

PROJECT MANUAL

BBS

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LANDSCAPE ARCHITECTS
ENGINEERS

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FOR:

PHASE 1 BOND IMPROVEMENTS

at

**Briarcliff Manor MS/HS
Todd Elementary School**

Briarcliff Manor UF SCHOOL DISTRICT
Village of Briarcliff Manor, Westchester County

**NEW YORK STATE EDUCATION
DEPARTMENT NUMBER:**

S.E.D. No. 66-14-02-02-0-004-022 (MSHS)
66-14-02-02-0-002-020 (ES)

B.B.S. PROJECT NUMBER:

21-274a (HSMS)
21-274b (ES)

DATE:

Issue for Bid Date: January 28, 2022

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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(Not Applicable)

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(Not Applicable)

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(Not Applicable)

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(Not Applicable)

PROJECT DIRECTORY

Architects/Engineers:	BBS Architects, Landscape Architects and Engineers, P.C. 187 Wolf Road - suite 205 Albany, NY 12205 (518) 621-7650
Superintendent of Schools:	Dr. James Kaishain Superintendent of Schools 45 Ingham Road, Briarcliff Manor 10510 (914) 432-8116
Business Official:	John Brucato Asst. Supt. of Finance & Operations 45 Ingham Road, Briarcliff Manor 10510 (914) 432-8116
Director of Facilities	George Hula 45 Ingham Road, Briarcliff Manor 10510 (914) 432-8112
Construction Manager:	Savin Engineers Bob Firneis 3 Campus Drive, Pleasantville, NY 10570 (914) - 769-3200

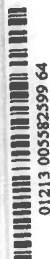
STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE



FREDERICK W SEEBA
CLASS(EXPIRES)
I PD (04/21)

CERT# 90-01178
DMVA 166385801

MUST BE CARRIED ON ASBESTOS PROJECTS



01213 005582599 64

EYES HAZ
HAIR BRO
HGT 6' 00"

IF FOUND RETURN TO:
NYSOL - L&C UNIT
ROOM 161A BUILDING 12
STATE OFFICE CAMPUS
ALBANY NY 12240

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: 02/19/2021

EXPIRATION DATE: 02/28/2022

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

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
Briarcliff Manor Union Free School District**

PUBLIC NOTICE: is hereby given for separate sealed bids for: **Phase 1 Bond Improvements at Briarcliff Manor MS/HS and Todd Elementary School**. Bids will be received by the School District, on **Thursday February 17, 2022 at 1:00 P.M. in the District Office - 45 Ingham Road, Briarcliff Manor, New York, 10510**, 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, 12205 (518-621-7650)**; however the Contract Documents may only be obtained thru the Office of **REV, 330 Route 17A Suit #2, Goshen New York 10924 (877-272-0216)** on **January 28, 2022**. 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, BRIARCLIFF MANOR UNION FREE 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.

BY ORDER OF THE
BOARD OF EDUCATION
Briarcliff Union Free School District
Dated: January 25, 2022

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19. Condition of Work Operations
20. Required Bid Information

1. DOCUMENTS (ISSUANCE AND RESTRICTIONS)

- A. Bid documents may be examined at the applicable office of the Architect, BBS Architects, Landscape Architects & Engineers, P.C., 244 East Main Street, Patchogue New York or 187 Wolf Road, Albany New York between the hours of 9 a.m. and 4 p.m. daily except Saturdays, Sundays, and holidays.
- B. A deposit, refundable in accordance with the Invitation to Bidders, is required for each set of Bid Documents.
- C. Bid documents are comprised of all bid-related documents including, but not limited to, the Invitation to Bidders, Instructions to Bidders, Supplementary Information to Bidders, if any, Bid Proposal Forms, Addenda issued prior to the bid date, and the Contract Documents. Contract Documents consist of the form of Agreement between the Owner and the Contractor, other documents enumerated in the Agreement between the Owner and the Contractor ("the Agreement"), Conditions of the Contract (General, Supplementary and other conditions or provisions), Drawings, Specifications and all addenda issued prior to execution of the Contract and modifications issued after execution of the Contract.

2. QUALIFICATIONS OF BIDDERS

A Bidder must present information and/or documentation proving that:

- A. It has the financial capability to produce and execute the project within the time periods specified;

- B. It possesses a minimum of five years continuous experience as a firm doing business under the same name, engaged principally as a contractor for the Work proposed.
- C. It has completed at least five similar projects, listing type and scope of work, names and addresses of owners and dates of Contract completion (the Owner has the right to verify the documentation as well as examine other aspects of the Bidder's work record);
- D. It can provide tabulation of equipment and facilities at its disposal to do the proposed Work;
- E. It has a current bonding capacity to accommodate proposed Work
- F. It has the experienced staff and technical organization necessary for the Project;
- G. It maintains an office with full-time employees in a commercial space;
- H. It intends to complete at least 25 percent of the Work with its own forces (General Conditions, Mobilization, etc. will not count toward the 25 percent;
- I. It is not currently involved in bankruptcy proceedings;
- J. It is licensed to perform the Work it is bidding on in the jurisdiction the Work will take place; and
- K. It has the insurance required by the Contract Documents to protect the Owner or is able to obtain the required insurance.
- L. The Bidder must provide a complete Schedule of Values on an AIA form G703. This Schedule must be revised and resubmitted until satisfactory to the Architect. All project phases, activities and work items must be broken out individually with lines for both labor and materials. In addition to this and to the required retainage, the Schedule of Values must be structured with the following values:

General Conditions:	5% of overall contract value
Bonds and Insurance:	4% of overall contract value
Submittals:	1% of overall contract value
Punch List:	3% of overall contract value
Commissioning (if applicable):	TBD based on specific project
Closeout and O&M Manual:	2% of overall contract value
- M. The Bidder is required to complete and submit the "Statement/Proof of Bidder's Qualifications" form contained herein.
- N. It is assumed that in preparing this bid, the Bidder has already compiled this information, and that it is being made available for reference with completing this package. All information contained above must be submitted to the Architect prior to award of the Contract. Failure to provide this information may result in disqualification of the Bidder.

3. COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS

- A. Bidder must comply with applicable federal, state, and local laws as well as all ordinances, rules, and regulations affecting the Work.
- B. The provisions of General Municipal Law, Section 103A, as it relates to refusal to testify or sign a waiver of immunity against prosecution and the submittal of bids and transactions with the State of New York, or a political subdivision thereof, governs work under this contract.
- C. Wage rates as determined by the New York State Department of Labor pursuant to the labor laws of the State of New York apply to all Work under this Contract.
- D. In accordance with the requirements of General Municipal Law § 103-g, the Bidder is required to include with its bid either (1) the 'Certification of Compliance with the Iran Divestment Act' or (2) the form entitled "Declaration of Bidder's Inability to Provide Certification of Compliance with the Iran Divestment Act."

4. SINGLE PRIME CONTRACTS **(NOT APPLICABLE)**

- A. Where the project cost does not exceed \$1,500,000 and the Owner has decided to solicit bids from one general contractor, the Bidder must submit with its bid a separate sealed list that names each subcontractor that the Bidder will use to perform Work on the Contract, and the agreed-upon amount to be paid to each, for: (A) plumbing and gas fitting; (B) steam heating, hot water heating, ventilating and air condition apparatus and (C) electric wiring and standard illuminating fixtures.

After the low bid is announced, the sealed list of subcontractors submitted with the low bid will be opened and the names of the subcontractors will be announced, and thereafter any change of subcontractor or agreed-upon amount to be paid to each will require the approval of the Owner, upon a showing presented to the Owner of legitimate construction need for the change, which will be open to public inspection. Legitimate construction need includes, but is not limited to, a change in project specifications, a change in material costs, a change to subcontractor status as determined pursuant to New York Labor Law § 222(2)(e), or the subcontractor has become otherwise unwilling, unable or unavailable to perform the subcontract. The sealed list of subcontractors submitted by all other bidders will be returned to them unopened after the Contract award.

5. EXAMINATION OF DOCUMENTS AND SITE

- A. Bidder must visit sites of proposed Work and be fully familiarized with conditions as they exist, as well as the character of the operations to be carried on under the proposed Contract.

- B. Bidder must make all necessary on-site investigations so as to understand facilities, difficulties, and restrictions attending the execution of the Work including access to and conditions of the Work sites and properties.
- C. A Bidder will be presumed to have visited the site prior to submission of a proposal and to have familiarized itself with surface and subsurface conditions, existing structures and any and all conditions that may in any way affect the Work. Failure to have so acted will in no way relieve a Bidder from its obligation to perform the proposed Work for the consideration set forth in its bid.
- D. At the time of the opening of bids, each Bidder will be presumed to have read and to be thoroughly familiar with the Drawings and Contract Documents, including all addenda. The failure or omission of any Bidder to receive or examine any form, instrument or document will in no way waive relieve any Bidder from its obligation to perform the proposed Work for the consideration set forth in its bid.
- E. If, prior to the submission of its bid, a Bidder fails to notify the Architect in writing of the existence of any condition, ambiguity, inconsistency or error in any of the Contract Documents, or to a conflict between provisions in any Contract Document and provisions of applicable laws, regulations, ordinances, or codes, its bid will be conclusively presumed to have been based upon the interpretation of the ambiguity or inconsistency, or the directions correcting the error or conflict which may subsequently be given by the Architect.

6. AMBIGUITIES, INTERPRETATIONS, AND ADDENDA

- A. No oral interpretations, instructions, or explanations of the Bid Documents will be given prior to the opening of the bids. Discrepancies, ambiguities, or doubts as to the intent of a Bid Document should be communicated to the Architect in writing for interpretation.
- B. Interpretations of, clarifications of, amendments to or corrections to the Bid Documents will be made in writing in the form of addenda forwarded to each person to whom or each entity to which Bid Documents have been issued and will become part of the Bid Documents. Each Bidder must acknowledge receipt on the Bid Proposal Forms. Replies issued in any other manner will not be binding. The Architect will not be responsible for oral clarifications.

7. PRE-BID CONFERENCE

- A. When indicated in the Invitation to Bidders, a pre-bid conference will be held, at which time the Architect will have a representative available to respond to questions regarding the Bid Documents.
- B. Addenda clarifying pertinent questions or concerns raised at the pre-bid conference, requiring modification of the Bid Documents, will be issued for the record and become part of the Bid Documents.

- C. Notice as to the time and place of the pre-bid conference is stated in the Invitation to Bidders.

8. BASIS OF BID - PERFORMANCE AND QUALITY STANDARDS

- A. GENERAL: To establish performance and quality standards for the products, materials, and equipment required in the Work, the Contract Documents detail performance criteria, or specify two or more items or materials which are presumed to be equal. This method of establishing a level of quality is not intended to exclude products that are equivalent in quality, performance, appearance, and function to those specified.

- B. EQUIVALENTS: The Bidder may propose to use in the Work an equivalent item in lieu of that specified with NO CHANGE to the Bid Amount. The Bidder, proposing to utilize this equivalent procedure, must provide a detailed descriptive submission of the proposed material, equipment, or method being offered as equal to those specified, including an explanation of all deviations from the product specified in the Contract Documents. The Bidder is responsible to prove equality and, in that regard, must supply all additional information requested by the Architect, as well as pay for any required testing to support these claims. Further, the Architect is to be the sole judge of product equivalency for the purpose intended, considering equality, workmanship, aesthetics, services, maintenance, economy, and reliability of operation.

If the Bidder has used equivalents as the basis of the bid, the "Proposed Equivalent Form", which is included in the Project Manual following the Bid Proposal Form, must be submitted as an attachment to the Bid Form or within 72 hours after the bid or prior to the award of the Contract. This form may be reproduced, if necessary, for a full listing of equivalents to be considered. This does not exclude the Bidder from submitting equivalents after the award of Contract. The intent of this process is that, if the Bidder is already aware of an equivalency submission, the risk of acceptance can be reduced by verifying equivalency and, therefore, the bid price prior to award. The risk of whether proposed equivalents are accepted is borne by the Bidder.

- C. SUBSTITUTIONS: For consideration by the Owner, the Bidder may propose to use in the Work substitute items in lieu of those specified, which do not meet the project performance and quality criteria, and can be furnished and installed at a reduced cost (credit) to the Owner with no impact on the Work being done by others.

1. Proposed substitutions must be submitted with the bid or within 72 hours after the bid or prior to the award of the Contract, on the Proposed Substitution Form, which is in the Project Manual following the Proposed Equivalent Form. The Bidder must list any and all deviations from the Contract Documents as well as the corresponding credit amount to be deducted from the Base Bid Proposal if the substitution is accepted by the Owner. This does not exclude the Bidder from submitting a substitution for consideration after the award of the Contract.

2. Substitutions cannot be used as the basis of the bid, they must be listed separately and will be evaluated on a case by case basis. All base bid amounts must be based on the specified materials or acceptable equivalents.
3. In no way will the proposed substitutions influence the successful bidder selection process. Substitutions may not be used to arrive at the lowest qualified bid amount.
4. If a substitution is accepted, the Bidder must coordinate the installation of the substitute and make all associated changes required. The Bidder also waives any claim for additional cost associated with the substitute which becomes apparent before, during, or after installation. The Bidder agrees to bear any and all additional costs to all other contractors or subcontractors which are caused by the incorporation of the substitution.

9. PREPARATION, IDENTIFICATION, AND SUBMISSION OF PROPOSAL

- A. Bidders must submit triplicate copies of the Bid Proposal Forms (one marked 'Official Tender' and others marked 'Copy'), properly signed and completed in every respect pursuant to these Instructions to Bidders, in an opaque, sealed envelope plainly and prominently marked:

"Sealed Bid for (Project Name) _____

Bid Date _____, 20____, by (Name/Address of Bidder)."

- B. Attached to the Bid Proposal Forms envelope, Bidders must submit Bid Security pursuant to Paragraph 10 of these Instructions to Bidders.
- C. All bids will be held for a period of 45 calendar days after their receipt and opening, during which time the Owner has the right to enter into a contract, and the bid securities of the three lowest bidders will be held until the execution of the Contract.
- D. The Owner reserves the right to reject any or all bids proposals and to waive any or all informalities, defects or irregularities in the bid proposals. The Owner reserves the right to make partial awards based on low bids for each item or may select to award on total low bid.
- E. Once the Bid Proposal Forms have been submitted in the sealed envelope, there can be no alterations or amendments; external markings or separate supplementary information will, in no way, affect the sealed bid information. Any necessary adjustment to the proposal must be made prior to its submission and be part of the enclosed sealed bid.
- F. All costs in connection with preparation and submission of bid proposals shall be borne by the Bidders.

- G. A Bidder must submit promptly, upon request of the Owner or Architect, documentary evidence as to its financial, technical, and practical ability to carry out the Work.
- H. A Bidder may withdraw its bid, either in person or by telegraphic or written request, at any time prior to the scheduled closing time for the receipt of bids. 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.

10. BID SECURITY

- A. Each bid must be accompanied by bid security of not less than five percent (5%) of the amount of the bid (including base bids and alternates), which may be a certified check, cashier's check, bank draft, or bid bond executed by a Surety Company authorized to do business in the State of New York and made payable to the Owner.
 - 1. Bid Security must be submitted in a separate sealed envelope clearly identifying the company and project as well as the name and address of the Surety Company.
 - 2. Each bond must be accompanied by a Power of Attorney, giving names of Attorneys-in-fact, and the extent of their bonding authority. All bonds must be countersigned by a resident Agent and with a Surety Company or Corporation meeting the following qualifications:
 - a. Surety must be licensed to do business in the State of New York.
 - b. Surety must be listed on the current U.S. Treasury Department Circular 570 entitled "Companies Holding Certificates of Authority" from the Secretary of the Treasury under the Act of Congress approved July 30, 1974 (6 U.S.C., Sec. 6-13), as Acceptable Sureties on Federal Bonds.
 - c. The Surety must be rated as equal to "A-" or better as to "Policy Holder Ratings" by "Best's Key Rating Guide."
 - d. The bonding limit for each Bidder cannot exceed the amount listed on the above referenced U.S. Treasury Department List for the Surety issuing the bond.
 - e. All Surety companies are subject to approval and may be rejected by the Owner without cause, in the same manner that bids may be rejected.
 - f. In the event any of the requirements outlined herein are not complied with, the Owner will have the right to reject the bid.
- B. Bid security will be returned to all except the three lowest bidders, after formal analysis and evaluation of bids. No bid will be held beyond the 45-day period stipulated above.

- C. Remaining bid security will be returned to bidders after Owner and the successful bidder have executed the Agreement and the Owner has received and approved performance and payment bonds.
- D. If the Agreement has not been executed within the specified period of time after the bid opening, the bid security of any Bidder will be returned upon its request, provided it has not been notified of acceptance of its bid prior to the date of its request.

11. RECEIPT AND OPENING OF BIDS

- A. Bids will be received up to the time and at the location indicated for the opening in the Invitation to Bidders, after which they will be visibly opened and read aloud, and the contents made known to all interested parties present. Each Bidder assumes the risk of any delay in the mail or in handling of mail by employees of the Owner or others.

12. MODIFICATION OR WITHDRAWAL OF PROPOSAL

- A. Bid may not be modified after it has been deposited with Owner.
- B. Bid may not be withdrawn after time set for receipt of bids.
- C. Withdrawn bid may not be resubmitted.
- D. Bid withdrawn after opening of bids will result in forfeiture of bid security.

13. DISQUALIFICATION OF PROPOSAL

- A. The Bidder acknowledges the right of the Owner to reject any or all bids. The Owner reserves the right to reject any or all bids proposals and to waive any or all informalities, defects or irregularities in the bid proposals.
- B. Bid may be disqualified and rejected under any or all of the following conditions:
 - 1. If the Bidder fails to furnish the required bid security, or to submit data required by the Contract Documents, or if the Bid is in any way incomplete or irregular.
 - 2. If the Bid has not been deposited at the designated location prior to the date and time for receipt as indicated in the Invitation to Bidders and these Instructions to Bidders.
 - 3. If there is reason to believe that a Bidder has submitted more than one bid for the same project.
 - 4. If there is reason to believe that collusion exists among Bidders.
 - 5. A Bidder's failure to establish to Owner's satisfaction:
 - a. Proof of ownership, control, or ability to procure necessary plant and equipment to commence the Work at the time prescribed and thereafter prosecute and complete at the rate, or within the time specified.

