A. A/E Architects and Design Engineers

B. Acceptance Threshold of acceptable work quality or performance specified for a commissioning activity, including, but not limited to, construction checklists, performance tests, performance test demonstrations, commissioning tests and commissioning test demonstrations.

C. Commissioning: A quality-focused process for verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, and tested to comply with Owner's Project Requirements. The requirements specified here are limited to the construction phase commissioning activities.

D. Commissioning Agent (Cx): An Individual Team Member of the CxA

E. Commissioning Authority (CxA): Engaged by Owner, to evaluate Commissioning- Process Work.

1.05 STANDARD AND CORE COMPLIANCE

A. Commissioning will be accomplished to comply with, and in accordance with the requirements of the following:

B. 2015 International Energy Code (IECC) Section C.408 System Commissioning (as adopted by the 2015 New York State Energy Code)

1.06 RESPONSIBILITY

A. Commissioning Authority (CxA):

14. The CxA is not responsible for design concept, design criteria, compliance with codes, design or construction scheduling, cost estimating, or construction management. The CxA may assist with problem solving non-conformance or deficiencies, but ultimately that responsibility resides with the GC and A/E. The primary role of the CxA is to develop and coordinate the execution of the Commissioning Plan, observe and document system performance. Specifically, that systems are functioning in accordance with the documented design intent and in accordance with the Contract Documents.

B. Contractor:

15. The Contractor will provide all manpower, tools and the use of tools to access, start, check-out and functionally test equipment and systems as directed by the CxA

1.07 SYSTEMS TO BE COMMISSIONED

A. Refer to Section 01800 - General Commissioning Requirements.

END OF SECTION 16995

DIVISION 17

SECTION 17010 - TECHNOLOGY IMPLEMENTATION

Part I - GENERAL

1.01 GENERAL NOTES

A. The intent of the specification section is to outline the scope of work products and execution relating to furnishing and installing Network Cabling at the new or remodeled buildings and/or building additions. This includes, but is not limited to Backbone and Horizontal cabling comprised of Copper and Fiber Cabling, and support systems are covered under this document and the Division 16 contractor shall complete as part of their bid and subsequent required design, implementation, service and installation.

B. All work associated with Division 17 and its intent shall be coordinated with all other work as furnished and installed by other trades that may or may not interface, interact or be dependent upon the work herein.

C. The Division 16 contractor shall meet all required deadlines for installation and implementation and shall notify the Architect/Engineer of any difficulty that he or she faces that may alter these deadlines.

D. The Division 16 contractor shall also notify the Architect/Engineer or the Owner’s designated representative of any design discrepancy, site limitation, or configuration, which would prohibit the contractor from a successful and timely installation. Failure to notify these parties shall result in the contractor's sole responsibility for it.

E. The Division 16 contractor shall be solely responsible for ascertaining, determining and subsequently paying the appropriate prevailing wage rates for the work herein. The Architect/Engineer and the Owner will be held harmless from these and any decisions that the contractor reaches that pertain to the contractor's work.

F. The Division 16 contractor shall be responsible for the copper and fiber data cable, cable management and terminations of such as shown on all E/T series drawings.

G. The Division 16 contractor shall be responsible for the data power and surface raceway as shown on all E/T series drawings.

H. All technology power and data wiring shall be performed by the division 16 contractor. All references made to the Division 16 contractor shall mean the electrical contractor.

1.02 PROJECT DESCRIPTION

A. The Network Infrastructure Design is as follows:

- Category 6/6A UTP and STP cabling to the Telephone Stations.

B. Category 6/6A Unshielded Twisted Pair Copper cabling shall be used to connect the workstations to the nearest Telecommunications Closet (TR), Category 6/6A Unshielded Twisted Pair Copper cabling shall be used for the horizontal structured cabling.

1.03 BIDDERS QUALIFICATIONS

A. All prospective Bidders must possess a minimum of five (5) years continuous experience as a firm doing business under the same name, engaged principally as a contractor for the work proposed.

B. All prospective Bidders must maintain an experienced technical and in house organization for the project, and must maintain an office facility with full-time employees in a commercial space.

C. All data wire installers shall be certified CAT 6/6A and Fiber installers, and the contractor shall provide copies of the certifications from manufactures of UTP/STP copper cabling systems and optical fiber cabling systems such as Hitachi Cable of America or equivalent.

D. All systems, equipment or products herein specified shall be provided and installed by an Authorized Factory Installer for this system, equipment or product.

E. All prospective Bidders shall be able to provide the Owner with the appropriate manufacturers warranty and service on the proposed equipment. Structured cable manufacturer’s warranty shall be a minimum of 20 years.

F. All prospective Bidders will maintain a staff of trained, certified technicians for equipment being specified for this project.

G. A minimum of five years experience in the application of specified equipment is required.

H. A list of projects completed within the last year with contact names and telephone numbers is to be provided upon request.

I. All prospective Bidders shall use licensed electricians for any electrical work being performed within this contract.

1.04 CONTRACT SUPERVISION

A. The Division 16 contractor will assign a competent full-time superintendent to the project, and that superintendent shall be maintained on the project for its duration.

1.05 GENERAL PROVISIONS

A. All Division 16 installations shall be performed by an electrical contractor who is certified in the product specified. A copy of certification documents must be submitted with the bid in order for such bid to be valid. The Division 16 contractor is responsible for workmanship and installation practices in accordance with the wiring program specified. At least 30 percent of the copper installation and termination crew must be certified by the manufacturer specified. In addition, at least 10 percent of the optical fiber installation and termination crew must have technicians level of training and must be certified by the manufacturer specified or other approved organizations in Optical Fiber installation and termination practices.