- b. That Bidder is not already obligated by prior commitment to other work as to likely delay start, prosecution, or completion of the Work required by the Contract Documents.
- c. That Bidder proposes to use reliable and responsible subcontractors or suppliers.

14. AWARD OF CONTRACT

- A. The Contract will be awarded to the lowest qualified responsible Bidder, provided its bid is reasonable and it is in the best interest of the Owner to accept.
- B. 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, or substitutions, if any, which the Owner elects to accept after the opening of bids.
- C. The Owner reserves the right to make partial awards based on low bids for each item or may select to award on total low bid.

15. EXECUTION OF AGREEMENT

- A. The Agreement will be prepared by Owner.
- B. The Agreement must be executed in triplicate within ten calendar days after notification of award at which time the successful contractor must deliver to the Owner all the necessary counterparts of the Agreement in the form set forth in the Bid and Contract Documents.
- C. Performance and payment bonds must be submitted in the form of A.I.A. Document A312, covering performance as well as labor and material payment and extended for the period of time stipulated in Article 11 of the General and/or Supplementary General Conditions, "Bonds and Insurance". An executed bond must be issued by a surety company licensed in New York State.
- D. At the time of execution of the Agreement and prior to the start of construction operations, the successful bidder must furnish documentation in the form and amounts required by the provisions of the Contract Documents that set forth the insurance requirements.
- E. The successful bidder must submit Schedule of Values, as per A.I.A. Form G702A and provide breakdown of costs.
- F. The successful Bidder, upon its failure or refusal to execute and deliver the required documentation, including but not limited to the Agreement and required bonds and proof of insurance within ten calendar days after the Bidder received notice of the acceptance of its bid, will forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with its bid.

16. TAXES AND PERMITS

- A. Material purchased for use in the construction of buildings owned by the Owner are exempt from Federal excise and State sales taxes when the materials are incorporated into and become part of the completed improvement.
- B. Materials, appliances, tools, equipment, or fuel costs which do not become part of the completed improvement will be subject to all applicable taxes.
- C. The Owner is not subject to Federal Tax on transportation of property.
- D. Local Building Permit will not be required.
- E. Exemption certificates will be furnished by Owner for purchases of materials where material is to be incorporated into Work, upon receipt of a copy of the supplier's invoice showing items, net prices, and federal excise tax separately.

17. SUBCONTRACTOR'S LISTING

For multiple prime contracts, a listing of all subcontractors and major material suppliers (including address, telephone number, and name of individual to contact) whose services are proposed to be employed on the project must be submitted within 15 calendar days after signing of the Agreement.

18. TIME OF COMPLETION

- A. Bidder shall agree to start work on _____, and complete within the number of calendar days specified in the Form of Proposal. Project must be completed by _____

19. CONDITIONS OF WORK OPERATIONS

- A. Work under the Contract must be executed and pursued without interruption of or interference with the Owner's operations.
- B. Work operations, access to buildings, and extent of movement of personnel within buildings must be coordinated with and limited by Owner.
- C. Contractor must notify Owner in writing at least 24 hours in advance to advise of intended Work operations to be scheduled and receive approval prior to starting Work.

20. REQUIRED BID INFORMATION:

- A. In addition to any other information/documentation required by these Instructions to Bidders or other Bid Documents, the following information/documentation must be submitted with each bid to be considered a complete and responsive bid. Failure to include any required document in the bid submission may lead to disqualification or rejection of a bid, at the sole discretion of the Owner.

- 1) Bid Proposal Form
- 2) Proposed Equivalent Form
- 3) Proposed Substitution Form
- 4) List of Subcontractors - Provide in a sealed envelope along with bid. (If a Single Prime Contract - See Paragraph 4(A) of these Instructions to Bidders).
- 5) Iran Divestment Act Forms (Certification of Compliance or Declaration of Inability), signed and notarized
- 6) Bid Bond/Security
- 7) Information/documentation required by Paragraph 2 of these Instructions for Bidders and the Statement/Proof of Bidder's Qualifications Form.

END OF SECTION

SECTION 01120 - MULTIPLE CONTRACT SUMMARY HIGH SCHOOL, MIDDLE SCHOOL & TODD ES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Project consists of the construction of Additions and Renovations,
 - 1. Project Location:
 - i. Briarcliff Manor Middle / High School
444 Pleasantville Rd.
Briarcliff manor, NY 10510
 - ii Todd Elementary School
45 Ingham Rd.
Briarcliff Manor, NY 10510
 - 2.
 - 3. Owner: Briarcliff Manor Union Free School District
45 Ingham Rd.
Briarcliff Manor, NY 10510
- B. Architect Identification: The Construction Documents, Dated January 28, 2022- Issued for Bid, that were prepared for the Project by BBS Architects, Landscape Architects & Engineers.
- C. Construction Manager: Savin Engineers, P.C., 3 Campus Drive, Pleasantville, New York, 10570, has been engaged as Construction Manager for this Project to serve as an advisor to Owner and to provide assistance in administering the Contract for Construction between Owner and each Contractor, according to a separate contract between Owner and Construction Manager.
- D. The Work consists of the construction of interior renovations and exterior improvements for Briarcliff Manor High School/Middle School in the Briarcliff Manor Central School District.
 - 1. The Work includes interior renovations and exterior improvements.
 - 2. All materials, assemblies, forms and methods of construction and service equipment shall comply with the requirements of the latest edition of the New York State Building Code.

1.3 DRAWINGS INCLUDED IN CONTRACT DOCUMENTS

- A. Refer to List of Drawings located on Title Sheet of the Drawings.

1.4 CONTRACT

- A. The owner will award the following Construction Contracts for the Project in order to complete all work as indicated and specified:

Phase 1 Bond Improvements at Briarcliff manor MS/HS and Todd Elementary School:

- **Base Bid GC-1 General Construction Contract-MS/HS**
 - **Base Bid GC-2 General Construction Contract, (Single Prime Contract)-HS/MS & ToddES**
 - **Base Bid MC-1 Mechanical Construction Contract-MS/MS & ToddES**
 - **Base Bid EC-1 Electrical Construction Contract-MS/HS & ToddES**
 - **Base Bid RC-1 Roofing Construction Contract-ToddES**
 - **Base Bid RC-2a Roofing Construction Contract-High School**
 - **Base Bid RC-2b Roofing Construction Contract-Middle School**
 - **Base Bid RC-3 Roofing Construction Contract-MS/HS**
- B. In each case, the Contractor agrees to accept the site, as it exists and to remove any encumbrances, which interfere with proper fulfillment of the Work, without change in the Contract Sum.
- C. Accommodate the Owner's intention to continue occupy in the existing building, including site and to conduct normal school operations during the time of construction of the work.
1. Cooperate with the Owner's personnel in maintaining and facilitating access to the school building and its facilities by school personnel, school staff, and the public, while construction is still in progress.
 2. Emergency access at driveways and building entrances: Keep driveways and entrances serving the occupied school building clear and available to the Owner, the Owner's employees and the public, and to emergency vehicles at all times. Do not obstruct access to these areas or use such areas for parking, construction equipment or storage of materials.
 3. Schedule construction operations so as to minimize conflicts with and interruptions to daily school function. Coordinate necessary interruptions with Owner's personnel.
 4. The existing building must remain operational at all times, therefore the Contractors are responsible to maintain all systems such as but not limited to fire alarm, clocks, public address system, electric, gas services, heat, etc.
- D. The Contractor shall cooperate with separate Contractors for any separate Contracts that the Owner may award.

1.6 MULTIPLE PRIME CONTRACTS

- A. The Project will be constructed under a multiple prime-contracting agreement. 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 other prime contracts. The Prime Contractors are advised that under separate cover the Owner will award a Single Prime Contract for Public Address Systems in multiple buildings which will take place concurrently with the Contracts listed below, and with which the Prime Contractors will coordinate as required. Prime Contracts for this Project include:

Phase 1 Bond Improvements at Briarcliff manor MS/HS and Todd Elementary School:

- **Base Bid GC-1 General Construction Contract-MS/HS**
- **Base Bid GC-2 General Construction Contract, (Single Prime Contract)-HS/MS & ToddES**

- **Base Bid MC-1 Mechanical Construction Contract-MS/MS & ToddES**
- **Base Bid EC-1 Electrical Construction Contract-MS/HS & ToddES**
- **Base Bid RC-1 Roofing Construction Contract-ToddES**
- **Base Bid RC-2a Roofing Construction Contract-High School**
- **Base Bid RC-2b Roofing Construction Contract-Middle School**
- **Base Bid RC-3 Roofing Construction Contract-MS/HS**

B. Contract Documents indicate the work of each prime Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Documents include, but are not necessarily limited to the following:

1. Phasing
2. Existing site conditions
3. Alternates
4. Allowances
5. Delegated Design where specified
6. Cutting and Finish Patching
7. Miscellaneous Steel associated with each Contract Work.
8. Firestopping
9. Daily Cleaning (All Contracts are responsible for daily cleaning)
 - a. As per paragraph 1.6.E
10. Final Cleanup (All Contracts are responsible for their final cleanup.)

C. Prime Contract Work: Each Prime Contract can be summarized as follows:

1. The **BASE BID GC-1 GENERAL CONSTRUCTION CONTRACT** includes Abatement, demolition, General Construction related to the **High School and Middle School** Interior reconstruction as shown on the drawings and specified herein. It also includes administrative and coordination responsibilities. Work under this prime Contract includes, but is not limited to the following:

TABLE OF CONTENTS

ALL ITEMS A. thru Y.

DIVISION 1 GENERAL REQUIREMENTS

ALL OF DIVISION 1

DIVISION 3 – CONCRETE

SECTION 03651 – SELF LEVELING GYPSUM-PORTLAND CEMENT UNDERLAYMENT

DIVISION 4 – MASONRY

SECTION 04200 - UNIT MASONRY

DIVISION 05 – METALS

SECTION 054000 - COLD-FORMED METAL FRAMING

DIVISION 06 – WOOD - PLASTICS

06100 – ROUGH CARPENTRY

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

SECTION 07900 – CAULKING

SECTION 07255 – CEMENTITIOUS FIREPROOFING

DIVISION 08 – OPENINGS

SECTION 08110 - STEEL DOORS AND FRAMES
SECTION 08211 - FLUSH WOOD DOORS
SECTION 08710 - DOOR HARDWARE

DIVISION 09 – FINISHES

SECTION 09250 – GYPSUM WALLBOARD
SECTION 09900 - PAINTING

2. The **BASE BID GC-2 GENERAL CONSTRUCTION CONTRACT WORK at the HS/MS and Todd ES, this is a SINGLE PRIME CONTRACT** This Contract includes all Abatement, demolition, general construction, mechanical construction, plumbing construction and electrical construction related to the **HS/MS & Todd ES** interior reconstruction, as shown on the drawings and specified herein. It also includes administrative and coordination responsibilities. Work under this prime Contract includes, but is not limited to the following:

TABLE OF CONTENTS

ALL ITEMS A. thru Y.

DIVISION 1 GENERAL REQUIREMENTS

ALL OF DIVISION 1

DIVISION 3 - CONCRETE

Section 03651 – Self Leveling Gypsum-Portland Cement Underlayment

DIVISION 4 - MASONRY

Section 04200 – Unit Masonry

DIVISION 5 – METAL

Section 05400 – Cold Formed Metal Framing

DIVISION 6 - WOOD AND PLASTICS

Section 06100 – Rough Carpentry

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

SECTION 07900 – CAULKING

SECTION 07255 – CEMENTITIOUS FIREPROOFING

DIVISION 8 - DOORS AND WINDOWS

Section 08110 – Steel Doors and Frames

Section 08211 – Flush Wood Doors

Section 08710 – Door Hardware

DIVISION 9 - FINISHES

Section 09250 – Gypsum Wallboard

Section 09900 – Painting

DIVISION 15 - MECHANICAL

Section 15010 – General Mechanical Requirements

Section 15014 – Codes, Standards, and Permits

Section 15018 – Motors and Electrical Work

Section 15050 – Basic Mechanical Materials and Methods

Section 15100 – Valves

Section 15135 – Thermometers & Gauges
Section 15215 – Vibration Isolation
Section 15250 – Mechanical Insulation
Section 15290 – Duct Insulation
Section 15511 – Fire Stopping
Section 15515 – Hydronic Specialties
Section 15650 – Heating, Ventilation, and Air Conditioning
Section 15657 – Electrical Work
Section 15755 – Exhaust Fans
Section 15800 – Air Distribution
Section 15802 – Inspection, Testing & Balancing
Section 15806 – Fire Dampers
Section 15891 – Ductwork
Section 15893 – Duct Accessories
Section 15895 – Diffusers, Registers, & Grilles
Section 15990 – HVAC Testing Adjusting Balancing
Section 15995 – Mechanical Systems Commissioning
Section 15997 – Mechanical Testing Requirements

DIVISION 15A - PLUMBING

Section 15011A – Plumbing General Provisions
Section 15013A – Codes, Standards, and Permits
Section 15014A – Schedule of Equivalency
Section 15015A – Maintenance Instructions
Section 15050A – Plumbing Basic Materials and Methods
Section 15052A – Access to Plumbing Work
Section 15057A – Plumbing Identification Systems
Section 15060A – Cutting and Patching
Section 15180A – Plumbing Insulation
Section 15411A – Plumbing Domestic Water Piping Systems
Section 15412A – Plumbing Sanitary Piping System
Section 15440A – Plumbing Fixtures & Trim
Section 15511A – Fire Stopping
Section 15985A – Plumbing, Testing, Adjusting and Balancing

DIVISION 16 - ELECTRICAL

Section 16010 – General Provisions
Section 16060 – Grounding and Bonding
Section 16100 – Basic Materials and Methods
Section 16470 – Panelboards
Section 16475 – Circuit Breakers
Section 16511 – Firestopping

3. The **BASE BID MC-1 MECHANICAL CONSTRUCTION CONTRACT** This Contract includes all demolition and Mechanical/Plumbing construction related to the **HS/MS & Todd ES** as shown on the drawings, and specified herein. Work under this contract includes but is not limited to the following:

TABLE OF CONTENTS

ALL ITEMS A. thru Y.

DIVISION 1 GENERAL REQUIREMENTS

ALL OF DIVISION 1

DIVISION 15 - MECHANICAL

Section 15010 – General Mechanical Requirements
Section 15014 – Codes, Standards, and Permits
Section 15018 – Motors and Electrical Work
Section 15050 – Basic Mechanical Materials and Methods
Section 15100 – Valves
Section 15135 – Thermometers & Gauges
Section 15215 – Vibration Isolation
Section 15250 – Mechanical Insulation
Section 15290 – Duct Insulation
Section 15511 – Fire Stopping
Section 15515 – Hydronic Specialties
Section 15650 – Heating, Ventilation, and Air Conditioning
Section 15657 – Electrical Work
Section 15755 – Exhaust Fans
Section 15800 – Air Distribution
Section 15802 – Inspection, Testing & Balancing
Section 15806 – Fire Dampers
Section 15891 – Ductwork
Section 15893 – Duct Accessories
Section 15895 – Diffusers, Registers, & Grilles
Section 15990 – HVAC Testing Adjusting Balancing
Section 15995 – Mechanical Systems Commissioning
Section 15997 – Mechanical Testing Requirements

DIVISION 15A - PLUMBING

Section 15011A – Plumbing General Provisions
Section 15013A – Codes, Standards, and Permits
Section 15014A – Schedule of Equivalency
Section 15015A – Maintenance Instructions
Section 15050A – Plumbing Basic Materials and Methods
Section 15052A – Access to Plumbing Work
Section 15057A – Plumbing Identification Systems
Section 15060A – Cutting and Patching
Section 15180A – Plumbing Insulation
Section 15411A – Plumbing Domestic Water Piping Systems
Section 15412A – Plumbing Sanitary Piping System
Section 15440A – Plumbing Fixtures & Trim
Section 15511A – Fire Stopping
Section 15985A – Plumbing, Testing, Adjusting and Balancing

4. The **BASE BID EC-1 ELECTRICAL CONSTRUCTION CONTRACT** This Contract includes all demolition and Electrical construction related to the **HS/MS & Todd ES** as shown on the drawings and specified herein. It also includes administrative and coordination responsibilities. Work under this prime Contract includes, but is not limited to the following:

TABLE OF CONTENTS

ALL ITEMS A. thru Y.

DIVISION 1 GENERAL REQUIREMENTS

ALL OF DIVISION 1

DIVISION 16 - ELECTRICAL

Section 16010 – General Provisions
Section 16060 – Grounding and Bonding
Section 16100 – Basic Materials and Methods
Section 16470 – Panelboards
Section 16475 – Circuit Breakers
Section 16511 – Firestopping

5. The **BASE BID RC-1 ROOFING CONSTRUCTION CONTRACT**

This Roofing Contract includes all abatement, demolition and Roof Construction at the **Todd ES** Roof as shown on the drawings and specified work under this Contract Includes, but is not limited to the following:

TABLE OF CONTENTS

ALL ITEMS A. thru Y.

DIVISION 1 GENERAL REQUIREMENTS

ALL OF DIVISION 1

DIVISION 6 - WOOD AND PLASTICS

Section 06100 – Rough Carpentry

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07542 – TPO Roofing System
Section 07800 – Roof Accessories
Section 07830 – Roof Scuttle
Section 07900 – Caulking

DIVISION 8 – DOORS AND WINDOWS

Section 08670 – Skylight Protection Screen

6. The **BASE BID RC-2a ROOFING CONSTRUCTION CONTRACT**

This Roofing Contract includes all abatement, demolition and Roof Construction at the **High School** Roof as shown on the drawings and specified work under this Contract Includes, but is not limited to the following:

TABLE OF CONTENTS

ALL ITEMS A. thru Y.

DIVISION 1 GENERAL REQUIREMENTS

ALL OF DIVISION 1

DIVISION 4 - MASONRY

Section 04200 – Unit Masonry

DIVISION 6 - WOOD AND PLASTICS

Section 06100 – Rough Carpentry

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07542 – TPO Roofing System
Section 07800 – Roof Accessories
Section 07830 – Roof Scuttle
Section 07900 – Caulking

7. The **BASE BID RC-2b ROOFING CONSTRUCTION CONTRACT**

This Roofing Contract includes all demolition and Roof Construction at the **Middle School Roof** as shown on the drawings and specified work under this Contract Includes, but is not limited to the following:

TABLE OF CONTENTS

ALL ITEMS A. thru Y.