B. All electrical installations shall be performed by a Division 16 electrical contractor possessing a New York State Electrical license.

C. Any specifications that apply to the electrical contractor will be referred to Division 16 specification.

D. Where the word "Provide" is used, it shall be defined as requiring the furnishing and installing of all items indicated complete in all respects and ready for operation unless otherwise specifically noted.

E. The Division 16 contractor shall be responsible for furnishing all labor, superintendence, materials, tools, equipment and sources necessary for the complete installation of all data work for this technology implementation project as shown on the plans and as herein specified.

F. The Clerk of the works or Construction Manager will be assigned to the project by the Owner and will be clearly defined to the contractor before any work commences.

G. It is the intent of this specification and the accompanying plans that the Division 16 contractor provides a data cabling system complete in every respect and ready to operate. All miscellaneous items and accessories required for such installation whether or not such items or accessories are shown on the plans or mentioned in these specifications shall be furnished and installed.

H. Where the words inactive components is used it refers to all network materials such as patch panels, jacks, patch cords, etc. that are passive to the network (Infrastructure).

I. The Division 16 contractor shall, in writing, accompanying his/her bid, report to the Architect/Engineer of any discrepancy or existing condition which would prohibit him/her from performing his/her work to its full extent - a complete and acceptable system.

J. No "Waiver of Responsibility" for inadequate, incomplete, or defective work will be considered or accepted by the Architect/Engineer unless written notice of a difficulty arising from any existing condition is made part of this Contractor's bid.

K. At each location that a new voice/data or audio/video cable is provided two (2) patch cords shall be provided. One (1) for the closet side and one (1)

for the device side. Patch cord lengths and colors shall be coordinated and finalized with the Owner.

1.06 GENERAL SPECIFICATIONS

A. The following Drawings and accompanying specifications are for the sole purpose of providing the Owner with a complete and thorough infrastructure solution.

B. All inactive components such as the cabling, jacks, racks and such are part of this contract and are the responsibility of the Division 16 contractor to supply and install according to industry standards and accompanying specifications.

C. Workstations and any software running within the workstations are outside of this scope and thus not part of this contract.

D. It is the intent of this specification and accompanying DWG's to show an overall network infrastructure design but not a complete detail of all components within the design. It is the responsibility of the Division 16 contractor to provide, install and configure all materials and components in order to have a complete and thorough data network infrastructure system.

E. The Division 16 contractor will provide the specified manufacturer solution for the CAT-6/6A copper cabling in order to provide the Owner with an extended warranty. Alternate manufacturer solutions will be accepted at the discretion of the owner/engineer.

F. The Division 16 contractor will provide the specified manufacturer solution for the fiber cabling in order to provide the Owner with an extended warranty. Alternate manufacturer solutions will be accepted at the discretion of the owner/engineer.

G. Wherever a discrepancy occurs in the specifications or the drawings or between the drawings and the specifications the contractor will accept the architect/engineer's interpretation of such issue(s).

H. Neither the drawings nor the specifications shall take precedence over the other. Where conflict occurs between both, the one with the more stringent standards shall supercede the other.

1.07 MATERIALS

A. All materials, active or inactive, mentioned for this project are described by specific brand names. It is the intent of the architect/engineer to set a performance standard based on the specific brand name mentioned. The contractor may submit any other brand name

just as long as the equipment or materials meet the performance standards as that of the specific brand that the architect/engineer has chosen.

B. It is the responsibility of the contractor to provide, install and configure all materials or equipment mentioned or not mentioned through out this package in order to achieve a complete and thorough structured cabling system as described previously.

C. The cabling system described in this specification is derived from the recommendations made in recognized telecommunications industry standards. The following documents are incorporated by reference:

1. ANSI/TIA 568.0-D, Generic Telecommunications Cabling for Customer Premises
2. ANSI/TIA 568.1-D, Commercial Building Telecommunications Cabling Standard
3. ANSI/TIA-568-C.2 Balanced Twisted-Pair Telecommunications Cabling and Components Standard
4. ANSI/TIA-568C.3 Optical Fiber Cabling Components Standard
5. ANSI/TIA-568C.4 Coaxial cabling Components Standard
6. ANSI/TIA 606B, Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
7. ANSI/TIA 607-C, Commercial Building Grounding/Bounding Re ANSI/TIA 942-A Telecommunications Infrastructure Standard For Data Centers
8. TIA-862-A, Building Automation Systems Cabling Standard
9. ANSI/TIA 569-D, Commercial Building Standard for Telecommunications Pathways and Spaces
10. BICSI - TDMM, Building Industries Consulting Services International, Telecommunications Distribution Methods Manual (TDMM) – 13th Edition
11. National Fire Protection Agency (NFPA – 70), National Electrical Code (NEC) -2017 Edition

D. If this document and any of the documents listed above are in conflict, then the more stringent requirement shall apply. All documents listed are believed to be the most current releases of the documents. The Division 16 contractor has the responsibility to determine and adhere to the most recent release when developing the proposal for installation.

E. This document does not replace any code, either partially or as a whole. The Division 16 contractor must be aware of local codes that may impact this project.

F. It is the responsibility of the Division 16 contractor to notify the architect in writing if there are any conflicts with the materials or products the architect/engineer has specified that will make a complete network system installation impossible or difficult.

1.08 ALTERNATES

A. Although the Owner does not restrict, by use of a brand name or model, it does have certain features, which it deems desirable. The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.

B. Bidders wishing to submit alternate equipment shall submit to the Architect/Engineer the system proposed to provide an equivalent functional alternate to meet specifications. Bidders shall provide all pertinent information including: manufacturer specification sheets, working drawings, shop drawings and a demonstration of the system.

C. Contractors bidding equipment or systems other than those items specified shall submit those items as equivalents or substitutions to those specified on the Bid Proposal Form in the applicable location. Complete specifications and literature describing alternates MUST be attached to the Bid Form on each item bid. Contractors bidding on substituted or equivalent items may be required to provide a sample of same for evaluation.

D. No substitutions will be considered after the Contract award.

1.09 CODES

A. All work included within the specification package and in the drawings shall be governed by the following rules, guidelines, standards and authorities. All documents listed are believed to be the most current:

NEC	National Electric Code 2017 Edition
OSHA	Occupational Safety & Health Administration
ANSI	American National Standards Institute
NFPA	National Fire Protection Association
ASA	American Standards Association
IEEE	Institute of Electrical & Electronics Engineers
NEMA	National Electronics Manufacturers Association
UL	Underwriters' Laboratory
ELT	Electrical Testing Laboratories Inc.
EIA	Electrical Industries Association
TIA	Telecommunications Industries Association
FCC	Federal Communications Commission
ISO	International Standards Organization
BICSI	Building Industry Consulting Service International

B. All equipment or material that is subjected to UL listings shall be properly labeled.

Part II – Scope of Work

2.01 INSTALLATION CHECKLIST

A. The Division 16 contractor shall have the following information in order to install a complete and accurate job:

- The Drawing Set
- The Design Documentation Project Manual.

2.02 WORK INCLUDED

A. All work required to install and configure a complete data network infrastructure system as described previously will be the Division 16 contractors responsibility. The work included under this specification consists of furnishing all labor, equipment, materials/supplies and performing all operations necessary to complete the installation of this structured cabling system in compliance with the specifications and drawings. The Division 16 contractor will provide and install all of the required material to form a complete system whether specifically addressed in the technical specifications or not.

B. The work shall include, but not be limited to the following:

1. Furnish and install a complete telecommunications wiring infrastructure as specified later in this specification package according to industry standards.
2. Furnish, install and terminate all UTP cable.
3. Furnish and install all wall plates, jacks, patch panels and patch cords.
4. Furnish and install all required cabinets and/or racks as required and as indicated.
5. Furnish any other material required to form a complete system.
6. Perform link or channel testing (100% of horizontal and/or backbone links/channels) and certification of all components.
7. Furnish test results of all cabling to the owner on disk and paper format, listed by each closet, then by workstation ID.
8. Adhere and comply with all requirements of specified programs.

C. The Division 16 contractor will provide and install all cabling at the teacher drop locations where applicable. This includes all video and audio jumpers and video and audio patch cables.

D. The Division 16 contractor will terminate all data cabling as specified later in this specification package according to industry standard in specified surface raceway provided and installed by the Division 16 electrical contractor.

E. The Division 16 contractor shall coordinate with the electrical contractor all data drop location setup components as mentioned in specification section 17010 and drawings.

F. The Division 16 contractor will provide and install all specified materials at all specified wire closet locations.

G. The division 16 contractor will be responsible for any damage done to any part of the buildings during the installation of the network wiring.

H. All building penetrations used for the network wiring infrastructure shall be the responsibility of the Division 16 contractor. This includes core drilling and access to any rooms.

I. The electrical contractor will be responsible for the removal and relocation of any smart boards, tack boards, tack strips, etc.

J. The electrical contractor will be responsible for any cutting and trimming that may be required to install specified surface raceway in all data drop locations. The contractor shall be responsible for all patching and painting to restore to original condition.

K. The Division 16 contractor will provide all testing results for the specified equipment and products.

L. The Division 16 contractor will follow all industry standards for the installation of all materials and equipment.

2.03 GUARANTEE/WARRANTY

A. The Division 16 contractor will be able to provide two separate extended warranties for the data cabling being installed, one for the CAT-6/6A copper cable installation and one for the Fiber Optic cable installation.

B. The extended warranty must be backed by the manufacturer and shall be no less than 20 years.

C. If the Division 16 contractor is submitting alternate materials or equipment, the substituted material or equipment shall provide the extended warranty that is required of the system.

D. Any failed network equipment or material shall be the responsibility of the Division 16 contractor and shall be replaced immediately.

E. Besides the extended manufacturer warranty, the Division 16 contractor will provide the Owner with a separate warranty notifying the Owner that all work performed by this contractor or any of his/her subcontractors or anyone the contractor employed for any installation of the network infrastructure for the Owner was done according to the specifications of the project and in accordance with all applicable industry standards. This warranty will guarantee all work against faulty and improper material and workmanship. This warranty shall be no less than 1 year and any other warranties for longer terms that apply to any of the components or materials shall apply.

F. The Division 16 contractor will provide the extended manufacturer's warranty and his/her own personal warranty no longer than 15 days after he/she has stated in writing and the architect or engineer have verified that the full network installation and configuration has been finished and completed.

2.04 WORK SCHEDULING

A. The Division 16 contractor must submit, in writing to the Owner, a schedule of the work that will be performed throughout the project by building. The work schedule shall be submitted for approval to the clerk of the works or construction manager no later than 7 days after the award has been issued.

B. The Division 16 contractor must adjust his/her work schedule and working hours according to the Owner's schedule. It is the responsibility of the contractor to coordinate his/her schedule with that of the Owner.

C. The Division 16 contractor's work will not be allowed to interfere with the Owners daily work schedule unless given direct permission from the clerk of the works or construction manager.