DIVISION 1 GENERAL REQUIREMENTS

ALL OF DIVISION 1

DIVISION 4 - MASONRY

Section 04200 – Unit Masonry

DIVISION 6 - WOOD AND PLASTICS

Section 06100 – Rough Carpentry

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07542 – TPO Roofing System

Section 07800 – Roof Accessories

Section 07830 – Roof Scuttle

Section 07900 – Caulking

8. The **BASE BID RC-3 ROOFING CONSTRUCTION CONTRACT**

This Roofing Contract includes all abatement, demolition and Roof Construction at the **High School and Middle School** Roof as shown on the drawings and specified work under this Contract Includes, but is not limited to the following:

TABLE OF CONTENTS

ALL ITEMS A. thru Y.

DIVISION 1 GENERAL REQUIREMENTS

ALL OF DIVISION 1

DIVISION 4 - MASONRY

Section 04200 – Unit Masonry

DIVISION 6 - WOOD AND PLASTICS

Section 06100 – Rough Carpentry

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07542 – TPO Roofing System

Section 07800 – Roof Accessories

Section 07830 – Roof Scuttle

Section 07900 – Caulking

1.7 MISCELLANEOUS

A. The following additional requirements for the:

High School and Middle School Contract GC-1 and

High School and Middle School and Todd ES Contract GC-2

General Construction Contract includes, but not limited to the following:

1. Furnish all dumpster for building construction, for use by all MEP trades, except mechanical, plumbing demolition and electrical demolition and light fixtures to provide their own individual dumpsters..
 2. Daily and weekly cleanup of the site and building(s) area(s).
 3. Temporary site protection, bridging and fencing. Furnish, install and maintain sidewalk bridges as required for the safe travel of school occupants from emergency exits in the existing school building. The scope includes preparation and submittal of an engineered shop drawing of the sidewalk bridge.
 4. All blocking and in walls for use by other trades. Other trades shall identify the locations of required blocking.
 5. Blocking where necessary for installation of work under the contract for general construction.
 6. Install Access Panels provided by other Prime Contractors.
 7. Finish patching associated with this Contract Work. Other Prime Contracts are responsible for their own cutting and patching unless noted otherwise.
 8. Install sleeves and other materials provided by other Contracts. Coordinate location of material installation with other Prime Contractors.
 9. Protection of work after installation.
 10. Fire and smoke stop.
 11. Interior floor, wall and ceiling expansion joints as per the contract documents.
 12. Framing for soffits, interior and exterior.
 13. All Interior Architectural Woodwork
 14. All louvers, Casework, Interior Millwork and Architectural Woodwork.
 15. General Contractor to produce a draft CPM Schedule with 10 days and coordinated CPM Schedule within 15 days of award and updated monthly for the duration of the project, MEP to provide their schedules to the General Contractor. Provide Baseline General Construction Schedule incorporating the other Prime Contracts Schedules with the General Construction Schedule, and provide an update to the construction schedule on a monthly basis for the duration of the project as part of the monthly payment requisition process.
 16. Fire Protection specialties including fire extinguishers and cases.
 17. Install sleeves and other materials provided by other Prime Contracts.
Coordinate location of material installation with other Prime Contractors
 18. All Exterior Concrete Equipment Pads as required by other Prime Contractors, coordinate sizes and locations with other Primes.
 19. Establishing and Maintaining Project Monuments for benchmarks / elevations.
 20. This Contract includes the purchasing and installation of doors and door hardware Refer to Specification 087100 Door Hardware and High School Drawings for information on the doors and door hardware. GC to coordinate installation with Owner and its security vendors.
 21. This contract is responsible to protect existing flooring and other finishes in all areas of work affected under this contract.
 22. Temporary sanitary facilities. Minimum one unit per 10 workers and separate unit for women with lock as it applies to each School.
- B. The following additional requirements for the **MS/HS and Todd ES MC-1 and/or GC-1:**
Mechanical Contract includes, but not limited to the following:
1. Identify the locations of and required blocking for their installations by **GC-1**
 2. Provide Access Panels, dimensions and locations to **GC-1** for installation.
 3. Cutting and Finish patching associated with this Contract Work. Other Contracts are responsible for their own cutting and patching unless noted otherwise.
 4. Daily and Weekly Cleanup of the Site and building(s) area(s).
 5. Provide sleeves and other materials including dimensions and locations to the Contractor 1-GC for installation.
 6. Protection of work after installation.

- 7 Fire and smoke stop.
- 8 Interior floor, wall and ceiling expansion joints as per the contract documents for installation of Mechanical work.
- 9 Excavation and Backfill for all site MEP installations, this work is to be coordinated with local utility as required Within the building footprint and to 5'-0" outside the building footprint
10. General Contractor to produce a draft CPM Schedule with 10 days and coordinated CPM Schedule within 15 days of award and updated monthly for the duration of the project. MEP primes to provide their input for the monthly updated schedule that is to be provided by the GC. The General Construction Schedule, is to be updated on a monthly basis for the duration of the project as part of the monthly payment requisition process.
11. Provide sleeves and other material to be installed by the General Contractor, coordinate dimensions and locations with the GC-1.
12. Provide dimensions and location of all Exterior Concrete Equipment Pads for installation by the GC-1 General Contractor.
13. This contract is responsible to protect existing flooring and other finishes in all areas of work affected under this contract.
14. Furnish and install all slotted grilles adjacent to convention radiation, including in walls and casework.
15. GC-1 and GC-2 to Furnish all dumpster for building construction, for use by all MEP trades, except mechanical, plumbing demolition and electrical demolition and light fixtures, MEP trades to provide their own individual dumpsters for demolition.
16. Temporary sanitary facilities. Minimum one unit per 10 workers and separate unit for women with lock as it applies to each School

C. The following additional requirements for the **HS/MS / ToddES MC-1 and/or GC-2:**
Mechanical/Plumbing Contract includes, but not limited to the following:

1. Identify the locations of and required blocking for their installations to the General GC-1 Contractor.
2. Provide Access Panels, dimensions and locations to the General Contractor GC-1 for installation.
3. Finish patching associated with this Contract Work. Other Contracts are responsible for their own cutting and patching unless noted otherwise.
4. Daily and Weekly Cleanup of the Site and building(s) area(s).
5. Provide sleeves and other materials including dimensions and locations to the General Contractor GC-1 for installation.
6. Protection of work after installation.
7. Fire and smoke stop.
8. Interior floor, wall and ceiling expansion joints as per the contract documents for installation of Mechanical work.
9. Excavation and Backfill for all site Plumbing installations, this work is to be coordinated with local utility as required. Within the building footprint and to 5'-0" outside the building footprint
10. Temporary Water: as required for the project to execute Exterior Masonry work, Interior work, Interior finishes and other work as noted in Section 01 50 00 Temporary Facilities and Controls.
11. GC-1 General Contractor to produce a draft CPM Schedule with 10 days and a coordinated CPM Schedule within 15 days of award and updated monthly for the duration of the project. MEP primes are to provide their input for the monthly updated schedule that is to be provided by the GC-1 The General Construction Schedule, is to be updated on a monthly basis for the duration of the project as part of the monthly payment requisition process.
12. Provide sleeves and other material to be installed by the GC-1 General Contractor, coordinate dimensions and locations with the GC-1.
13. Provide dimensions and location of all Exterior Concrete Equipment Pads for installation by

GC-1 General Contractor.

14. This contract is responsible to protect existing flooring and other finishes in all areas of work affected under this contract.
15. GC-1 and GC-2 to Furnish all dumpster for building construction, for use by all MEP trades, except mechanical, plumbing demolition and electrical demolition and light fixtures, MEP trades to provide their own individual dumpsters for demolition.
16. Temporary sanitary facilities. Minimum one unit per 10 workers and separate unit for women with lock as it applies to each School

D. The following additional requirements for the High School and ToddES EC-1 and/or GC-2: Electrical Contractor includes, but not limited to the following:

1. Identify the locations of and required blocking for their installations to the General **GC-1** and/or **GC-2** Contractor.
2. Provide Access Panels, dimensions and locations to the General Contractor for installation.
3. Finish patching associated with this Contract Work. Other Contracts are responsible for their own cutting and patching unless noted otherwise.
4. Daily and Weekly Cleanup of the Site and building(s) area(s).
5. Provide sleeves and other materials including dimensions and locations to the General Contractor for installation.
6. Protection of work after installation.
7. Fire and smoke stop.
8. Interior floor, wall and ceiling expansion joints as per the contract documents for installation of Mechanical work.
9. Excavation and Backfill for all site MEP installations, this work is to be coordinated with local utility as required. Within the building footprint and to 5'-0" outside the building footprint
10. Temporary Electrical: as required to execute Exterior Masonry work, Interior work and Interior finishes, as noted in Section 01 50 00 Temporary Facilities and Controls.
11. GC-1 General Contractor to produce a draft CPM Schedule with 10 days and a coordinated CPM Schedule within 15 days of award and updated monthly for the duration of the project. MEP primes are to provide their input for the monthly updated schedule that is to be provided by the 1-GC. The General Construction Schedule, is to be updated on a monthly basis for the duration of the project as part of the monthly payment requisition process.
12. Provide sleeves and other material to be installed by the GC-1 General Contractor, coordinate dimensions and locations with the GC-1.
13. Provide dimensions and location of all Exterior Concrete Equipment Pads for installation by the GC-1 General Contractor.
14. This contract is responsible to protect existing flooring and other finishes in all areas of work affected under this contract.
15. Provide their own Dumpster for demolition.
16. Electrical Connections for equipment supplied by other Prime Contractors
17. Site Lighting and Main Electrical Power
18. Provide Temporary Electrical service and lighting for the project as note in Section 015000 Temporary Facilities and Controls.
19. GC-1 and GC-2 to Furnish all dumpster for building construction, for use by all MEP trades, except mechanical, plumbing demolition and electrical demolition and light fixtures, MEP trades to provide their own individual dumpsters for demolition.

E. The following additional requirements for the Todd ES RC-1, High School RC-2a, Middle School R-2b and RC-3 Roofing Contracts:

1. Furnish all dumpster for building construction, for use by all trades, except mechanical, plumbing demolition and electrical light fixtures
2. Daily and weekly cleanup of the site, building area and roof.
3. Temporary site protection, bridging and fencing. Furnish, install and maintain sidewalk bridges as required for the safe travel of school occupants from emergency exits in the existing school buildings at all exterior doorways and openings, including all associated interior and exterior safety signage. The scope includes preparation and submittal of an engineered shop drawing of the
4. Finish patching associated with this Contract Work
5. Install sleeves and other materials provided by other Contracts. Coordinate location of material installation with other Prime Contractors.
6. Protection of work after installation.
7. Contractor to produce a draft CPM Schedule with 10 days and coordinated CPM Schedule, as required, within 15 days of award and updated monthly for the duration of the project, Provide Baseline General Construction Schedule incorporating the other work, and provide an update to the construction schedule on a monthly basis for the duration of the project as part of the monthly payment requisition process.
8. Temporary sanitary facilities. Minimum one unit per 10 workers and separate unit for women with lock as it applies to each School

1.8 Temporary service shall be provided as follows:

A. DAILY CLEANING

1. Daily Cleaning: All Prime Contracts are responsible for any and all debris caused by their Work, including the Work of their subcontractors. A daily clean up and disposal is required by each Prime Contract for the periods which that Prime Contract, or its sub-contractors, are performing Work on site
2. Assign at least one person for a daily clean and sweep of the work area(s). Prime Contractor shall allot sufficient manpower and time for this to be completed by the end of each shift. Submit name of this person(s) to Construction Manager.
3. Construction Manager shall have the authority to give direction to person(s) on the Project Site identified by the Prime Contract as designated for cleanup tasks.
4. Any Prime Contract not providing personnel for Daily Cleaning will be Back Charged for labor provided by others to complete this task.
5. Contractor working solely in an area shall be responsible for clean/sweep of that area.
6. Daily cleaning will not mean any one Prime Contract is responsible for assisting another Prime Contract with removing major quantities of debris created by a particular Prime Contract's Work.
7. Daily cleaning will be mandated to remove from the building any debris created by day-to-day activities. Each Prime shall assist in sweeping shared work areas and shared corridors while working on site. Each Prime shall assist in mopping of shared corridors while working on site or as required by the Owner.
8. Prime Contractors shall provide sweeping compound for daily cleaning in their respective interior work areas. Each Prime Contract shall provide a sufficient number of brooms or other necessary tools and equipment, for use by their personnel to adequately fulfill their obligations.
9. Prime Contractors shall provide and maintain garbage cans/refuse containers with liners for each construction area of their respective contracts as directed by the Construction Manager and Prime Contractors shall be responsible for disposing of these materials to a dumpster.
10. **GC-1, GC-2 are to provide all dumpster for use by other trades with the exception of Roofing Contracts** -Prime Contractors shall provide the necessary equipment/containers (lull/skip-box) to move daily clean/sweep debris from the building to a dumpster on a daily basis, for each construction area of their respective contracts.

11. Cleaning shall be deemed a Safety & Health issue, with Prime Contracts being held accountable for fulfilling their contractual obligations.
12. Final Cleaning: At Substantial Completion of each area of construction, each Prime Contract shall wipe/vacuum clean all of their respective installations; Prime Contractors shall mop clean all finish flooring and remove all marks/blemishes to the finish, for each construction area of their respective contracts. Each area of construction shall be wiped clean of all construction dust and debris prior to turnover to the Owner.

1.9 WORK SCHEDULES

- A. All work: done in accordance with a predetermined detailed Work Schedule agreed upon by Owner and Contractors. Each Prime Contractor shall submit a detailed Work Schedule to the Contractor for General Construction, within 10 days after Award of Contract. Schedule shall include all milestone and other significant dates. Contractor for General Construction shall combine all into a CPM schedule within 15 days of award and update weekly for the duration of the project, all primes to sign off on final CPM Schedule.
 1. Work Schedule shall be computer generated, in CPM format and in an additional format as approved by the Architect and Owner. Work Schedule shall be revised weekly during the Course of the Work. The latest revised Work Schedule shall be submitted each month with the Application for Payment.
- B. General Contractor shall coordinate work with the Owner, other Contractors at the site, and all of its subcontractors.
- C. Locations of trailers, storage areas, parking areas, and staging areas shall be coordinated with the Owner, Construction Manager and Architect.
- D. It will be the responsibility of the Contractor to carefully interface all construction operations until they reach their final completion, and so the Owner's programs and services can be carried on without interruptions so that a smooth flow of all operations by all involved trades will be achieved within the allotted time.

1.10 ACCESS TO THE SITE

- A. 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.

1.11 CODES APPLICABLE

- A. Construction will be governed by: New York State Uniform Fire Prevention and Building Code, current applicable edition, and its referenced codes and standards.
State Education Department Manual for Planning Standards.

1.12 PREPARATION OF SITE

- A. Contractor agrees to accept site as indicated and to remove Encumbrances, which interfere with proper fulfillment of his work without change in Contract Sum.

- B. All Work as noted inside or outside of Contract Limit Lines shall be performed by Contractor as part of Contract Work.

1.13 CONTRACTOR'S USE OF PREMISES

- A. Confirm Operations at the Site to Areas and Methods Permitted by:
 - 1. Laws.
 - 2. Ordinances.
 - 3. Permits.
 - 4. Contract Documents.
 - 5. Owner's regulations.
- B. General: During the construction period the Contractor's shall have full use of the premises for construction operations. The Contractor's use of the premises is limited only by the Owner's right to perform construction operations with its own forces or to employ separate contractors on portions of the project.
- C. Confine operations to areas within Contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.
- D. Do not unreasonable encumber site with materials or equipment.
- E. Do not load structure(s) with weight that will endanger structure.
- F. Each Subcontractor is responsible for protection and safekeeping of his materials, products and equipment stored on the premises that is incorporated into the construction, until his contract is complete and accepted by the Owner.
- G. Site Access: 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.
- H. Move at the Contractor's/Subcontractor's cost any stored materials, products or equipment which interfere with operations of Owner or others.
- I. Special Owner Requirements:
 - 1. Partial Owner Occupancy: The Owner reserves the right to occupy and to place and install equipment in completed areas of the building, prior to Substantial Completion provided that such occupancy does not interfere with completion of Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.
 - 2. All activities required on the site for completion of the work shall be accomplished within the Contract limit lines as indicated on the Drawings.

1.13 LINE AND LEVELS

- A. Drawings indicate location of the Work.
- B. Contractor shall layout all Work prior to construction and will be held responsible for its accuracy. Layout approval by Owner and Architect is required prior to construction.
- C. Owner shall establish a "Datum" or "Bench Mark" at convenient locations, which will remain throughout Work, for convenience and constant reference for use of all Contractors.

- D. Each Contractor is responsible for their own survey(s) and layout.

1.14 TIME FOR COMPLETION

- A. It shall be understood and mutually agreed that the time for Substantial Completion is an essential condition of this Contract.
- B. Contractor agrees that Work shall be prosecuted diligently and uninterruptedly at such rate as will ensure Substantial Completion of all Work and Certificates of Occupancy on or before the date stated in the Contract.
- C. It is expressly understood and agreed by Contractor and Owner that the time for Substantial Completion and Certificates of Occupancy are reasonable, taking into consideration average Climatic range, restrictions concerning use of the site, and Other prevailing conditions.
- D. Contractor shall schedule the Work accordingly.

1.15 EXAMINATION OF SURFACES TO BE COVERED

- A. Prior to application of materials included in the various Sections, the installer, the manufacturer's representative, and the Contractor shall together examine the building and surfaces upon which materials are to be supplied.
- B. The installer and the manufacturer's representative shall accept all surfaces and conditions affecting proper installation of their materials. The installer shall not proceed with the work until all conditions and surfaces are satisfactory to him.
- C. The Contractor shall do all work necessary to correct unsatisfactory conditions and surfaces not specifically included as work of the subcontractor.
- D. The subcontractor shall furnish to the Contractor for submission to the Architect 2 copies of his statement, countersigned by the manufacturer or his appointed representative that the entire installation has been made by correct techniques over properly prepared surfaces and under proper job conditions.

1.16 FIRE SAFETY REQUIREMENTS

- A. The Contractor shall conform to the following mandatory Requirements during the course of the work:
 - 1. Construction related debris shall be cleaned out of the Building at the end of each working day.
 - 2. No combustible materials shall be stored neither within the building, nor on the school grounds unless as directed.

1.17 SCHEDULE OF VALUES REQUIREMENTS

- A. The Contractor shall conform to the following mandatory requirements for percentages of the total contract value, including accepted add alternates, for the Schedule of Values (SOV) submission:
 - 1. General Conditions – 2%
 - 2. Meeting Attendance – 2%
 - 3. Shop Drawings / Samples Submissions – 1%

4. Temporary Utilities & Services – 1%
5. Coordination Drawings – 1%
6. Punch-List – 1%
7. Close-Out Documents (Warranties/Guarantees, As-Builts & O&M Manuals) – 3%

1.18 COORDINATION DRAWINGS

- A. The Contractor shall coordinate the work of all Sub-Contractors, arrange space conditions to accommodate the work of all trades and prepare composite drawings as required to scale clearly the work of each trade Contractor in relation to each other.
- B. The Contractor will be held responsible to correct unsatisfactory conditions resulting from improper coordination.
- C. Contractors to communicate and supply shop drawings to each other to insure proper coordination.
- D. Coordination drawings shall be submitted to the Architect for review and approval.
- E. Daily field reports are to be provided by all Contractors to the Construction Manager.
- F. Coordination Meetings:
 1. General: Contractors are to prepare a written memorandum on required coordination activities. Include such items as required notices, reports, minutes of meetings, and attendance at meetings. Distribute this memorandum to each entity performing work at the project site. Prepare similar memorandum for separate contractors where interfacing of their work is required.
 2. Weekly coordination meetings: Contractors shall schedule and hold weekly general project coordination meetings at regularly scheduled times that are convenient for the attendance of other parties involved in the project (i.e. Owner, Architect, CM, Sub-Contractors etc.). The Contractors shall record meeting results and shall make them available to the Project Team. These meetings are in addition to the specific meetings held for other purposes, such as regular project meetings and special pre-installation meetings. Required attendance includes each prime contractor and every other entity identified by any prime contractor as being currently involved in the coordination or planning for the work of the entire project. Conduct meetings in a manner that resolve coordination problems. The Construction Manager shall have a representative at the meetings. The Contractors shall distribute copies of the meeting result to everyone in attendance, the Architect and to others affected by the decisions and actions resulting from each meeting.
- G. Scaled and figured dimensions with respect to the items are approximate only; sizes of equipment have been taken from typical equipment items of the classes indicated. Before proceeding with the work, the contractor shall carefully check all dimensions and sizes and shall assume full responsibility for the fitting in of equipment and materials to the building and to meet architectural and structural conditions.
- H. Separate plans shall also be prepared for sleeve locations and concrete pads for mechanical equipment required by all contractors for the performance of their work. These drawings shall be coordinated with the coordination drawings. When final information is received, such data shall be promptly inserted on the coordination drawings.
- I. The Mechanical/HVAC Contractor shall provide Electronic Coordination Drawing(s) files, at a scale of 3/8" – 1'-0" showing all HVAC equipment, ductwork, and major piping, including elevations and dimensions to all fixed building elements, such as beams; columns, slabs; ceilings; including ceiling suspensions; framing; floor; walls; doors, including door swings; and windows affected by the equipment, ductwork, and piping. Show all registers, grilles, diffusers, radiators and convectors,

- and other terminal elements. This drawing is to be used to coordinate installations by other prime contractors. Show location of all valves, dampers (fire, smoke, volume, and automatic), coils, humidifiers, smoke detectors, etc. requiring access for service and maintenance. Locate all access doors. Include large-scale details and sections as required to fully delineate the conditions in congested areas, leaving space for the work of the other contractors. Show plan layout of all equipment bases, pads, and inertia blocks. Clearly label all work by Mechanical/Plumbing Contractor. This Prime Contractor to also show existing Mech/HVAC., Ductwork, Equipment and other existing Mech/HVAC. appurtenances on the Electronic Coordination Drawing(s).
- J. The Plumbing Contractor shall overlay on the Electronic Coordination Drawings prepared by the Mechanical/HVAC Contractor which shall indicate all Plumbing water supply, drain, waste, vent, sprinkler main and branch piping, risers and sprinkler heads and other major lines. Indicate piping elevations and locations of the fire hose cabinets, drinking fountains, etc., which encroach on duct shafts. Locate valves and other items requiring access for service and maintenance. Locate all access doors. Avoid interference with HVAC work and with building construction. Use same scale as drawing being overlaid. Clearly label all work by Plumbing Contractor. This Prime Contractor to also show existing Plumbing, Piping, Vents, Drains and other existing Plumbing appurtenances and equipment on the Electronic Coordination Drawing(s).
- K. The Electrical Contractor shall overlay on the Electronic Coordination Drawings (after the Mech/HVAC and Plumbing Prime contracts) The Electronic Drawings are to be overlaid and prepared by the Electrical Prime contract. Coordinating locations of existing Plumbing and Fire Protection Contractors all main conduit and bus runs, cable trays, light fixtures, major equipment, and switch gear and panel boards and clearances. Show all items requiring access for service and maintenance. Locate all access doors. Avoid interference with exist HVAC, Plumbing, and Fire Protection work and with building construction. Use same scale as drawings being overlaid. Clearly label all existing work and new work by the Electrical Prime. This Prime Contractor to also show existing Electrical Conduits, piping, Equipment and other existing Electrical appurtenances on the Electronic Coordination Drawing(s).
- L. Each Contractor shall use the signed completed coordination drawings as a working reference. Compare all shop drawings, prior to their submittal to the Architect, with the coordination drawings and revise the shop drawings to fit the coordination drawing condition. If revisions to the coordination drawings are required because of shop drawings, make revisions as directed by AOR/EOR and notify all affected contractors with copy of notification to Construction Manager. Maintain up-to-date record of all revisions on own coordination drawing copies; keep one copy at project site.
- M. No extra compensation will be paid to any contractor for relocating any duct, pipe, conduit, or other material installed without coordination among trades involved or among other affected contractors. Each Contractor who causes any additional work to other contractors by improperly coordinated work or work not installed in accordance with the signed coordination drawings shall reimburse the affected other contractors for the cost of the additional work.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 011200

SECTION 01130

MILESTONE SCHEDULE

PART 1 – GENERAL

1.01 MASTER SCHEDULE

The following milestone schedule serves as a basis for bidding. A Master Schedule will be developed at a general meeting of the awarded contractor(s) within 10 days of Award the Contracts. This Master Schedule will incorporate the milestones listed below.

1.02 SUBSTANTIAL COMPLETION & MILESTONE DATES

- A. Award Contracts within 30 days of Contract Opening
- B. Start Contract Work – Date of Award of Contracts
- C. Milestone Dates – Reference CIP drawings for areas of work defined by each phase.
Contracts:

Briarcliff Manor Middle/High School
GC-1, GC-2, MC-1, EC-1, RC-2a, RC-2b & RC-3

Todd Elementary School
GC-2, MC-1, EC-1 & RC-1

MS/HS Interior Reconstruction

Commence ACM Abatement	06/27/2022
Complete ACM Abatement	07/08/2022
Commence Construction	07/11/2022
Substantial Completion	08/19/2022
Any remaining work to 2 nd Shift as of	08/29/2022

Todd ES Interior Reconstruction

Commence Construction	06/27/2022
Substantial Completion of	08/19/2022
Any remaining work to 2 nd shift as of	08/29/2022

MS/HS Roof/Exterior

Commence Construction	06/27/2022
Substantial Completion of	08/19/2022
Any remaining work to 2 nd shift as of	08/29/2022

Todd ES Roof/Exterior

Commence Construction	06/27/2022
Substantial Completion of	08/19/2022
Any remaining work to 2 nd shift as of	08/29/2022

MS/HS & Todd ES

Punchlist – All Phase 1 Contracts	30 Days after Substantial Completion
Final Closeout – All Phase 1 Contracts	30 Days after Substantial Completion

Asbestos Abatement at all schools and building is critical to the construction schedule and shall be scheduled so that the abatement work is completed and areas are cleared for other Trades and other

Prime contractors to commence their work after two week(s) of construction, starting on 7/11/2022. The Briarcliff Manor UFSD will make arrangements to have the building available for second shift and 24-hour work if necessary, to complete the asbestos abatement work in the first two weeks of the project.

D. Final Close-out of all Contract(s)

a. Final Close-out of Contract

- i. Final close out of all contracts shall be within 30 days of the substantial completion dates established above. All work including, but not limited to punch lists, project closeout, testing, balancing, Owner training, O&M manuals, as-builts, warranties, etc. shall be complete.
- ii. All work required by the Construction Manager to execute final closeout of contracts after dates noted established above, if determined to be caused by contractor, shall result in payment to the Construction Manager in the form of a change order deduct to the base contract.

F. Coordination of Move-In

It is the intent of the School District to begin move-in of furnishings, fixtures and equipment prior to the dates of substantial completion as outlined above. The Contractor shall work in harmony with the School District to facilitate such move-ins for the purpose of beneficial use and occupancy.

G. School District/School Operation and Custodial Hours

During the Summer work will be permitted between 7:00 a.m. and 4:00 p.m. all days except Saturday and Sundays. Any special work arrangements (weekends, 2nd shift) must be made through the Owner. Work during the School Year must be scheduled after School Hours. During the school year the HS/MS will be open until 9:30p.m and the ToddES will be open until 9:00pm. Any work during the school year must be performed after school hours and the work areas are to be cleared and cleaned by the contractor before 9:30pm at the HS/MS and before 9:00pm at the ToddES.

As noted above, if it is necessary to perform work outside of the regular time periods established in the Milestone Schedule (1st shift during summer, 2nd shift during the school year), the Prime Contractor performing the work (or responsible for such work being performed by subcontractors) will be responsible for the additional cost to the Owner for having the Architect and/or Construction Manager on site during weekend or 2nd shift hours. This cost will be passed back to the Prime Contractor by deduct change order.

The Architect and Construction Manager shall not be over-burdened as to overtime cost, to monitor the work, due to no cause of his or her own. Owner will compensate the Architect and Construction Manager for all additional cost related to the issue of a Prime Contractor's failing to execute the Contract by fully staffing the work during the regular time periods established in the Milestone Schedule. The Owner reserves the right to back charge the responsible Prime Contract for these fees if incurred.

No work may occur in the school during occupied times unless there is a separation and separate access to the work area and noise is restricted to max 60 db. Any requests to work during school hours must be submitted in writing to the School District for approval. The submission must include a diagram showing how the construction area will be separated from occupied areas. Additionally, it must show temporary measures to be installed such as ventilation, screening, dust protection, fire separation, etc. The School District reserves its right to accept or reject the request at their discretion.

END OF SECTION 011300

SECTION 01210.2 – SCHEDULE OF ALLOWANCES

PART 1 – SCHEDULE OF ALLOWANCES

A. Include in the base bid a contingency allowance in the amounts listed below for unforeseen conditions.

B. Allowances are as listed below.

- | | | |
|----|-------------------------------------------------------|-------------|
| 1. | Contract GC-1 – MS/HS | \$15,000.00 |
| 2. | Contract GC-2 (Single Prime) - MS/HS & Todd ES | \$45,000.00 |
| 3. | Contract MC-1 - MS/HS & Todd ES | \$15,000.00 |
| 4. | Contract EC-1 – MS/HS & Todd ES | \$15,000.00 |
| 5. | Contract RC-1 – Todd ES | \$15,000.00 |
| 6. | Contract RC-2a – High School | \$50,000.00 |
| 7. | Contract RC-2b – Middle School | \$35,000.00 |
| 8. | Contract RC-3 – MS/HS | \$75,000.00 |

Circle the Allowance(s) for the Contract submitted

Submitted by:

Contractor:_____

Date:_____

Name:_____

Position:_____

END OF SECTION - 012100

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions of the Contract for Construction and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities for each of the projects; grouped facility or single facility.
- B. Related Sections include the following:
 - 1. Division 01 Section "Multiple Contract Summary and Contract Summary" for division of responsibilities for temporary facilities and controls.
 - 2. Division 01 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
 - 3. Divisions 02 through 33 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.

1.3 DEFINITIONS

- A. Permanent Enclosure: As determined by Architect, exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.4 USE CHARGES

- A. Use Owner's existing utilities at no additional or change in contract sum.
- B. Water Service: **Mechanical/Plumbing Contract for each Contract** shall provide connection to Owner's existing water system as available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations using backflow preventer. Removal by same.
- C. Electric Power Service: **Electrical Contract for each Contract** shall provide power from Owner's existing system as available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations. Removal by same.
- D. Each Contractor and their Subcontractors shall take measures to conserve water, electric consumption and use of utilities.

1.5 SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.6 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.7 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.76-mm-) thick, galvanized steel, chain-link fabric fencing; minimum 8 feet (2.4 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top rails. Provide dust screen along all fencing.
- B. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 9-gauge, galvanized steel, chain-link fabric fencing; minimum 8 feet (2.4 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide galvanized steel bases for supporting posts. Provide dust screen along all fencing.
- C. Lumber and Plywood: Comply with requirements in Division 06 Section "Miscellaneous Rough Carpentry."
- D. Gypsum Board: Minimum 5/8 inch (12.7 mm) thick by 48 inches (1219 mm) wide by maximum available lengths; fire rated-type panels with tapered edges. Comply with ASTM C 36/C 36M.
- E. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
- F. Paint: Comply with requirements in Division 09 painting Sections.

2.2 TEMPORARY FACILITIES

- A. Field Offices: Prefabricated units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Owner/CM/Architect Field Office: **GC-1 / GC-2 CONTRACT at the MS/HS: General Construction** shall furnish and equip offices at the Briarcliff Manor High School / Middle School as follows:

2.3 FIELD OFFICES / TRAILERS

- A. Field Offices: Prefabricated units with serviceable finishes, temperature controls, and foundations adequate for normal loading. Ref.CIP Drawings for the location of Field Offices and staging areas at the HS/MS and for the staging areas at ToddES.**EC-1 / GC-2** to provide power for the HS/MS Field Office.
- B. Owner/CM/Architect Field Office: GC-1 / GC-2 Contracts shall furnish and equip offices at the Project site.

1. Provide 12'x 40' Office by Williams Scotsman for use by Owner/Construction Manager/Architect personnel engaged in construction activities. Office trailer must have toilet facilities and sink, contractor needs to maintain/service the toilet for the duration of the project at Owner/CM/Architect trailer. The Trailer is to be fully skirted. The trailer location will be as directed by the Owner and CM.
2. Trailer to have exterior lighting
3.
 - a. Provide (2) telephone lines with caller ID, waiting and call forwarding services.
 - b. Provide (2) Wireless Telephones with speakers and voicemail capability and expansion units
 - c. Provide (1) High speed internet service with wireless router and Ethernet Switch
4. Provide the following new equipment which shall become the property, excluding the Multifunction Printer, of the Owner at the end of the project.
 - (1) Plan Table (6'Lx4'W)
 - (2) May-line Pivot Wall Rack with 24 Racks (Installation by GC) or
 - (3) standing type.

Note That All Computer Products referenced below are to be as Manufactured by Dell.

(2) **Monitors** Dell 24 Monitor – P2419H SKU 210-AQDX – NOTE:

2 Monitors for each of the Laptop Computers. For each Laptop computers provide a docking station, keyboard and mouse.

(1) Hardware Support Services 4 years Advanced Exchange Service
SKU 814-5380, 814-5382

(1) **Laptop Computer** – Dell Latitude 5400 series or better with:

Processor – 11th Generation Intel Core i5-1145G7 (4 Core, 8M cache, base Dell Latitude 5400 series or equivalent

Intel i5 processor

Microsoft Windows 10 with option to upgrade to Windows 11

16GB Memory

500GB Solid State Hard Drive

Webcam

Primary Batter 4 Cell 63Whr ExpressCharge™ capable Battery SKU 451-BCSW

Power Supply 65W Type-C Adapter SKU 492-BCXP

Hardware Support Services 3 Years hardware Warranty with Onsite/In-Home Service

SKU 975-3461, 997-8317, 997-8328, 997-8332

(1) Laser Color Multifunction printer/copier/fax/scanner with 11x17 paper tray
with Network capability by Ricoh standalone unit or equal, (provide ink and
paper supplies for the project duration) to include 24 hour on call servicing

(3) 4 Drawer File Cabinet heavy duty

Paper as required for the duration of the project: 8.5x11, 8.5x14 and 11x17.

File Folder and Hanging File Folders as required for the duration of the project for the
paper sizes as noted above.

- (3) Wall Mounted Shelves (6'x14") Installation by GC.
- (2) Tack boards 36" x 48" Installation by GC
- (2) White boards 36" x 48" with erasers and markers, installation by GC
- (2) Built in Desk (66"W x 30"D x 29-1/2"H) w/ (3) Padded Swivel Manager Desk Chair (Staples® Greeley™ Manager's Chair, Black Luxura)
- (1) Large trash container and (2) small trash container (provide bags for project duration and weekly cleanup of trailer)
- (2) Conference Table (30"W x 72"L x 29"H)
- (10) Vinyl Padded Folding Chairs
- (1) Cold/Hot water dispenser (provide delivery service for project duration)
- (1) 3.6 Cu. Ft. Refrigerator
- (1) 0.7 Cu. Ft. Microwave Oven
- (1) First aid kit - Global Industrial First Aid Kit - 3 Shelf Steel Cabinet, ANSI Compliant, 75-100 Person

- C. **(2) Fire Extinguisher-** shall be UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

1. Drinking water and private toilet.
2. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg. F (20 to 22 deg. C).
3. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.
4. Owner/CM Field office shall be secured and be provided with completing skirting around perimeter.
5. Owner/CM Field office to be swept, mopped and toilet facilities sanitized weekly
6. Provide security bars at doors and security screens at all windows.
7. Provide stairs at each door.
8. Provide Three-inch (3) gravel base, for 2500 Sq Ft area at Owner trailer area as per CM direction.
9. Provide (2) Two heavy duty master locks with (4) four keys

- D. The **Electrical Contract for EC-1 / GC-2 at the MS/HS** shall provide power to the Owner/CM/Architect Field Office at the Briarcliff MS/HS.

- E. The Owner/CM/Architect Field office shall be located at the site as directed by the CM and Owner.