D. The Division 16 contractor will be responsible for cleaning up any debris caused during the installation after each work period (daily).

E. No data cables shall be left exposed at the end of each work period and any equipment specified for the network design shall not be left accessible to the public. The Division 16 contractor must secure all data wiring and network components at the end of the work period.

F. The clerk of the works or construction manager shall perform a visual inspection at the end of the workday in order to determine that the Division 16 contractor is following proper procedures for securing and cleaning the work area.

G. Any drilling that has to be performed must first be cleared with the clerk of the works or construction manager or architect/engineer.

H. Any relocation or removal of any existing equipment such as tables, shelves, file cabinets etc, shall first be cleared with the clerk of the works or construction manager for approval.

I. The Division 16 contractor will replace any ceiling tiles removed during the workday as to not have any exposed wires during the next Owner day.

J. No surface raceway shall be left exposed with data or electrical cables installed.

K. If the Division 16 contractor has to integrate any existing LAN(S) into the new LAN, the contractor has to notify the Owner or the clerk of the works or construction manager of any interruption that might occur during the process. The clerk of the works or construction manager will insure

that all parties are notified, which may be affected by the down time on the existing network in order to achieve a full installation and integration to the new LAN.

L. The Division 16 contractor must notify the clerk of the works or construction manager and architect/engineer of any conditions that might cause a delay in the completion of the project.

M. The Division 16 contractor must coordinate with the clerk of the works or construction manager for a storage location(s).

N. The Owner will not provide a location where the contractor can store his/her equipment. The Division 16 contractor shall provide his/her own storage facilities.

O. The Division 16 contractor will have to coordinate his/her schedule with that of the electrical contractor's since the electrical contractor will be providing and installing the surface raceway at the data drop locations.

2.05 SUBMITTALS

A. With the bid response the Division 16 contractor will submit a list of all the subcontractors that will be involved with the project.

B. With the bid response the Division 16 contractor will submit all cut sheets for all materials and equipment being proposed for installation. This list will be subject to review and approval by the architect.

C. All equipment or material in a material list shall first be approved before any shop drawings can be submitted by the contractor.

D. Before any data cables are pulled, the Division 16 contractor must submit a printed schedule of all data drops locations. The schedule shall indicate the data drop identification and termination location. The engineer or architect must review and approve the pull schedule prior to startup of any work.

E. Shop drawings shall be submitted with sufficient time for the engineer or architect to review drawings.

F. Shop drawings and cut sheets must be submitted for all equipment or material being used for project completion. The cut sheets shall be original catalog or PDF reproduced sheets clearly identifying the item submitted.

2.06 Drawings

A. It shall be understood that the details and drawings provided with the specifications are diagrammatic. They are included to show the intent of the specifications and to aid the Division 16 contractor in bidding the job. This contractor shall make allowance in the bid proposal to cover whatever work is required to comply with the intent of the plans and specifications.

B. The Division 16 contractor shall verify all dimensions and distances at the site and be responsible for their accuracy.

C. Prior to submitting the bid, the Division 16 contractor shall call the attention of the engineer or architect any materials or apparatus the contractor believes to be inadequate and to any necessary items of work omitted.

Part III – Material Specifications

3.01 COPPER NETWORK CABLING

A. Horizontal cabling, cable to the workstation, shall be Category 6/6A Unshielded Twisted Pair, 4 pair, as manufactured by Hitachi Cable of America or equal.

B. Cable must be plenum rated with UL, CMP listing

C. Cable must be 4 pair 23 AWG Solid UTP, FEP primary insulation and a low smoke PVC jacket.

D. The copper cable must be able to handle the following applications

- Gigabit Ethernet/1000 Base-T
- Fast Ethernet/100 Base-T
- Ethernet/10 Base-T
- 155 Mbps ATM
- IEEE 802.3
- IEEE 802.3ab
- IEEE 802.5
- IEEE 802.12
- ISDN
- Voice
- 550MHZ Broadband Video

E. The Category 6 cable shall meet or exceed ANSI/TIA Category 6 requirements for NEXT, Characteristic Impedance, SRL, Attenuation and Delay Skew, PS-NEXT, ELFEXT and PS_ELFEXT.

F. All UTP drops must be certified at 20 degrees C with a length not to exceed 90 meters.

G. All UTP drops must perform within the following parameters at 250 MHz:

Electrical Parameters (@ 250MHz)	**TIA 568-C.2 verified min. std. (additional performance margin guaranteed)**

Insertion Loss	32.8 dB
NEXT	38.3 dB (41.3 dB)
PSNEXT	36.3 dB (39.3 dB)
ACRN	5.5 dB
PSACRN	3.5 dB
ACRF	19.8 dB (22.8 dB)
PSACRF	16.8 dB (19.8 dB)
Return Loss	17.3 dB

1. Termination of the copper cable shall be at an 8-position snap-in modular jack following the T568B pin assignment. All audio/video over CAT 6 cable components shall be terminated using the color code on the back of the modules. The maximum allowable amount of untwisting during cable termination shall be less the ½ inch.

2. As an option, Category 6A cabling shall be considered. This cabling shall meet all of the specifications listed above. In addition to the above, it must support 10G base T;

Electrical Parameters (@ 500 MHz)	**TIA 568-C.2 verified min. std. (additional performance margin guaranteed)**
Insertion Loss	45.3 dB
NEXT	33.8 dB
PSNEXT	31.8 dB
ACRF	13.8 dB
PSACRF	10.8 dB
Return Loss	15.2 dB
PSANEXT	52.0 dB (58.0 dB)
PSAACRF	24.2 dB (30.2 dB)

3.03 MAIN WIRE CLOSET Equipment Room (ER)/REMOTE WIRE CLOSET Telecommunications Room (TR) MATERIALS

A. These materials shall include but not limited to vertical cable management and support for the patch cords at the front of the rack and wire management, support and protection for the horizontal cables inside the legs of the rack.

B. Ladder Rack and Waterfall cable management shall be provided at the top of the rack for all network cable and fiber entering the rack for protection and to maintain proper bend radius and cable support.

C. Wire management shall also be mounted above each patch panel and/or piece of equipment on the rack.

D. The rack shall include mounting brackets for cable tray ladder rack to mount to the top of the rack.

E. Racks shall have EIA hole pattern on front and rear.

F. Rack shall be black in color to match the patch panels and cable management.

3.04 DATA DROP LOCATION AND MATERIAL

A. Refer to Technology Series Drawings for a list of all materials at all data drop locations.

B. All data drop network cable shall be neatly dressed, secured and concealed throughout the installation.

C. The Division 16 contractor shall install the Data Drop network cables with a maximum of 1-meter service loop (slack cable) neatly coiled and secured in ceiling space above at the station location and a 2-meter service loop at the closet end.

Part IV – Detail Specification

4.01 CABLE ROUTING AND INSTALLATION

A. The following guidelines apply to all technology cabling being installed and routed through the hallways, classrooms or any other location where the specified cable will be installed.

B. It is the responsibility of the Division 16 contractor to determine the best possible path for any cable run as long as it follows the network design set forth by the architect/engineer.

C. Wherever possible the Division 16 contractor will route all his/her cable in the cavity created by the drop ceiling, crawl spaces or attic space. All cables shall be plenum rated.

D. Wherever the Division 16 contractor is unable to route cables as mentioned in item C, the contractor shall run cables in architect/engineer approved surface raceway or conduit at a maximum fill capacity of 40%. For any penetrations of conduit or raceway through fire rated partitions, please refer to specification section 16511 for fire stopping requirements.

E. All cabling shall be supported in cable support system such as "J" hooks or any other approved support system. Data cables shall be bundled with plenum rated hook and loop Velcro ties to a snug fit, which does not deform the cable geometry.

F. All network cables shall be secured a minimum of six (6) inches above the ceiling T-bar grid.

G. The Division 16 contractor should maintain TIA/EIA standards which deal with the proximity of communications cabling to high voltage cabling, motors, transformers, fluorescent lighting and ballast's, etc… If these standards can't be met the contractor shall notify the architect/engineer. In addition to the installation standards from BICSI,

H. The Division 16 contractor shall not rest, fasten or support the data cables on; steam pipes, electrical conduit, insulated pipes or sprinkler pipes, ceiling grid supports, water pipes or HVAC ducting.

I. In areas without adequate support structures, the Division 16 contractor shall install "J" hooks or additional ceiling grid hangers on five (5) foot off center secured to a building structure.

J. Strip ties, saddles and J-hooks shall be plenum rated and must be installed as per industry standards.

K. The Division 16 contractor shall not install more than 15 individual data cables to a single hanger or "J" hook without the use of a two-inch wide saddle to eliminate strain on the individual cables.

L. The Division 16 contractor shall be responsible for replacing or patching any system that was damaged during network installation.

M. The Division 16 Contractor will not support any data cables with power cables or fire alarm cables within the same support system.

N. The Division 16 contractor must avoid installing all cable in any location that may cause any obstruction to any existing building functions.

O. If Division 16 contractor chooses to run cables in attic space, he/she must lay cables in J-Hooks or cable trays.

4.02 WALL OR FLOOR PENETRATIONS

A. The Division 16 contractor must notify the clerk of the works or construction manager of any drilling that may be required to install data cables.

B. The Division 16 contractor is responsible for drilling that is not performed by the General Contractor in all locations needed to install specified data wiring.

C. The Division 16 contractor must provide and install all sleeves and conduits that may be necessary for a proper installation of their specified data wire.

D. If necessary, the Division 16 contractor must provide his/her own separate wall or floor penetrations for data wiring. The contractor may not use existing penetrations because existing penetrations may not be sleeved and damage may be caused to existing wires at that location.

E. If conduit is being used the size of conduit must be determined by the number of cables that will be installed within conduit. Conduit fill shall not exceed 40 percent.

F. Conduit shall be installed with the appropriate bend radii to maintain the required bend radius for the Copper and Fiber Optic Cable. Install pull boxes every 100 feet and at every 90 degree turn.

G. It is the responsibility of the contractor to provide fire stopping at all penetrations made by him/her in all fire-rated and time rated walls, floors, ceilings and partition assemblies in accordance with National Electric Code.

H. The Division 16 contractor shall provide the Owner with a fire stopping system, installed to resist the spread of fire and the passage of smoke and other gases.

I. The fire stopping material shall be approved and tested by U.L. or other qualified and approved inspection agency for the designated fire resistance rating.

J. The fire stopping material shall contain no detectable asbestos and comply with all local regulations.

4.03 TELECOMMUNICATIONS ROOM (TR) INSTALLATION

A. Refer to Technology Drawings for a list of materials at all wire closet locations.

B. Wall mounted termination shall be mounted on 4’ x 8’ x .75” void free, fire resistant plywood. The plywood shall be mounted vertically 12” above the finished floor. The plywood shall be painted with two coats of white fire retardant paint.

C. The network cables shall be dressed and terminated in accordance with the recommendations made in the TIA/EIA-568-B standard and best industry practices.