- F. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

1. Store combustible materials apart from building.

2.4 EQUIPMENT

- A. Fire Extinguishers: Each Contractor shall provide portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, **General Construction Contractor for each Contract** shall provide temporary heat as may be required. The **General Construction Contractor**, shall submit to the owner the equipment to be used for approval prior to the commencement of work. The **Electrical Contract for each Contract** shall provide sufficient power for The **General Construction Contractor for each Contract's** Electric Heaters for Temporary Heat, as needed and required Coordinate work with GC. With For Single Prime Contracts the General Contractor is to provide power for Temporary Heat.

- C.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 13 rating at each return air grille in system and remove at end of construction.
4. UL listed Electric Heaters for the intended use.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. **GENERAL:** Install temporary service or connect to existing service.
 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. **SEWERS AND DRAINAGE:** **General Construction Contractor for each Contract** provides temporary utilities to remove effluent lawfully. For Single Prime Contracts the General Contractor is to provide power for Temporary Heat.
- C. **WATER SERVICE:** **GC-2 / MC-1 - Mechanical/Plumbing Contractor for each Contract** shall use Owner's existing water service facilities, if facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use. For Single Prime Contracts the General Contractor is to provide power for Temporary Heat or EC-1 is to provide power for Temporary Heat.
- D.
 1. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.
- E. **SANITARY FACILITIES:** **GC-1 / GC-2 - General Construction Contractor for each Contract** shall provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities. The location of the temporary toilets must be submitted to the owner for approval prior to the commencement of work.
- F. **HEATING:** **GC-1 / GC-2 - General Construction Contracts for each Contract** shall provide temporary heating required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being

installed.

- G. VENTILATION AND HUMIDITY CONTROL: **Each Contractor** shall provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- H. ELECTRIC POWER SERVICE: **GC-2 / EC-1 - Electrical Contract for each Contract** shall use of Owner's existing electric power service, as long as equipment is maintained in a condition acceptable to Owner. For Single Prime Contracts the General Contractor is to provide electrical power service.
- I. ELECTRIC POWER SERVICE: **GC-2 / EC-1 - Electrical Contract for each Contract** shall provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations. For Single Prime Contracts the General Contractor is to provide electrical power service
1. Connect temporary service to Owner's existing power source, as directed by Owner.
 - a) **GC-2 / EC-1 - Electrical Contract for each Contract** is responsible for all labor and miscellaneous material (exclusive of breakers and starters) required for temporary connection and disconnection of temporary electrical power panels and/or equipment which requires a hard-wired connection to an electrical panel and which is supplied and utilized by other prime contractors (or their subcontractors) to perform their work. For Single Prime Contracts the General Contractor is to provide electrical power service and temporary connections.
- J. LIGHTING: **GC-2 / EC-1 - Electrical Contract for each Contract** shall provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions. For Single Prime Contract the General Contractor is to provide Temporary Lighting.
1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
1. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines. Comply with NFPA 241.
 2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Temporary Paved Areas: **General Construction Contract for each Contract** shall construct and maintain temporary paved areas adequate for construction operations. Locate temporary paved areas within construction limits indicated on Drawings.
1. Provide dust-control treatment that is nonpolluting and non-tracking. Reapply treatment as required to minimize dust.
- C. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- D. Parking: Use designated areas of Owner's on-site parking for some construction personnel.
1. Owner will designate a minimum of 2 spaces and may designate more when facility is not being used.
 2. On-street parking arrangements for other spaces are the responsibility of each Contract.
- E. Project Identification and Temporary Signs: **General Construction Contract for each Contract** to Provide Project identification and other signs. Install signs where indicated to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted. Installation and removal by Contractor at no additional cost to Owner.
1. Provide temporary, directional signs for construction personnel and visitors.
 2. Maintain and touchup signs so they are legible always.
- F. Waste Disposal Facilities: Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."
- G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 01 Section "Execution" for progress cleaning requirements.
- H. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- I. Existing Elevator Use: Use of Owner's existing elevators will not be permitted.
- J. Existing Stair Usage: Use of at least one of Owner's existing stairs will be permitted if stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If, despite such protection, stairs become damaged, restore damaged areas so no evidence remains of correction work.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
1. Comply with work restrictions specified in Division 01 Section "Summary of Work."
- B. Site Enclosure Fence: Before construction operations begin, **General Construction Contract for each Contract** is to furnish and install site enclosure fence and gates in a manner that will prevent people and animals from easily entering site except by entrance gates.

1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Owner and Construction Manager each with one set of keys.
- C. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
- D. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- E. Temporary Enclosures: **General Construction Contract for each Contract** to Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
1. Where heating is needed and permanent enclosure is not complete, insulate temporary enclosures.
- F. Temporary Partitions: **General Construction Contract for each Contract** to Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
1. Construct dustproof and fire rated partitions with 5/8" type 'x' gypsum wallboard with joints taped on both sides. Paint occupied side of partition.
 2. Construct dustproof partitions with 1 layer of 4-mil (0.09-mm) polyethylene sheet on each side. Cover floor with 1 layer of 4-mil (0.09-mm) polyethylene sheet, extending sheets 18 inches (460 mm) up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant plywood.
 3. Sound Insulate partitions to provide noise protection to occupied areas.
 4. Seal joints and perimeter. Equip partitions with dustproof HM doors and frames with security locks.
 5. Protect air-handling equipment, heating equipment, casework and carpeting.
 6. Weather strip openings.
 7. Provide walk-off mats at each entrance through temporary partition.
- G. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
1. Prohibit smoking in construction areas.
 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Replace damaged street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 3. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."
- D. Site Restoration: **General Construction Contracts for each Contract** shall restore all areas disturbed on the site to original condition.
1. Restore grass areas.
 2. Replace damaged asphalt paving
 3. Replace damaged walkways
 4. Replace landscaping that has been damaged.

END OF SECTION 015000

FINAL REPORT OF ENVIRONMENTAL SERVICES

Performed at:

**BRIARCLIFF MIDDLE/HIGH SCHOOL
444 PLEASANTVILLE ROAD
BRIARCLIFF MANOR, NY 10510**

Prepared for:



**Briarcliff Manor Union Free School District
45 Ingham Road
Briarcliff Manor, NY 10510**

Prepared by:



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

**Project No. 31403475.004
Final Submission Date: September 21, 2021**



September 21, 2021

Mr. Anthony Bauso
Assistant Director of Facilities Operations & Maintenance
Briarcliff Manor Union Free School District
45 Ingham Road
Briarcliff Manor, NY 10510

**Subject: Final Report of Environmental Services
Briarcliff Middle/High School
444 Pleasantville Road
Briarcliff Manor, NY 10510**

Dear Mr. Bauso:

WSP USA Solutions, Inc. has completed a material inspection at the Briarcliff Middle/High School located at 444 Pleasantville Road, Briarcliff Manor, NY 10510. 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 BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Briarcliff Middle/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.

A handwritten signature in blue ink, appearing to read 'CN', is written over a light blue circular stamp.

Craig Napolitano, CHMM
Vice President, Emergency Management & IH Services



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Appendices

Appendix A: Asbestos Sample Analysis Results in Tabular Form

Appendix B: Asbestos Bulk Sample Field Data Sheets with Chain of Custody & Laboratory Results

Appendix C: Asbestos Bulk Sample Location Drawings

Appendix D: Asbestos Containing Materials Location Drawings

Appendix E: Lead XRF Shot Results

Appendix F: PCB Bulk Sample Field Data Sheets with Chain of Custody & Laboratory Results

Appendix G: Company License, Personnel Certifications and Laboratory Accreditations

Appendix H: Scope of Work Drawings

Appendix I: Photographic Documentation

Appendix J: File Search



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 Briarcliff Middle/High School located at 444 Pleasantville Road, Briarcliff Manor, NY 10510. The intent of this inspection was to screen for ACM, LBP and PCBs that may be impacted during the BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Briarcliff Middle/High School.

Stephen Gruber, Nicholas Colonna and Nicholas Casale of WSP performed this inspection on August 10, 13, 18 and 26, 2021. Mr. Gruber is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert# 17-42557) and is licensed New York State EPA as a Lead Inspector (Cert# LBP-I-1219874-1). Mr. Colonna is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert# 14-18092) and is licensed New York State EPA as a Lead Inspector (Cert# LBP-I-1208881-1). Mr. Casale is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert# 17-25789) and is licensed New York State EPA as a Lead Inspector (LBP-I-1207478-1)

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 BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Briarcliff Middle/High School:

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 08/10/21, 08/13/21, 08/18/21 and 08/26/21 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **Tar (Black) at base of AHU Kerb**
- **Joint Compound (Tan) associated with Gypsum Board**
- **Cementitious Material (White) at Roof Drain Bowl**

The following materials **contain asbestos as per 2019 AHERA Report**

- **12"x12" White VAT w/ Gray Marble and Mastic**
- **12"x12" White VAT w/ Gray Specks and Mastic**
- **Mastic to 12"x12" Light Blue w/ Dark Blue VAT**
- **Mastic to 12"x12" Light Salmon w/ Dark Salmon VAT**
- **Sheetrock (Joint Compound Only)**
- **Mudded Joint Packing**
- **Transite Table Top Beneath Hood (Not Affected by SOW)**
- **Pipe Elbows**
- **Ceiling Plaster, White Coat (Girls Locker Room Shower) (Not Affected by SOW)**

Analytical results of the bulk samples collected on 08/10/21, 08/13/21, 08/18/21 and 08/26/21 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);



Final Report for Environmental Inspection Services

- Brick Mortar, Grey
- Brick Mortar, Pink
- Stone Mortar, Grey
- Tar (Black) on Foil Paper on Air Handling Units
- Caulking (Grey) on Skylight Panel
- Caulking (Beige) on AHU
- Pitch Pocket Sealant (Grey)
- Pitch Pocket Sealant (White)
- Vent Pipe Sealant (Grey)
- Caulking (Black) at Metal Façade Panels
- Caulking (White) at Metal Cap Flashing
- Expansion Joint Caulking (Grey) on Wall
- Gypsum (White) Roof Deck Material
- Fiberboard (Brown) Under EPDM Roofing
- Perlite (Tan) Insulation Under EPDM Roofing & Epoxy Roofing
- Fibrous insulation (Brown) Under EPDM Roofing
- Felt Paper (Black) Under EPDM Roofing
- Sealant (white) on Square Exhausts
- Caulking (Black) at Square Skylight Panels
- Caulking (Black) at Metal Cap / Stone Wall
- Caulking (White) on Foil Paper AHU Seams
- Spray-On Fire Proofing on Beams
- Yellow Adhesive associated with Carpet Flooring
- 12"x12" Black Vinyl Floor Tiles
- Yellow Adhesive associated with 12"x12" Black Vinyl Floor Tiles
- Yellow Adhesive associated with Carpet Flooring
- Gypsum Board (White)
- Joint Compound associated with Gypsum (White)
- 2' x 4' Suspended Ceiling Tiles (White)
- Gypsum Board (White)
- Gypsum Board (Grey)
- Joint Compound associated with Gypsum Board (Yellow)
- Mortar associated with Cinder Block Walls
- Sidewalk Brick Expansion Joint Caulking (Grey)
- Mortar associated with Terrazzo Floor
- White Expansion Joint Caulking
- Mortar (Grey) associated with Block Wall
- Black Mastic associated with 12" x 12" VFT
- 12" x 12" Speckled Brown VFT
- Door Frame/Expansion Joint Caulking (Grey)
- Felt Paper (White) associated with Foam Insulation

The following materials **did not contain Asbestos as per 2019 AHERA Report:**

- Ceiling Plaster, Brown Coat (Girls Locker Room Shower)



Final Report for Environmental Inspection Services

- Mastic to 12"x12" Floor Tile, Black (Hall outside Loading Dock)
- 12"x12" Floor Tiles, White (Hall outside Loading Dock)
- Mastic to 4" Cove Base, Yellow (Hall outside Loading Dock)
- Drywall, White (Hall outside Loading Dock)
- Drywall, Gray (Custodians Office & Restroom)
- Mastic assoc. with Cork Board, Brown (Custodians Office)
- Cork Board, Brown (Custodians Office)

B. LEAD-BASED PAINT

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

- **Purple Paint to Wood Wall (Rooms 100, 103 & 104)**
- **Red Paint to Fiberglass Pipes (1st Floor, Hallways & Various Rooms)**

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

- Black Paint on Metal Pipe (Roof G)
- Red Paint on Metal Door (High School, Cafeteria)
- Red Paint on Metal Door Frame (High School, Cafeteria)
- Yellow Paint on Gypsum Wall (High School, Cafeteria)
- Yellow Paint on Brick Wall (High School, Cafeteria)
- Red Paint on Metal Window Frame (High School, Cafeteria)
- White Paint on Cinder Block Wall (Boiler Room)
- Blue Paint on Metal Cyclonic to Boiler Component (Boiler Room)
- Gray Paint on Concrete Boiler Footing (Boiler Room)
- Red Paint to Metal Door Frame (Room 134)
- Red Paint to Metal Door (Room 134)
- Black Paint to Vinyl Cove Base (Lockers by Room 133)
- Blue Paint to Metal Lockers (Lockers by Room 133)
- Blue Paint to Metal Bathroom Partition (G. Toile by Room 132)
- White Paint to Gypsum Ceiling (G. Toile by Room 133)
- Light Blue Paint to Metal Radiator (G. Toile by Room 133)
- Yellow Paint to Metal Vertical I Beam (Room 131)
- Black Paint to Wood Door Frame (Room 131)
- Yellow Paint to Gypsum Wall (Room 131)
- Black Paint to Metal Seats (Auditorium)
- Black Paint to Wood Bench (Auditorium)
- White Paint to Metal Railing (1st Floor, Stairs near Room 110)
- White Paint to Gypsum Ceiling (1st Floor, Stairs near Room 110)
- Gold Paint to Metal Conduit (1st Floor, Stairs near Room 110)
- Red Paint to Metal Sill (1st Floor, Stairs near Room 110)
- Yellow Paint to Gypsum Wall (Hall near Room 110)



- White Paint to Gypsum Ceiling (Chorus Room)
- Red Paint to Gypsum Wall (Chorus Room)
- Red Paint to Wood Handrail (Chorus Room)
- Red Paint to Metal Beam (Maresca Center)
- White Paint to Gypsum Wall (Maresca Center)
- Blue Paint to Gypsum Wall (Room 110)
- Red Paint to Wood Base Molding (Corridor by Room 110)
- Purple Paint to Metal Door Frame (Room 100)
- Purple Paint to Metal Vertical Beam (Room 100)
- White Paint to Metal Door Frame (Room 100)
- Purple Paint to Gypsum Wall (Room 102)
- Blue Paint to Cinder Block Wall (Room 121)
- Teal Paint to Gypsum Wall (Room 96)
- Blue Paint to Gypsum Wall (MS Cafeteria)
- White Paint to Metal Radiator (Room 90)
- Yellow Paint to Gypsum Wall (Room 210)
- Gray Paint to Gypsum Wall (2nd Floor, Hallway by Elec.)
- Black Paint to Wood Wall (MS Gym)
- Yellow Paint to Cinder Block Wall (Hall by HS Gym)
- White Paint to Metal Ceiling (Lockers by Room 113)
- Red Paint to Metal Ductwork (Lockers by Room 113)
- Purple Paint to Metal Beams (Lockers by Room 113)
- Black Paint to Wood Skylight (Lockers by Room 113)
- White Paint to Metal ceiling (Lockers by Room 113)
- Tan Paint to Metal Ductwork (MS Cafeteria)
- Tan Paint to Metal Ceiling (MS Cafeteria)

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):

- Window/Louver Caulking (Pink) (Exterior)
- Caulking (Gray) associated with Skylight (Roof G)
- Caulking (Beige) associated with AHU (Roof A)
- Caulking (Black) associated with metal façade panels (Exterior)
- Caulking (White) on metal cap flashing (Roof B & G)
- Expansion joint caulking (Gray) at Brick Wall (Roof K & Exterior adj. Art Rm 134)
- Caulking (White) associated with ductwork (Roof G)



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- Caulking (Black) associated with square skylight panels (Roof G)
- Caulking (Black) associated with metal cap flashing (Roof B)
- Sidewalk/Brick Expansion Joint Caulking (Gray) (Exterior)
- White Expansion Joint Caulking (Fuel/Oil Tank Enclosure)
- Expansion Joint Caulking (Brown) (Exterior)



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 than 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 is 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 Analyzer. 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 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 BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Briarcliff Middle/High School. Locations surveyed include:

- Roofs
- Exterior, Façade
- Interior, 1st & 2nd Floor, Various Locations

A. ASBESTOS-CONTAINING MATERIAL

Materials examined during the WSP this inspection included:

- Brick Mortar, Grey
- Brick Mortar, Pink
- Stone Mortar, Grey
- Tar (Black) on Foil Paper on Air Handling Units
- Caulking (Grey) on Skylight Panel
- Caulking (Beige) on AHU
- Pitch Pocket Sealant (Grey)
- Pitch Pocket Sealant (White)
- Vent Pipe Sealant (Grey)
- Caulking (Black) at Metal Façade Panels
- Caulking (White) at Metal Cap Flashing
- Expansion Joint Caulking (Grey) on Wall
- Gypsum (White) Roof Deck Material
- Fiberboard (Brown) Under EPDM Roofing
- Perlite (Tan) Insulation Under EPDM Roofing & Epoxy Roofing
- Fibrous insulation (Brown) Under EPDM Roofing
- Felt Paper (Black) Under EPDM Roofing
- Sealant (white) on Square Exhausts
- Tar (Black) at base of AHU Kerb
- Caulking (Black) at Square Skylight Panels
- Caulking (Black) at Metal Cap / Stone Wall
- Caulking (White) on Foil Paper AHU Seams
- Spray-On Fire Proofing on Beams
- Yellow Adhesive associated with Carpet Flooring
- 12"x12" Black Vinyl Floor Tiles
- Yellow Adhesive associated with 12"x12" Black Vinyl Floor Tiles
- Yellow Adhesive associated with Carpet Flooring
- Gypsum Board (White)
- Joint Compound associated with Gypsum (White)
- 2' x 4' Suspended Ceiling Tiles (White)