D. Each cable shall be clearly labeled on the cable jacket behind the patch panel at a location that can be viewed without removing the bundle support ties. Cables labeled within the bundle, where the label is obscured from view shall not be acceptable.

E. Cables shall be neatly bundled and dressed to their respective panels. Each panel shall be fed by an individual bundle separated and dressed back to the point of cable entrance into the rack or frame.

F. All cables shall be routed through a cable support system, ladder rack and waterfall cable management shall be provided at the top of the rack for all network cable and fiber entering the rack for protection and to maintain proper bend radius and cable support.

G. Racks and patch panels shall be labeled to identify the location within the cable system infrastructure. All labeling information shall be recorded on the as-built drawings and all test documents shall reflect the appropriate labeling scheme.

H. Racks shall have EIA hole pattern on front and rear.

I. The Division 16 contractor must provide 20 percent spare ports in Category 6/6A and Fiber patch panels for future use.

J. Any cables leaving or entering the wire rack shall be neatly bundled and encased in approved cable management system.

4.04 DATA/TELEPHONE VOIP DROP LOCATION INSTALLATION

A. The Division 16 Electrical Contractor will provide and install all raceway, divider, power, receptacles and faceplates within the Data Drop Location except for the Category 6 Modular Jacks (refer to E/T series drawings).

B. All materials that will be mentioned in this section have been identified and specified earlier in this specification package under Part III.

C. Refer to Technology Drawings for a complete list of materials at all data drop locations.

D. The Division 16 Electrical contractor will install dual surface raceway in specified locations. Electrical contractor will provide and install divider wall within surface raceway. Divider wall must run continuously throughout surface raceway.

E. All surface raceway shall be mechanically anchored with appropriate fasteners.

F. Electrical contractor must terminate metal jacket of power cable/conduit properly at entrance of surface raceway.

G. All data drops shall be spaced 3’ on center. The Division 16 contractor shall notify the clerk of the works or construction manager if this setup is not possible and then contractor shall space out data drops evenly about the length of surface raceway that can be installed.

H. The Division 16 contractor will install CAT-6/6A copper cable within surface raceway and terminate it in front loading Enhanced CAT-6 modular jacks following T568B standards. Modular jacks shall be installed in snap in faceplates which will be installed in specified molded covers.

I. The Division 16 Electrical contractor is responsible for all branch circuits, receptacles and hanging device brackets if specified (refer to E/T series drawings).

J. Electrical contractor will supply and install all accessories as required for a complete installation of surface raceway (refer to E/T series drawings).

K. Cable shall be labeled at each end.

L. All label printing will be machine generated using indelible ink ribbons or cartridges. Self-laminating labels will be used on cable jackets, appropriately sized to the OD of the cable, and placed within view at the termination point on each end. Outlet, patch panel and wiring block labels shall be installed on, or in, the space provided on the device.

M. The Division 16 contractor shall coordinate with the architect/engineer any surface raceway configuration changes caused by any obstacles and or casework locations.

N. Cutting and notching of any ornamental trimming will be the Division 16 electrical contractor's responsibility. The electrical contractor must notify the clerk of the works or construction manager if any cutting for proper installation has to take place.

O. Electrical contractor shall notify the clerk of the works or construction manager if installation of surface raceway is impossible at any specified location.

P. Electrical contractor shall notify the clerk of the works or construction manager if installing a different setup than that which has been specified.

Part V – Project Close-out

5.01 GENERAL PROVISIONS FOR TESTING

A. Before final application is considered for review the Division 16 contractor must submit all test results to the architect/engineer in order for them to be reviewed and accepted.

B. The clerk of the works or construction manager can be present during such testing and will be able to inspect contractor installation and workman-ship.

C. Any work that does not comply with specifications mentioned throughout this specification package or industry standard shall be replaced and reinstalled at contractor's expense.

D. Certificate of compliance and all test results shall be provided to the Owner upon each item of testing.

E. Any failed copper cables or fiber optic cables shall be removed and re-installed. If a fiber strand fails out of the full fiber optic cable bundle then the contractor will denote that fiber strand and remove it from any termination equipment. Data contractor will then replace that failed # of strands.

F. Electrical Contractor shall submit written test reports for all types of cables and on each individual cable. All individual test reports shall be bound into a booklet form. Electrical Contractor shall submit (1) paper copy of final testing report to Architect/Engineer and all data on CD. For multiple buildings provide (1) copy for each building involved in the project.

G. Prior to the start of work, Electrical Contractor shall submit test booklet format and blank test report forms for Engineer approval.

H. Report booklet shall include final riser diagrams with cable identification numbers.

I. Provide cover sheet per building including all nodes and associated test results. Cover sheet shall include Building Name, Wiring Closet Number, Type of Cable, Room Number, Room Name, Result (Pass or Fail), Length, etc.

5.02 Category 6/6A COPPER CABLE TESTING

A. Category 6 copper cable shall meet all manufacturing standards and all ANSI/TIA 568C.2 standards for attenuation, Propagation Delay, Delay Skew, NEXT, PSNEXT ELFEXT PSELFEXT and return loss.

B. A field tester meeting the requirements set forth in the 568C.2 standard and use the latest version of the Fluke tester or an equivalent.

C. All cabling testing shall be done at not only all points of connectivity to the network, but also at each cable for any breaks or damage to ensure connectivity and compliance with the network and EIA/TIA standards.

D. The testing certification sheets shall be made part of the required "Close-out" documentation. Testing sheets shall include wire map, resistance, length, capacities, Attenuation, NEXT, Propagation Delay, Delay Skew, Return Loss, PSNEXT.ELFEXT and PSELFEXT for installed cable. Cable results of the pass results must be submitted in an electronic and paper format. It must be the full tests results from the tester in its native format. * Pass is NOT acceptable.

5.03 FIBER OPTIC CABLE TESTING

A. The Division 16 contractor shall test all optical fiber cable before installing it. A visual continuity test shall be enough.

B. The Division 16 contractor shall use LAN test equipment such as Fluke or equivalent for all installed fiber optic cabling. This testing documentation shall be completed per the ANSI/TIA 568C.3 requirements and be made part of the required "Close-out" documentation. The tested cable shall also be certified to support the required protocols for selected network applications.

C. For complete and accurate testing for fiber optic cables the Division 16 contractor shall follow the following guidelines:

- Confirm test jumpers are of the same fiber core size and connector type as the cable system.
- Ensure that optical sources are stabilized and have center wavelengths within +-20 nm of the 850/1300 nm wavelength.
- Test set-up and performance shall be conducted in accordance with ANSI/TIA 568C.3 standards.
- Power meter is calibrated at each of the nominal test wavelengths and traceable to the National Institute of Standards and Technology (NIST)
- Contractor must confirm all system connectors, adapters, and jumpers are properly cleaned prior to the measurement.
- System loss measurements shall be provided at 850 and/or 1300 nanometers for multimode fibers and 1310 and/or 1550 for singlemode fibers.
- Division 16 contractor will be testing for end-to-end attenuation. The attenuation shall not exceed manufacturer's specifications and verified by ETL to ANSI/TIA 568C.3 specifications.

D. The Division 16 contractor must measure the attenuation of each connected link after each installation.

E. If attenuation level results are not acceptable, the contractor must perform OTDR testing on failed cable in order to find out what causes the loss and where it occurs in the cable. The contractor will make appropriate adjustments or reinstallation of the cable in order for the cable to pass attenuation level results.

5.04 AS BUILT DRAWINGS

A. The Division 16 contractor must provide the architect/engineer with as built drawings in an electronic format compatible to AUTOCAD. No hand-generated drawings shall be acceptable. A paper set and an electronic set shall be provided to the Owner.

B. The Division 16 contractor may acquire the background drawings from the architect/engineer upon request. Contractor's drawings can only be used for this project and may not be altered to perform any other work at this Owner's site. A Twenty Five dollar ($25) per drawing fee will be charged for every AutoCAD drawing requested.

C. The Division 16 contractor must fill out data information charts and turn them over to the Owner. Information charts must be reproduced in written format as well as electronic format.

5.05 SYSTEM WARRANTY, GUARANTEES, AND MANUALS

A. The Division 16 contractor will provide all system and product guarantees as mentioned in section 2.03 to the Owner no later than 10 days after the contractor has submitted in writing of project completion.

B. The Division 16 contractor will provide the Owner all manufacturer manuals for all the installed equipment. Manuals should be clearly labeled and must be provided in some sort of binder or folder for storage purposes.

END OF SECTION

DIVISION 17 – TECHNOLOGY

SECTION 17020 – NETWORK EQUIPMENT
PART 1 - GENERAL

1.01 GENERAL NOTES

A. The intent of the specification section is to outline the scope of work that the network contractor shall complete as part of their bid and subsequent required design, implementation, service, and installation.

B. All work associated with this contract and its intent shall be coordinated with all other work as furnished and installed by other trades that may or may not interface, interact, or be dependent upon the work herein.

C. The network contractor shall meet all required deadlines for installation and implementation and shall notify the design engineer of any difficulty that he or she faces that may alter these deadlines.

D. The network contractor shall also notify the engineer or the School District's designated representative of any design discrepancy, site limitation, or configuration which would prohibit the network contractor from a successful and timely installation. Failure to notify these parties shall result in the network contractor's sole responsibility for it.

E. The network contractor shall be solely responsible for ascertaining, determining, and subsequently paying the appropriate prevailing wage rates for the work herein. The design engineer and the school District will be held harmless from these and any decisions that the network contractor reaches that pertain to the network contractor's work.

1.02 PROJECT DESCRIPTION

A. The following specifications are for the installation of network equipment and services for the North Babylon Union Free School District.

1.03 Bidders Qualifications

A. All prospective bidders must be certified installers for all equipment listed.

B. All prospective bidders must possess a minimum of five (5) years continuous experience as a firm doing business under the same name, engaged principally as a network contractor for the work proposed.

C. All prospective bidders must maintain an experienced technical and in house organization for the project, and must maintain an office facility with full-time employees in a commercial space.

D. All prospective bidders shall be able to provide the District with the appropriate manufacturers warranty and service on the proposed equipment.

E. All prospective Bidders will maintain a staff of trained, certified technicians for equipment being specified for said job.

F. A list of projects completed within the last year with contact names and telephone numbers is to be provided.

1.04 CONTRACT SUPERVISION

A. The Division 16 contractor will assign a competent project manager that will be responsible for the project.

B. The District reserves the right to request a change of project managers if the original project manager does not perform to Districts standards.

1.05 GENERAL PROVISIONS

A. All network installations and configurations shall be performed by a network contractor who is certified in this field. This network contractor shall be referred to as the "Network contractor" for the remainder of this specification.

B. Where the word "Provide, is used, it shall be defined as requiring the furnishing and installing of all items indicated, complete in all respects and ready for operation unless otherwise specifically noted.

C. The network contractor shall be responsible for furnishing all labor, superintendence, materials, tools, equipment and sources necessary for the complete installation of all work for this district-wide technology implementation as shown on the plans and as herein specified.

D. The term "district, referred to within this specification package refers to the Shoreham-Wading River Central School District.