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- Gypsum Board (White)
- Joint Compound (Tan) associated with Gypsum Board
- Gypsum Board (Grey)
- Joint Compound associated with Gypsum Board (Yellow)
- Cementitious Material (White) at Roof Drain Bowl
- Mortar associated with Cinder Block Walls
- Sidewalk Brick Expansion Joint Caulking (Grey)
- Mortar associated with Terrazzo Floor
- White Expansion Joint Caulking
- Mortar (Grey) associated with Block Wall
- Black Mastic associated with 12" x 12" VFT
- 12" x 12" Speckled Brown VFT
- Door Frame/Expansion Joint Caulking (Grey)
- Felt Paper (White) associated with Foam Insulation
- Pipe Elbows

Analytical results of the bulk samples collected on 08/10/21, 08/13/21, 08/18/21 and 08/26/21 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **Tar (Black) at base of AHU Kerb**
- **Joint Compound (Tan) associated with Gypsum Board**
- **Cementitious Material (White) at Roof Drain Bowl**

The following materials **contain asbestos as per 2019 AHERA Report**

- **12"x12" White VAT w/ Gray Marble and Mastic**
- **12"x12" White VAT w/ Gray Specks and Mastic**
- **Mastic to 12"x12" Light Blue w/ Dark Blue VAT**
- **Mastic to 12"x12" Light Salmon w/ Dark Salmon VAT**
- **Sheetrock (Joint Compound Only)**
- **Mudded Joint Packing (Not Affected by SOW)**
- **Transite Table Top Beneath Hood (Not Affected by SOW)**
- **Pipe Elbows**
- **Ceiling Plaster, White Coat (Girls Locker Room Shower) (Not Affected by SOW)**

Analytical results of the bulk samples collected on 08/10/21, 08/13/21, 08/18/21 and 08/26/21 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Brick Mortar, Grey
- Brick Mortar, Pink
- Stone Mortar, Grey
- Tar (Black) on Foil Paper on Air Handling Units
- Caulking (Grey) on Skylight Panel
- Caulking (Beige) on AHU
- Pitch Pocket Sealant (Grey)



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- Pitch Pocket Sealant (White)
- Vent Pipe Sealant (Grey)
- Caulking (Black) at Metal Façade Panels
- Caulking (White) at Metal Cap Flashing
- Expansion Joint Caulking (Grey) on Wall
- Gypsum (White) Roof Deck Material
- Fiberboard (Brown) Under EPDM Roofing
- Perlite (Tan) Insulation Under EPDM Roofing & Epoxy Roofing
- Fibrous insulation (Brown) Under EPDM Roofing
- Felt Paper (Black) Under EPDM Roofing
- Sealant (white) on Square Exhausts
- Caulking (Black) at Square Skylight Panels
- Caulking (Black) at Metal Cap / Stone Wall
- Caulking (White) on Foil Paper AHU Seams
- Spray-On Fire Proofing on Beams
- Yellow Adhesive associated with Carpet Flooring
- 12"x12" Black Vinyl Floor Tiles
- Yellow Adhesive associated with 12"x12" Black Vinyl Floor Tiles
- Yellow Adhesive associated with Carpet Flooring
- Gypsum Board (White)
- Joint Compound associated with Gypsum (White)
- 2' x 4' Suspended Ceiling Tiles (White)
- Gypsum Board (White)
- Gypsum Board (Grey)
- Joint Compound associated with Gypsum Board (Yellow)
- Mortar associated with Cinder Block Walls
- Sidewalk Brick Expansion Joint Caulking (Grey)
- Mortar associated with Terrazzo Floor
- White Expansion Joint Caulking
- Mortar (Grey) associated with Block Wall
- Black Mastic associated with 12" x 12" VFT
- 12" x 12" Speckled Brown VFT
- Door Frame/Expansion Joint Caulking (Grey)
- Felt Paper (White) associated with Foam Insulation

The following materials **did not contain Asbestos as per 2019 AHERA Report:**

- Ceiling Plaster, Brown Coat (Girls Locker Room Shower)
- Mastic to 12"x12" Floor Tile, Black (Hall outside Loading Dock)
- 12"x12" Floor Tiles, White (Hall outside Loading Dock)
- Mastic to 4" Cove Base, Yellow (Hall outside Loading Dock)
- Drywall, White (Hall outside Loading Dock)
- Drywall, Gray (Custodians Office & Restroom)
- Mastic assoc. with Cork Board, Brown (Custodians Office)
- Cork Board, Brown (Custodians Office)



B. LEAD-BASED PAINT

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

- **Purple Paint to Wood Wall (Rooms 100, 103 & 104)**
- **Red Paint to Fiberglass Pipes (1st Floor, Hallways & Various Rooms)**

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

- Black Paint on Metal Pipe (Roof G)
- Red Paint on Metal Door (High School, Cafeteria)
- Red Paint on Metal Door Frame (High School, Cafeteria)
- Yellow Paint on Gypsum Wall (High School, Cafeteria)
- Yellow Paint on Brick Wall (High School, Cafeteria)
- Red Paint on Metal Window Frame (High School, Cafeteria)
- White Paint on Cinder Block Wall (Boiler Room)
- Blue Paint on Metal Cyclonic to Boiler Component (Boiler Room)
- Gray Paint on Concrete Boiler Footing (Boiler Room)
- Red Paint to Metal Door Frame (Room 134)
- Red Paint to Metal Door (Room 134)
- Black Paint to Vinyl Cove Base (Lockers by Room 133)
- Blue Paint to Metal Lockers (Lockers by Room 133)
- Blue Paint to Metal Bathroom Partition (G. Toilets by Room 132)
- White Paint to Gypsum Ceiling (G. Toilets by Room 133)
- Light Blue Paint to Metal Radiator (G. Toilets by Room 133)
- Yellow Paint to Metal Vertical I Beam (Room 131)
- Black Paint to Wood Door Frame (Room 131)
- Yellow Paint to Gypsum Wall (Room 131)
- Black Paint to Metal Seats (Auditorium)
- Black Paint to Wood Bench (Auditorium)
- White Paint to Metal Railing (1st Floor, Stairs near Room 110)
- White Paint to Gypsum Ceiling (1st Floor, Stairs near Room 110)
- Gold Paint to Metal Conduit (1st Floor, Stairs near Room 110)
- Red Paint to Metal Sill (1st Floor, Stairs near Room 110)
- Yellow Paint to Gypsum Wall (Hall near Room 110)
- White Paint to Gypsum Ceiling (Chorus Room)
- Red Paint to Gypsum Wall (Chorus Room)
- Red Paint to Wood Handrail (Chorus Room)
- Red Paint to Metal Beam (Maresca Center)
- White Paint to Gypsum Wall (Maresca Center)
- Blue Paint to Gypsum Wall (Room 110)
- Red Paint to Wood Base Molding (Corridor by Room 110)



- Purple Paint to Metal Door Frame (Room 100)
- Purple Paint to Metal Vertical Beam (Room 100)
- White Paint to Metal Door Frame (Room 100)
- Purple Paint to Gypsum Wall (Room 102)
- Blue Paint to Cinder Block Wall (Room 121)
- Teal Paint to Gypsum Wall (Room 96)
- Blue Paint to Gypsum Wall (MS Cafeteria)
- White Paint to Metal Radiator (Room 90)
- Yellow Paint to Gypsum Wall (Room 210)
- Gray Paint to Gypsum Wall (2nd Floor, Hallway by Elec.)
- Black Paint to Wood Wall (MS Gym)
- Yellow Paint to Cinder Block Wall (Hall by HS Gym)
- White Paint to Metal Ceiling (Lockers by Room 113)
- Red Paint to Metal Ductwork (Lockers by Room 113)
- Purple Paint to Metal Beams (Lockers by Room 113)
- Black Paint to Wood Skylight (Lockers by Room 113)
- White Paint to Metal ceiling (Lockers by Room 113)
- Tan Paint to Metal Ductwork (MS Cafeteria)
- Tan Paint to Metal Ceiling (MS Cafeteria)

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):

- Window/Louver Caulking (Pink) (Exterior)
- Caulking (Gray) associated with Skylight (Roof G)
- Caulking (Beige) associated with AHU (Roof A)
- Caulking (Black) associated with metal façade panels (Exterior)
- Caulking (White) on metal cap flashing (Roof B & G)
- Expansion joint caulking (Gray) at Brick Wall (Roof K & Exterior adj. Art Rm 134)
- Caulking (White) associated with ductwork (Roof G)
- Caulking (Black) associated with square skylight panels (Roof G)
- Caulking (Black) associated with metal cap flashing (Roof B)
- Sidewalk/Brick Expansion Joint Caulking (Gray) (Exterior)
- White Expansion Joint Caulking (Fuel/Oil Tank Enclosure)
- Expansion Joint Caulking (Brown) (Exterior)



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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 Roof Replacement project at the Briarcliff Middle/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 08/10/2021, 08/13/2021, 08/18/2021 & 08/26/21			
A	Exterior	Brick Mortar, Grey	NAD
B	Exterior	Brick Mortar, Pink	NAD
C	Exterior	Stone Mortar, Grey	NAD
D	Roof B & G	Tar (Black) on Foil Paper on Air Handling Units	NAD
E	Roof G	Caulking (Grey) on Skylight Panel	NAD
F	Roof A & B	Caulking (Beige) on Skylight Panel & AHUs	NAD
G	Roof F, G & H	Pitch Pocket Sealant (Grey)	NAD
H	Roof E & F	Pitch Pocket Sealant (White)	NAD
I	Roof H & J	Vent Pipe Sealant (Grey)	NAD
J	Exterior	Caulking (Black) at Metal Façade Panels	NAD
K	Roof G	Caulking (White) at Metal Cap Flashing	NAD
L	Roof K	Expansion Joint Caulking (Grey) on Wall	NAD
M	Roof A	Gypsum (White) Roof Deck Material	NAD
N	Roof A, B, F, H & K	Fiberboard (Brown) Under EPDM Roofing	NAD
O	Roof F, G & J	Perlite (Tan) Insulation Under EPDM Roofing	NAD
P	Roof K & H	Fibrous insulation (Brown) Under EPDM Roofing	NAD
Q	Roof G	Felt Paper (Black) Under EPDM Roofing	NAD
R	Roof C	Sealant (white) on Square Exhausts	NAD
S	Roof A, B, E & G	Tar (Black) at Base of AHU (Air Handling Unit) Curbs under EPDM Roofing	7.4% Chrysotile



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HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
T	Roof G	Caulking (Black) at Square Skylight Panels	NAD
U	Roof B	Caulking (Black) at Metal Cap / Stone Wall	NAD
V	Roof B & G	Caulking (White) on Foil Paper AHU Seams	NAD
W	Air Handling Room (MS)	Spray-On Fire Proofing on Beams	NAD
X	Music Room 90	Yellow Adhesive associated with Carpet Flooring	NAD
Y	Auditorium (HS)	12"x12" Black Vinyl Floor Tiles	NAD
Z	Auditorium (HS)	Yellow Adhesive associated with 12"x12" Black Vinyl Floor Tiles	NAD
AA	Auditorium (HS)	Yellow Adhesive associated with Carpet Flooring	NAD
AB	Library (MS) & Art Room 121 (HS)	Gypsum Board (White)	NAD
AC	Library (MS) & Art Room 121 (HS)	Joint Compound associated with Gypsum (White)	NAD
AD	Throughout	2' x 4' Suspended Ceiling Tiles (White)	NAD
AE	Chorus Room 108 & Maresca Center	Gypsum Board (White)	Asbestos Contaminated
AF	Chorus Room 108 & Maresca Center	Joint Compound (tan) associated with Gypsum Board (White)	1.1% Chrysotile
AE	1 st Floor & 2 nd Floor, Various Rooms	Gypsum Board (White)	Asbestos Contaminated
AF		Joint Compound (tan) associated with Gypsum Board (White)	1.1% Chrysotile
AG	Band Room 131	Gypsum Board (Grey)	NAD
AH	Band Room 131	Joint Compound associated with Gypsum Board (Yellow)	Trace (<1%) Chrysotile
AI	A-Wing & C-Wing Ceiling Above Boys & Girls Toilets	Cementitious Material (White) at Roof Drain Bowls	4.1% Chrysotile
AJ	Interior – Throughout	Mortar associated with Cinder Block Walls	NAD
AK	Exterior – Throughout	Sidewalk Brick Expansion Joint Caulking (Grey)	NAD
AL	Stairs	Mortar associated with Terrazzo Floor	NAD
AM	Fuel Tank/Electrical Enclosure - Outside Wall	White Expansion Joint Caulking	NAD
AN	Interior – Throughout	Mortar (Grey) associated with Block Wall	NAD



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HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
AO	1 st Floor, Various Rooms	Black Mastic associated with 12” x 12” VFT	NAD
AP	1 st Floor, Various Rooms	12” x 12” Speckled Brown VFT	NAD
AQ	Exterior	Door Frame/Expansion Joint Caulking (Grey)	NAD
AR	Roof G	Felt Paper (White) associated with Foam Insulation	NAD
-	Boiler Room	Metal Ceiling	Non-Suspect
-		Fiberglass Insulated Pipes & Ducts	Non-Suspect
-	Exterior at Stage Exit	Metal handrail (No Caulking)	Non-Suspect
-		Concrete Ramp	Non-Suspect
-	M.S & H.S Front Entry Vestibules	Metal doors with foam window glazing	Non-Suspect
-	M.S. Cafeteria	Metal Ductwork (No Insulation)	Non-Suspect
-		Metal Ceiling	Non-Suspect
As Per 2019 AHERA Report			
01 & 02	1 st Floor, Various Rooms – HS Stairs (4), Maresca Center, A-Wing Hallway (Locker Area) C-Wing Hallway (Locker Area)	12”x12” Floor Tile (White w/ gray marble/specks) and Associated Mastic	ACM
03	Interior, Various Rooms	Mastic to 12”x12” Floor Tile (Light Blue w/Dark Blue VAT) ¹	ACM ¹
04	Interior, Various Rooms	Mastic to 12”x12” Floor Tile (Light Salmon w/Dark Salmon VAT) ¹	ACM ¹
08	A-Wing & C-Wing Ceiling Above Boys & Girls Toilets	Pipe Elbows	ACM
08	1 st Floor, Interior, Various Rooms	Pipe Elbows ¹	ACM ¹

Bold = Positive for ACM

NAD = No Asbestos Detected

NA/PS = Not analyzed/ positive sample



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4.2 CONDITION AND FRIABILITY 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	Notes
Roofs A, B, E & G	Tar (Black) at base of AHU Curbs (Under EPDM Roofing)	900 SF	Non-Friable	Good	
Chorus Room & Maresca Center	Joint Compound (tan) associated with Gypsum Board	*See Notes	Friable	Good	*Quantity to be impacted TBD by SOW
1st & 2nd Floor, Various Rooms	*Joint Compound (tan) associated with Gypsum Board	*See Notes	Friable	Good	
HS Stairs (4)	12"x12" Floor Tile (White w/ gray marble/specks) and Associated Mastic	920 SF	Non-Friable	Good	1st & 2nd Floor, 230SF per stairway
Maresca Center	12"x12" Floor Tile (White w/ gray marble/specks) and Associated Mastic	1,800 SF	Non-Friable	Good	
A-Wing Hallway (Locker Area)		6,200 SF	Non-Friable	Good	
C-Wing Hallway (Locker Area)	12"x12" Floor Tile (White w/ gray marble/specks) and Associated Mastic	5,950 SF	Non-Friable	Good	
A-Wing & C-Wing Ceiling Above Boys & Girls Toilets	Cementitious Material (White) at Roof Drain Bowl	20 SF	Friable	Good	5 SF Per Location (4 drains)
	Pipe Elbows	20 LF	Friable	Good	At radiator Pipes & (4 drains)

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.