E. It is the intent of these specification and the accompanying plans that the network contractor provides a system complete in every respect and ready to operate. All miscellaneous items and accessories required for such installation whether or not each such item or accessory is shown on the plans or mentioned in these specifications shall be furnished and installed.

F. Where the word active components is used it refers to all network equipment such as switches, routers, and modems that process data traffic.

1.06 VERIFYING EXISTING CONDITIONS

A. The network contractor shall, prior to submitting his/her bid, examine all the existing site (s) /building (s), etc. that are in any way dependent upon the work herein.

B. The network contractor shall, in writing, accompanying his/her bid, report to the engineer of any discrepancy or existing condition which would prohibit him/her from performing his/her work to its full extent - a complete and acceptable project.

C. No "Waiver of Responsibility" for inadequate, incomplete, or defective work will be considered or accepted by the Engineer unless written notice of a difficulty arising from any existing condition is made part of this network contractor's bid.

1.07 GENERAL SPECIFICATIONS

A. The following specifications are for the sole purpose of providing the District with a complete and thorough Local Area Network with Internet connectivity.

B. All active components such as switches and routers are part of this contract and thus the network contractor will install and configure such equipment.

C. All inactive components such as the cabling, jacks, racks, surface raceway and such are part of this contract and thus is the responsibility of the Division contractor to supply and install such.

D. Workstations and any software running within the workstations **are outside of this scope and thus not part of this contract.**

E. Wherever a discrepancy occurs in the specifications or the drawings or between the drawings and the specifications the network contractor will accept the engineer's interpretation of such issue(s).

1.08 MATERIALS

A. The Network Contractor will supply a list of materials for each school. The list of equipment that shall be provided and configured, must be defined by the school and closet location.

B. All active component material should include ten percent additional ports for closet’s up to 100 drops, five percent for closets 101 to 300 drops, and 2.5 percent for closets over 301 drops.

C. It is the responsibility of the network contractor to provide, install and configure all materials or equipment mentioned or not mentioned through out this package in order to achieve a complete and thorough network solution as described previously.

E. It is the responsibility of the network contractor to notify the engineer in writing if there are any conflicts with the materials or products the engineer has specified that will make a complete network system installation impossible or difficult.

Part II - Scope of Work

2.01 INSTALLATION CHECKLIST

A. The Network contractor shall have the following information in order to install a complete and accurate job:

- The Design Documentation Project Manual.

2.02 WORK INCLUDED

A. The network contractor shall provide and install all specified equipment. Installation of such equipment includes the racking and stacking of all switches and routers.

B. The network contractor must configure all specified equipment.

C. District requirements such as VLANS, IP Addressing, Security etc. shall be discussed and documented with the network contractor prior to the submittal.

D. It is the responsibility of the network contractor to obtain the most recent patches, builds, drivers and upgrades, for all active networking components. These devices will be upgraded, flashed and configure to the most recent set of available standards prior to turning the system over for District use.

E. The network contractor must supply network management software, which will recognize all new equipment, and existing District equipment.

F. Network contractor will be responsible for providing and installing all specified patch cables at the wire closet.

2.03 GUARANTEE/WARRANTY

A. The network contractor will be able to provide manufacturers warranty to the District.

B. Any failed equipment of material shall be the responsibility of the network contractor and shall be replaced immediately.

2.04 WORK SCHEDULING

A. The network contractor must submit, in writing to the school, a schedule of the work that will be performed throughout the School District, indexed by building.

B. The network contractor must adjust his/her work schedule and working hours according to the schools schedule. It is the responsibility of the network contractor to coordinate his schedule with that of the schools.

C. The network contractor's work will not be allowed to interfere with the schools daily work schedule unless given direct permission from the District.

D. The network contractor will be responsible for cleaning up any debris caused during the installation after each work period (daily).

E. The network contractor must secure all network active components at the end of the work period.

F. The assigned District personnel shall perform a visual inspection at the end of the workday in order to determine that the network contractor is following proper procedures.

G. Network Contractor must notify the District if they will be removing any existing network equipment.

H. The network contractor must notify assigned District personnel of any conditions that might cause a delay in the completion of the project.

I. The network contractor must coordinate with assigned District personnel for a storage location(s)at the site.

Part III - Material Specifications

3.01 ACTIVE COMPONENTS

A. The equipment list of all materials, such as switches, router and associated materials, will be supplied to the District for approval.

3.02 PATCH CABLES

A. Network contractor must provide all Category 6 patch cables at all wire closets.

Part IV - Detail Specification

N/A

Part V - Project Close-out

5.01 GENERAL PROVISIONS FOR TESTING

A. Before final application is considered for review the network contractor must submit all test results to the District in order for them to be reviewed and accepted.

B. The District assigned personnel can be present during such testing and will be able to inspect network contractor installation and workmanship.

C. Any work that does not comply with specifications mentioned throughout this specification package or industry standard shall be replaced and reinstalled at network contractor's expense.

5.02 SYSTEM WARRANTY, GUARANTEES AND MANUALS

A. Data network contractor will provide all system and product guarantees as mentioned to the District no later than 10 days after network contractor has submitted in writing of project completion.

B. Network contractor must notify District personnel of how guarantees and warrantees should be handled and network contractor must fill out all the warranty cards for all the active components for the District.

C. Network contractor will provide the District all manufacturer manuals for all the installed equipment. Manuals should be clearly labeled and must be provided in some sort of binder or folder for storage purposes.

D. All documentation, software, license agreements, etc. shall be turned over to the Owner upon completion of the project.

END OF SECTION