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B. LEAD-BASED PAINT

The lead Inspection involved a thorough visual examination of all accessible areas impacted by the proposed BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Briarcliff Middle/High School. The following suspect surfaces were tested for lead content:

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm²)
WSP Surveyed on 8/10/2021						
1	Calibration Check @ 1.0	---	---	---	---	1.0
2	Calibration Check @ 1.0	---	---	---	---	1.0
3	Calibration Check @ 1.0	---	---	---	---	1.0
4	Calibration Check @ 0.0	---	---	---	---	0.0
5	Calibration Check @ 0.0	---	---	---	---	0.1
6	Calibration Check @ 0.0	---	---	---	---	0.1
7	Calibration Check @ 1.0	---	---	---	---	0.9
8	Calibration Check @ 1.0	---	---	---	---	1.1
9	Calibration Check @ 1.0	---	---	---	---	1.0
10	Calibration Check @ 0.0	---	---	---	---	0.0
11	Calibration Check @ 0.0	---	---	---	---	0.0
12	Calibration Check @ 0.0	---	---	---	---	0.0
13	Roof G	Pipe	Black	Metal	Good	0.1
14	Calibration Check @ 1.0	---	---	---	---	1.1
15	Calibration Check @ 1.0	---	---	---	---	1.1
16	Calibration Check @ 1.0	---	---	---	---	1.1
17	Calibration Check @ 0.0	---	---	---	---	0.0
18	Calibration Check @ 0.0	---	---	---	---	0.0
19	Calibration Check @ 0.0	---	---	---	---	-0.1



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Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
WSP Surveyed on 8/26/2021						
1	Calibration Check @ 1.0	---	---	---	---	1.1
2	Calibration Check @ 1.0	---	---	---	---	1.1
3	Calibration Check @ 1.0	---	---	---	---	1.1
4	Calibration Check @ 0.0	---	---	---	---	0.0
5	Calibration Check @ 0.0	---	---	---	---	0.0
6	Calibration Check @ 0.0	---	---	---	---	-0.1
7	High School Cafeteria	Door	Red	Metal	Good	0
8	High School Cafeteria	Door Frame	Red	Metal	Good	0.2
9	High School Cafeteria	Wall	Yellow	Gypsum	Fair	0.1
10	High School Cafeteria	Wall	Yellow	Brick	Fair	0.2
11	High School Cafeteria	Window Frame	Red	Metal	Good	0.2
12	Boiler Room	Wall	White	Cinderblock	Good	0.1
13	Boiler Room	Cyclometric to Boiler	Blue	Metal	Good	0.1
14	Boiler Room	Boiler Footing	Gray	Concrete	Good	0.1
15	Room 134	Door Frame	Red	Metal	Good	0.1
16	Room 134	Door	Red	Metal	Good	0.0
17	Lockers by 133	Cove Base	Black	Vinyl	Fair	0.2
18	Lockers by 133	Lockers	Blue	Metal	Fair	0.1
19	Girls Toilet by 132	Bathroom Partition	Blue	Metal	Fair	0.0
20	Girls Toilet by 132	Ceiling	White	Gypsum	Good	0.1
21	Girls Toilet by 132	Radiator	Light Blue	Metal	Good	0.1
22	Room 131	Vertical I Beam	Yellow	Metal	Good	0.5
23	Room 131	Door Frame	Black	Vinyl	Fair	0.3
24	Room 131	Wall	Yellow	Gypsum	Good	0.2
25	Auditorium	Seats	Black	Metal	Good	0.2



Final Report for Environmental Inspection Services

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
26	Auditorium	Bench	Black	Wood	Good	0.0
27	Stairs near 110	Railing	White	Metal	Good	0.4
28	Stairs near 110	Ceiling	White	Gypsum	Fair	0.1
29	Stairs near 110	Conduit	Gold	Metal	Good	0.7
30	Stairs near 110	Sill	Red	Metal	Good	0.0
31	Hall near 110	Wall	Yellow	Gypsum	Good	0.1
32	Chorus Room	Ceiling	White	Gypsum	Good	0.2
33	Chorus Room	Wall	Red	Gypsum	Good	0.1
34	Chorus Room	Handrail	Red	Wood	Good	0.0
35	Maresca Center	Beam	Red	Metal	Good	0.5
36	Maresca Center	Wall	White	Gypsum	Fair	0.1
37	Room 110	Wall	Blue	Gypsum	Good	0.2
38	Corridor by 110	Base Molding	Red	Wood	Good	0.2
39	Room 100	Door Frame	Purple	Metal	Good	0
40	Room 100	Wall	Purple	Wood	Good	1.2
41	Room 100	Vertical Beam	Purple	Metal	Good	0.5
42	Room 100	Door Frame	White	Metal	Fair	0.1
43	Room 102	Wall	Purple	Gypsum	Good	0.1
44	Room 121	Wall	Blue	Cinderblock	Good	-0.1
45	Room 96	Wall	Teal	Gypsum	Good	0.2
46	MS Cafeteria	Wall	Blue	Gypsum	Good	0.1
47	Room 90	Radiator	White	Metal	Good	0.2
48	Room 210	Wall	Yellow	Gypsum	Fair	0.1
49	Hallway by 2nd FL MS Electrical Room	Wall	Gray	Gypsum	Good	0.0
50	MS Gym	Wall	Black	Wood	Good	-0.3
51	Hall by MS Gym	Wall	Yellow	Cinderblock	Good	-0.1
52	Hall by HS Gym	Wall	Yellow	Wood	Good	0.1
53	Lockers by 113	Ceiling	White	Metal	Good	0.1
54	Lockers by 113	Ductwork	Red	Metal	Good	0.6
55	Lockers by 113	Pipe	Red	Fiberglass	Good	1.0
56	Lockers by 113	Beam	Purple	Metal	Good	0.4
57	Lockers by 113	Skylight	Black	Wood	Good	0



Final Report for Environmental Inspection Services

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm ²)
58	Lockers by 113	Ceiling	White	Metal	Good	0.1
59	MS Cafeteria	Ductwork	Tan	Metal	Good	0
60	MS Cafeteria	Ceiling	Tan	Metal	Fair	0
61	Calibration Check @ 1.0	---	---	---	---	1.1
62	Calibration Check @ 1.0	---	---	---	---	1.1
63	Calibration Check @ 1.0	---	---	---	---	1.1
64	Calibration Check @ 0.0	---	---	---	---	0
65	Calibration Check @ 0.0	---	---	---	---	0.1
66	Calibration Check @ 0.0	---	---	---	---	0

C. PCB-CONTAINING MATERIAL

The PCB Inspection involved a thorough visual examination of all areas that may be impacted by the proposed BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Briarcliff Middle/High School. The following suspect materials were tested for PCB content:

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	PCB CONTENT (PPM)
A	Exterior	Window/Louver Caulking (Pink)	ND
B	Roof G	Caulking (Gray) assoc. w/ skylight	ND
C	Roof A & B	Caulking (Beige) assoc. w/ AHU	ND
D	Exterior	Caulking (Black) assoc. w/ Metal façade panels	ND
E	Roof B & G	Caulking (White) on Metal Cap Flashing	ND
F	Exterior	Expansion Joint Caulking (Gray) at Brick Wall	ND
G	Exterior	Sidewalk/Brick Expansion Joint Caulking (Gray)	ND
H	Roof G	Caulking (White) assoc. w/ ductwork	ND
I	Roof G	Caulking (Black) assoc. w/ square skylight panels	ND
J	Roof B	Caulking (Black) assoc. w/ metal cap flashing	ND



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HOMOGENOUS MATERIAL	LOCATION	MATERIAL	PCB CONTENT (PPM)
K	Fuel/Oil Enclosure – Outside Wall	White Expansion Joint Caulking	ND
L	Exterior	Expansion Join Caulking (Brown)	ND

Bold = Positive for PCB

ND = No PCB Detected

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 and LBP have been identified in this inspection that may be impacted as part of the proposed BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Briarcliff Middle/High School. These materials reported in Section 3.0 of this report, may require complete removal prior to the start of the BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project.

No PCB was identified in this inspection that may be impacted as part of the proposed BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Briarcliff Middle/High School.

The ACM, LBP & PCB inspection was conducted at the request of Briarcliff Manor Union Free School District for the proposed BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Briarcliff Middle/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.



Final Report for Environmental Inspection Services

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 Briarcliff Middle/High School.

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:

A handwritten signature in black ink, appearing to be 'S. Gruber', written over a horizontal line.

Stephen Gruber
NYS DOL Inspector

Reviewed by:

A handwritten signature in blue ink, appearing to be 'C. Napolitano', written over a horizontal line.

Craig Napolitano, CHMM
Vice President, Emergency
Management & IH Services



**APPENDIX A:
ASBESTOS SAMPLE ANALYSIS RESULTS IN TABULAR FORM**



Final Report for Environmental Inspection Services

APPENDIX A
SAMPLE ANALYSIS RESULTS IN TABULAR FORM
BRIARCLIFF HIGH/MIDDLE SCHOOL
444 PLEASANTVILLE ROAD
BRIARCLIFF MANOR, NY 10510

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
WSP Sampled on 08/10/2021 8/13/2021 & 08/18/2021					
A	01	Exterior – North	Brick Mortar, Grey	NAD	NAD
	02	Exterior - South		NAD	NAD
B	03	Exterior - North	Brick Mortar, Pink	NAD	NAD
	04	Exterior - South		NAD	NAD
C	05	Exterior - Northeast	Stone Mortar, Grey	NAD	NAD
	06	Exterior – Northwest		NAD	NAD
D	07	Roof B	Tar (Black) on Foil Paper on Air Handling Units	NAD	NAD
	08	Roof G		NAD	NAD
E	09	Roof G	Caulking (Grey) on Skylight Panel	NAD	NAD
	10			NAD	NAD
F	11	Roof A	Caulking (Beige) on AHU	NAD	NAD
	12			NAD	NAD
G	13	Roof H	Pitch Pocket Sealant (Grey)	NAD	NAD
	14	Roof G		NAD	NAD
H	15	Roof E	Pitch Pocket Sealant (White)	NAD	NAD
	16	Roof F		NAD	NAD
I	17	Roof H	Vent Pipe Sealant (Grey)	NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected

N/A = Not Applicable
NA/PS = Not analyzed/ positive sample



Final Report for Environmental Inspection Services

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
I	18	Roof J	Vent Pipe Sealant (Grey)	NAD	NAD
J	19	Roof K	Caulking (Black) at Metal Façade Panels	NAD	NAD
	20	Roof G		NAD	NAD
K	21	Roof G	Caulking (White) at Metal Cap Flashing	NAD	NAD
	22			NAD	NAD
L	23	Roof K	Expansion Joint Caulking (Grey) on Wall	NAD	NAD
	24			NAD	NAD
M	25	Roof A	Gypsum (White) Roof Deck Material	NAD	NAD
	26			NAD	NAD
N	27	Roof A	Fiberboard (Brown) Under EPDM Roofing	NAD	NAD
	28	Roof B		NAD	NAD
O	29	Roof J	Perlite (Tan) Insulation Under EPDM Roofing	NAD	NAD
	30	Roof F		NAD	NAD
P	31	Roof K	Fibrous insulation (Brown) Under EPDM Roofing	NAD	NAD
	32	Roof H		NAD	NAD
Q	33	Roof G	Felt Paper (Black) Under EPDM Roofing	NAD	NAD
	34			NAD	NAD
R	35	Roof C	Sealant (white) on Square Exhausts	NAD	NAD
	36			NAD	NAD
S	37	Roof G	Tar (Black) at Base of AHU Curb	7.4% Chrysotile	NA/PS
	38			NA/PS	NA/PS
T	39	Roof G	Caulking (Black) at Square	NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected

N/A = Not Applicable
NA/PS = Not analyzed/ positive sample



Final Report for Environmental Inspection Services

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
T	40	Roof G	Skylight Panels	NAD	NAD
U	41	Roof B	Caulking (Black) at Metal Cap / Stone Wall	NAD	NAD
	42			NAD	NAD
V	43	Roof G	Caulking (White) on Foil Paper AHU Seams	NAD	NAD
	44			NAD	NAD
O	45	Roof J	Perlite (Tan) Insulation Under Epoxy Roofing	NAD	NAD
W	46	Air Handling Room (MS)	Spray-On Fire Proofing on Beams	NAD	NAD
	47			NAD	NAD
	48			NAD	NAD
X	49	Music Room 90	Yellow Adhesive associated with Carpet Flooring	NAD	NAD
	50			NAD	NAD
Y	51	Auditorium (HS)	12"x12" Black Vinyl Floor Tiles	NAD	NAD
	52			NAD	NAD
Z	53		Yellow Adhesive associated with 12"x12" Black Vinyl Floor Tiles	NAD	NAD
	54			NAD	NAD
AA	55		Yellow Adhesive associated with Carpet Flooring	NAD	NAD
	56			NAD	NAD
AB	57	Library (MS)	Gypsum Board (White)	NAD	NAD
	58	Art Room 121 (HS)	Gypsum Board (White)	NAD	NAD
AC	59	Library (MS)	Joint Compound associated with Gypsum (White)	NAD	NAD
	60	Art Room 121 (HS)	Joint Compound associated with Gypsum (White)	NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected

N/A = Not Applicable
NA/PS = Not analyzed/ positive sample



Final Report for Environmental Inspection Services

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
AD	61	Chorus Room 108	2' x 4' Suspended Ceiling Tiles (White)	NAD	NAD
	62	Maresca Center		NAD	NAD
AE	63	Chorus Room 108	Gypsum Board (White)	NAD	NAD
	64	Maresca Center		NAD	NAD
AF	65	Chorus Room 108	Joint Compound associated with Gypsum Board (White)	1.1% Chrysotile	NA/PS
	66	Maresca Center		NA/PS	NA/PS
AG	67	Band Room 131	Gypsum Board (Grey)	NAD	NAD
	68			NAD	NAD
AH	69		Joint Compound associated with Gypsum Board (Yellow)	Trace (<1%) Chrysotile	N/A
	70			Trace (<1%) Chrysotile	N/A
AI	71	Girls' Toilet Ceiling / Roof Area adjacent to Room 108	Cementitious Material (White) at Roof Drain Bowl	4.1% Chrysotile	N/A
	72	Boys' Toilet Ceiling / Roof Area adjacent to Nurse		NA/PS	N/A
AJ	73	Art Room 121	Mortar associated with Cinder Block Walls	NAD	NAD
	74			NAD	NAD
AK	75	Exterior – adjacent to MS Cafeteria	Sidewalk Brick Expansion Joint Caulking (Grey)	NAD	NAD
	76			NAD	NAD
AL	77	Stairs by Room 110	Mortar associated with Terrazzo Floor	NAD	NAD
	78	Stairs by Room 115		NAD	NAD
WSP Sampled on 08/26/2021					
AM	79	Fuel Tank / Electrical Enclosure – Outside Wall	White Expansion Joint Caulking	NAD	NAD

Bold = Positive for ACM
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N/A = Not Applicable
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Final Report for Environmental Inspection Services

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
AM	80	Fuel Tank / Electrical Enclosure – Outside Wall	White Expansion Joint Caulking	NAD	NAD
AN	81	MS Gym	Mortar (Grey) associated with Block Wall	NAD	N/A
	82	Room 96		NAD	N/A
AO	83	Prep Room adjacent to Room 101	Black Mastic associated with 12” x 12” VFT	NAD	NAD
	84			NAD	NAD
AP	85		12” x 12” Speckled Brown VFT	NAD	NAD
	86			NAD	NAD
AQ	87	Exterior adjacent to Art Room 134	Door Frame/Expansion Joint Caulking (Grey)	NAD	NAD
	88			NAD	NAD
AR	89	Roof G	Felt Paper (White) associated with Foam Insulation	NAD	NAD
	90			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
Collected by: Client
Project Name/No.: Briarcliff Manor UFSD / 31403475.004
Project Address: Briarcliff Manor HSMS
Work Area: Roof

Lab ID: BK0821370
Date Received: 8/23/2021
PLM Date Analyzed: 8/24/2021
TEM Date Analyzed: 8/26/2021
Report Date: 8/26/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
A01	BK0821370-1	Exterior - North / Brick Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
A02	BK0821370-2	Exterior - South / Brick Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
B03	BK0821370-3	Exterior - North / Brick Mortar (Pink)	Red, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
B04	BK0821370-4	Exterior - South / Brick Mortar (Pink)	Red, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
C05	BK0821370-5	Exterior- NE / Stone Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
C06	BK0821370-6	Exterior- NW / Stone Mortar (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
D07	BK0821370-7	Roof B - Tar (Black) on Foil Paper on Air Handling Units	Black, Homogeneous, Non-Fibrous	92.4	1.9	5.6	0%	100%	NAD Inconclusive	NAD
D08	BK0821370-8	Roof G - Tar (Black) on Foil Paper on Air Handling Units	Black, Homogeneous, Non-Fibrous	46.2	2.0	51.8	0%	100%	NAD Inconclusive	NAD
E09	BK0821370-9	Roof G - Caulking (Grey) on Skylight Panel	Grey, Homogeneous, Non-Fibrous	10.7	9.7	79.6	0%	100%	NAD Inconclusive	NAD
E10	BK0821370-10	Roof G - Caulking (Grey) on Skylight Panel	Grey, Homogeneous, Non-Fibrous	13.0	10.6	76.4	0%	100%	NAD Inconclusive	NAD



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Report Date: 8/26/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
F11	BK0821370-11	Roof A - Caulking (Beige) on AHV	Beige, Homogeneous, Non-Fibrous	73.8	3.2	22.9	0%	100%	NAD Inconclusive	NAD
F12	BK0821370-12	Roof A - Caulking (Beige) on AHV	Beige, Homogeneous, Non-Fibrous	72.8	3.4	23.8	0%	100%	NAD Inconclusive	NAD
G13	BK0821370-13	Roof H - Pitch Pocket Sealant (Grey)	Grey, Homogeneous, Non-Fibrous	64.9	5.8	29.3	0%	100%	NAD Inconclusive	NAD
G14	BK0821370-14	Roof G - Pitch Pocket Sealant (Grey)	Grey, Homogeneous, Non-Fibrous	64.1	1.4	34.5	0%	100%	NAD Inconclusive	NAD
H15	BK0821370-15	Roof E - Pitch Pocket Sealant (White)	White, Homogeneous, Non-Fibrous	65.2	5.6	29.2	0%	100%	NAD Inconclusive	NAD
H16	BK0821370-16	Roof F - Pitch Pocket Sealant (White)	White, Homogeneous, Non-Fibrous	77.7	5.5	16.9	0%	100%	NAD Inconclusive	NAD
I17	BK0821370-17	Roof H - Vent Pipe Sealant (Grey)	Grey, Homogeneous, Non-Fibrous	36.3	13.7	50.0	0%	100%	NAD Inconclusive	NAD
I18	BK0821370-18	Roof J - Vent Pipe Sealant (Grey)	Grey, Homogeneous, Non-Fibrous	56.6	14.9	28.5	0%	100%	NAD Inconclusive	NAD
J19	BK0821370-19	Roof K - Caulking (Black) at Metal Façade Panels	Black, Homogeneous, Non-Fibrous	72.2	2.4	25.4	0%	100%	NAD Inconclusive	NAD
J20	BK0821370-20	Roof G - Metal Façade Panels Caulking (White) at Metal cap Flashing	Black, Homogeneous, Non-Fibrous	70.9	2.4	26.7	0%	100%	NAD Inconclusive	NAD



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Work Area: Roof

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Date Received: 8/23/2021
PLM Date Analyzed: 8/24/2021
TEM Date Analyzed: 8/26/2021
Report Date: 8/26/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	AII%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
K21	BK0821370-21	Roof G - Metal Façade Panels Caulking (White) at Metal cap Flashing	White, Homogeneous, Non-Fibrous	43.0	7.6	49.5	0%	100%	NAD Inconclusive	NAD
K22	BK0821370-22	Roof G - Metal Façade Panels Caulking (White) at Metal cap Flashing	White, Homogeneous, Non-Fibrous	43.6	10.8	45.6	0%	100%	NAD Inconclusive	NAD
L23	BK0821370-23	Roof K - Expansion Joint Caulking (Grey) on Wall	Grey, Homogeneous, Non-Fibrous	44.8	26.8	28.4	0%	100%	NAD Inconclusive	NAD
L24	BK0821370-24	Roof K - Expansion Joint Caulking (Grey) on Wall	Grey, Homogeneous, Non-Fibrous	44.0	13.1	42.9	0%	100%	NAD Inconclusive	NAD
M25	BK0821370-25	Roof A - Gypsum (White) Roof Deck Material	White, Homogeneous, Friable	Not Applicable			10%FBGL	90%	NAD	
M26	BK0821370-26	Roof A - Gypsum (White) Roof Deck Material	White, Homogeneous, Friable	Not Applicable			10%FBGL	90%	NAD	
N27	BK0821370-27	Roof A - Fiberboard (Brown) under EPDM Roofing	Brown, Homogeneous, Friable	Not Applicable			95%CELL	5%	NAD	
N28	BK0821370-28	Roof B - Fiberboard (Brown) under EPDM Roofing	Brown, Homogeneous, Friable	Not Applicable			95%CELL	5%	NAD	
O29	BK0821370-29	Roof J - Perlite (Tan) Insulation under EPDM Roofing	Grey, Homogeneous, Friable	Not Applicable			30%CELL 20%Foam	50%	NAD	
O30	BK0821370-30	Roof F - Perlite (Tan) Insulation under EPDM Roofing	Grey, Homogeneous, Friable	Not Applicable			30%CELL 20%Foam	50%	NAD	



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Work Area: Roof

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Date Received: 8/23/2021
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TEM Date Analyzed: 8/26/2021
Report Date: 8/26/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	AII%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
P31	BK0821370-31	Roof K - Fibrous Insulation (Brown) under EPDM Roofing	Brown, Homogeneous, Friable	Not Applicable			95%Wood	5%	NAD	
P32	BK0821370-32	Roof H - Perlite (Tan) Insulation under EPDM Roofing	Brown, Homogeneous, Friable	Not Applicable			95%Wood	5%	NAD	
Q33	BK0821370-33	Roof G - Felt Paper (Black) under EPDM Roofing	Black, Homogeneous, Non-Fibrous	96.6	1.1	2.4	0%	100%	NAD Inconclusive	NAD
Q34	BK0821370-34	Roof G - Felt Paper (Black) under EPDM Roofing	Black, Homogeneous, Non-Fibrous	93.8	2.5	3.7	0%	100%	NAD Inconclusive	NAD
R35	BK0821370-35	Roof C - Sealant (White) on Square Exhaust	White, Homogeneous, Non-Fibrous	33.7	4.5	61.8	0%	100%	NAD Inconclusive	NAD
R36	BK0821370-36	Roof C - Sealant (White) on Square Exhaust	White, Homogeneous, Non-Fibrous	36.6	2.1	61.4	0%	100%	NAD Inconclusive	NAD
S37	BK0821370-37	Roof G - Tan (Black) at Base of AHU Herb	Black, Homogeneous, Non-Fibrous	60.3	12.9	26.8	0%	92.6%	7.4%CHRY	Not Analyzed
S38	BK0821370-38	Roof G - Tan (Black) at Base of AHU Herb	Black, Homogeneous, Non-Fibrous	66.5	9.0	24.5			NA/PS	Not Analyzed
T39	BK0821370-39	Roof G - Caulking (Black) at Square Skylight Panels	Black, Homogeneous, Non-Fibrous	70.7	14.5	14.8	0%	100%	NAD Inconclusive	NAD
T40	BK0821370-40	Roof G - Caulking (Black) at Square Skylight Panels	Black, Homogeneous, Non-Fibrous	68.1	16.4	15.6	0%	100%	NAD Inconclusive	NAD



Atlas Environmental Lab, Corp.
 255 West 36th Street, Suite# 1503
 New York, NY 10018
 Phone:(212) 563-0400 Fax:(212) 563-0401
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Bulk Asbestos Report by PLM-TEM

Client: WSP
Collected by: Client
Project Name/No.: Briarcliff Manor UFSD / 31403475.004
Project Address: Briarcliff Manor HSMS
Work Area: Roof

Lab ID: BK0821370
Date Received: 8/23/2021
PLM Date Analyzed: 8/24/2021
TEM Date Analyzed: 8/26/2021
Report Date: 8/26/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	AII%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
U41	BK0821370-41	Roof B (North Side) - Caulking (Black) at Metal Cap / Stone Wall	Black, Homogeneous, Non-Fibrous	41.6	4.3	54.1	0%	100%	NAD Inconclusive	NAD
U42	BK0821370-42	Roof B (North Side) - Caulking (Black) at Metal Cap / Stone Wall	Black, Homogeneous, Non-Fibrous	41.9	4.0	54.1	0%	100%	NAD Inconclusive	NAD
V43	BK0821370-43	Roof G - Caulking (White) on Foil Paper AHV Seams	White, Homogeneous, Non-Fibrous	60.3	11.3	28.5	0%	100%	NAD Inconclusive	NAD
V44	BK0821370-44	Roof G - Caulking (White) on Foil Paper AHV Seams	White, Homogeneous, Non-Fibrous	66.3	8.6	25.0	0%	100%	NAD Inconclusive	NAD
O45	BK0821370-45	Roof J - Perlite J - Perlite (Tan) Insulation under EPDM Roofing	Grey, Homogeneous, Friable	Not Applicable			30%CELL 20%Foam	50%	NAD	
O46	BK0821370-46	Air Handling Room (MS) - Spray-On Fireproofing on Beams	Grey, Homogeneous, Friable	Not Applicable			90%FBGL	10%	NAD	
W47	BK0821370-47	Air Handling Room (MS) - Spray-On Fireproofing on Beams	Grey, Homogeneous, Friable	Not Applicable			90%FBGL	10%	NAD	
W48	BK0821370-48	Air Handling Room (MS) - Spray-On Fireproofing on Beams	Grey, Homogeneous, Friable	Not Applicable			90%FBGL	10%	NAD	
X49	BK0821370-49	Music Room 90 - Yellow Adhesive Associated with Carpet Flooring	Yellow, Homogeneous, Non-Fibrous	78.2	10.1	11.6	0%	100%	NAD Inconclusive	NAD
X50	BK0821370-50	Music Room 90 - Yellow Adhesive Associated with Carpet Flooring	Yellow, Homogeneous, Non-Fibrous	55.6	18.0	26.4	0%	100%	NAD Inconclusive	NAD



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Bulk Asbestos Report by PLM-TEM

Client: WSP
Collected by: Client
Project Name/No.: Briarcliff Manor UFSD / 31403475.004
Project Address: Briarcliff Manor HSMS
Work Area: Roof

Lab ID: BK0821370
Date Received: 8/23/2021
PLM Date Analyzed: 8/24/2021
TEM Date Analyzed: 8/26/2021
Report Date: 8/26/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	AII%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
Y51	BK0821370-51	Auditorium (HS) - 12"x12" Black VFT	Black, Homogeneous, Non-Fibrous	22.8	9.3	67.9	0%	100%	NAD Inconclusive	Trace CHRY
Y52	BK0821370-52	Auditorium (HS) - 12"x12" Black VFT	Black, Homogeneous, Non-Fibrous	10.1	2.2	87.7	0%	100%	NAD Inconclusive	Trace CHRY
Z53	*BK0821370-53	Auditorium (HS) - Yellow Mastic associated with 12"x12" Black VFT	Yellow, Homogeneous, Non-Fibrous	71.2	18.4	10.4	0%	100%	NAD Inconclusive	NAD
Z54	*BK0821370-54	Auditorium (HS) - Yellow Mastic associated with 12"x12" Black VFT	Yellow, Homogeneous, Non-Fibrous	71.2	18.4	10.4	0%	100%	NAD Inconclusive	NAD
AA55	BK0821370-55	Auditorium (HS) - Yellow Mastic associated with Carpet Flooring	Yellow, Homogeneous, Non-Fibrous	49.5	9.3	41.2	0%	100%	NAD Inconclusive	NAD
AA56	BK0821370-56	Auditorium (HS) - Yellow Mastic associated with Carpet Flooring	Yellow, Homogeneous, Non-Fibrous	71.4	6.4	22.2	0%	100%	NAD Inconclusive	NAD
AB57	BK0821370-57	Library (MS) - Gypsum Board (White)	Beige/ Brown, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	NAD	
AB58	BK0821370-58	Art Room 121 (HS) - Gypsum Board (White)	Beige/ Brown, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	NAD	
AC59	BK0821370-59	Library (MS) - Joint Compound associate with Gypsum (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AC60	BK0821370-60	Art Room 121MS) - Joint Compound associate with Gypsum (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	



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Bulk Asbestos Report by PLM-TEM

Client: WSP
Collected by: Client
Project Name/No.: Briarcliff Manor UFSD / 31403475.004
Project Address: Briarcliff Manor HSMS
Work Area: Roof

Lab ID: BK0821370
Date Received: 8/23/2021
PLM Date Analyzed: 8/24/2021
TEM Date Analyzed: 8/26/2021
Report Date: 8/26/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	AII%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
AD61	BK0821370-61	Chorus Room 108 - 2'x4" Suspended Ceiling Tiles (White)	Grey, Homogeneous, Non-Fibrous	32.8	41.9	25.3	0%	100%	NAD Inconclusive	NAD
AD62	BK0821370-62	Maresca Center - 2'x4" Suspended Ceiling Tiles (White)	Grey, Homogeneous, Non-Fibrous	32.0	18.5	49.6	0%	100%	NAD Inconclusive	NAD
AE63	BK0821370-63	Chorus Room 108 - Gypsum Board (Whit)	Beige/ Brown, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	NAD	
AE64	BK0821370-64	Maresca Center - Gypsum Board (White)	Beige/ Brown, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	NAD	
AF65	BK0821370-65	Chorus Room 108 - Joint Compound (Tan) associated with Gypsum Board	Beige, Homogeneous, Friable	Not Applicable			0%	98.9%	1.1%CHRY	
AF66	BK0821370-66	Maresca Center - Joint Compound (Tan) associated with Gypsum Board	Beige, Homogeneous, Friable	Not Applicable					NA/PS	
AG67	BK0821370-67	Band Room 131 - Gypsum Board (Grey)	Grey, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	NAD	
AG68	BK0821370-68	Band Room 131 - Gypsum Board (Grey)	Grey, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	NAD	
AH69	BK0821370-69	Band Room 131 - Joint Compound associated with Gypsum board (Yellow)	White/ Beige, Homogeneous, Friable	Not Applicable			0%	~99%	Trace (<1%)CHRY	
AH70	BK0821370-70	Band Room 131 - Joint Compound associated with Gypsum board (Yellow)	White/ Beige, Homogeneous, Friable	Not Applicable			0%	~99%	Trace (<1%)CHRY	



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Bulk Asbestos Report by PLM-TEM

Client: WSP
Collected by: Client
Project Name/No.: Briarcliff Manor UFSD / 31403475.004
Project Address: Briarcliff Manor HSMS
Work Area: Roof

Lab ID: BK0821370
Date Received: 8/23/2021
PLM Date Analyzed: 8/24/2021
TEM Date Analyzed: 8/26/2021
Report Date: 8/26/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
AI71	BK0821370-71	Girls Toilet Ceiling / Roof Area Adj Toom 108 - Cementitious Material (White) at Roof Drain Bowl	Beige, Homogeneous, Friable	Not Applicable			20%FBGL	75.9%	4.1%CHRY	
AI72	BK0821370-72	Boys toilet Ceiling / Roof Area Adj Nurse - Cementitious Material (White) at Roof Drain Bowl	Beige, Homogeneous, Friable	Not Applicable					NA/PS	
AJ73	BK0821370-73	Art Room 121 - Mortar Associated with Cinderblock Walls	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AJ74	BK0821370-74	Art Room 121 - Mortar Associated with Cinderblock Walls	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AK7	BK0821370-75	Exterior - Adj M.S Cafeteria - Sidewalk / Brick Expansion Joint Caulking (Grey)	Grey, Homogeneous, Non-Fibrous	45.7	1.7	52.6	0%	100%	NAD Inconclusive	NAD
AK76	BK0821370-76	Exterior - Adj M.S Cafeteria - Sidewalk / Brick Expansion Joint Caulking (Grey)	Grey, Homogeneous, Non-Fibrous	49.8	5.7	44.5	0%	100%	NAD Inconclusive	NAD
AL77	BK0821370-77	Stair by Room 110 - Mortar associated with Terrazzo Floor	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	



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Bulk Asbestos Report by PLM-TEM

Client: WSP
Collected by: Client
Project Name/No.: Briarcliff Manor UFSD / 31403475.004
Project Address: Briarcliff Manor HSMS
Work Area: Roof

Lab ID: BK0821370
Date Received: 8/23/2021
PLM Date Analyzed: 8/24/2021
TEM Date Analyzed: 8/26/2021
Report Date: 8/26/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
AL78	BK0821370-78	Stair by Room 115 - Mortar associated with Terrazzo Floor	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	

*Samples #53-54 analyzed as combined

TC

Quantitative Analysis (Semi/Full): Bulk Asbestos Analysis-PLM by EPA 600/M4-82-020 per 40 CFR or ELAP 198.1 (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=Anthophyllite, 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%, All= Acid Insoluble Inorganic%, ASI= Acid Soluble Inorganic%

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NYS-ELAP#11999, NVLAP Lab Code: 500092-0, NJ ID: NY034, CT Reg. ID: PH-0154

PLM Analyst: AS

TEM Analyst: VR

Approved by:

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 1 OF 7

PROJECT NO.: 31403475.004
 CLIENT: Briarcliff Manor UFSD
 PROJECT SITE: Briarcliff Manor HSMS
 Project Manager: A. Smolyar

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

LOCATION(S) SURVEYED: Roof
 PROPOSED PROJECT: Reconstruction
 DATE(S) OF INSPECTION: 8/10/2021
 Inspector(s): Stephen Gruber, Nicholas Colonna

BK0821370

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
A	01	Roof ^{SE} Exterior - North	Brick Mortar (Grey)		Roof Level
↓	02	↓ - South	↓		↓
B	03	↓ - North	Brick Mortar (Pink)		
↓	04	↓ - South	↓		
C	05	Exterior - NE	Stone Mortar (Grey)		↓
↓	06	↓ - NW	↓		↓
D	07	Roof B	Tar (Black) on Foil paper		
↓	08	Roof G	on Air Handling Units		
E	09	↓	[Caulking (Grey) on]		
↓	10	↓	[Skylight Panel]		
F	11	Roof A	Caulking (Beige) on AHU		
↓	12	↓	↓		

CHAIN OF CUSTODY

Relinquished by: (print) <u>STEPHEN GRUBER</u>	(Sign) <u>[Signature]</u>	<u>8/23/21 6:56</u>	Relinquished by: (print)	(Sign)	/ /	AMPM	Relinquished by: (print)	(Sign)	/ /	AMPM
Received by: (print) <u>Anita Liu</u>	(Sign) <u>[Signature]</u>	<u>8/23/21 18:40</u>	Received by: (print)	(Sign)	/ /	AMPM	Received by: (print)	(Sign)	/ /	AMPM

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

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 2 OF 4

PROJECT NO.: 31403475.004

CLIENT: Briarcliff Manor UFSD

PROJECT SITE: Briarcliff Manor HSMS

Project Manager: A. Smolyar

LOUIS BERGER

TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341

ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014

LOCATION(S) SURVEYED: Roof

PROPOSED PROJECT: Renovation

DATE(S) OF INSPECTION: 8/10/2021

Inspector(s): Stephen Gruber, Nicholas Colonna

BK021370

RESULTS TO: Lb.Labresults@wsp.com

Alexandere 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
G	13	Roof H	[Pitch Pochet Sealant]		
↓	14	Roof G	(Grey)		
H	15	Roof # E	[Pitch Pochet Sealant]		
↓	16	Roof # F	(White)		
I	17	Roof H	[Vent Pipe Sealant Caulking]		
↓	18	Roof J	Sealant (Grey)		
J	19	Roof K	Caulking (Black) at		
↓	20	Roof G	Metal Facade Panels		
K	21	↓	Caulking (white) at		
↓	22	↓	metal Cap Flashing		
L	23	Roof K	Expansion Joint caulking		
↓	24	↓	(Grey) on wall		

CHAIN OF CUSTODY

Relinquished by: (print) STEPHEN GRUBER	(Sign)	8/23/21 6:50 AM	Relinquished by: (print)	(Sign)	/ /	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM
Received by: (print) Anita Lora	(Sign)	8/23/21 18:40 AM	Received by: (print)	(Sign)	/ /	AM/PM	Received by: (print)	(Sign)	/ /	AM/PM

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

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 3 OF 7

PROJECT NO.: 314034750004
CLIENT: Briarcliff Manor UFSD
PROJECT SITE: Briarcliff Manor HSMS
Project Manager: A. Smolyar

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

LOCATION(S) SURVEYED: Root
PROPOSED PROJECT: Reconstruction
DATE(S) OF INSPECTION: 8/10/2021
Inspector(s): STEPHEN GRUBER, NICHOLAS COLONNI

BK0821370

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
M	25	Roof A	Gypsum (white) Root Deck		
↓	26	↓	Material		
N	27	↓	[Fiberboard (Brown) under		
↓	28	Roof B	EPDM Roofing]		
O	29	Roof J	[Perlite (Tan) Insulation		
↓	30	Roof F	Under EPDM Roofing]		
P	31	Roof K	[Fibrous Insulation (Brown)		
↓	32	Roof H	Under EPDM Roofing]		
Q	33	Roof G	Felt Paper (Black) under		
↓	34	↓	EPDM Roofing		
R	35	Roof C	Sealant (white) on Square		
↓	36	↓	Exhausts		

CHAIN OF CUSTODY

Relinquished by: (print) STEPHEN GRUBER	(Sign)	8/13/21	615	AM/PM	Relinquished by: (print)	(Sign)	/	/	AM/PM
Received by: (print) Antelav	(Sign) Ah	8/03/21	18:40	AM/PM	Received by: (print)	(Sign)	/	/	AM/PM

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

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 4 OF 9

PROJECT NO.: 314034750 004

CLIENT: Briarcliff Manor UFSD

PROJECT SITE: Briarcliff Manor HSMS

Project Manager: A. Smolyar

LOUIS BERGER

TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341

ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014

LOCATION(S) SURVEYED: Roof

PROPOSED PROJECT: Reconstruction

DATE(S) OF INSPECTION: 8/10/2021

Inspector(s): STEPHEN GRUBER, NICHOLAS COLONNI

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
5	37	Roof G	Tar (Black) at base of		wooden substrate
↓	38	↓	AHV kerb		
T	39	↓	Caulking (Black) at square		
↓	40	↓	Skylight panels		
U	41	Roof B (North side)	Caulking (Black) at		
↓	42	↓	Metal cap/store wall		
V	43	Roof G	[Caulking (white) on		
↓	44	↓	on Foil Paper AHV Seams		
O	45	Roof J	Perlite (tan) insulation under EPDM roofing		

CHAIN OF CUSTODY

Relinquished by: (print) STEPHEN GRUBER	(Sign)	8/12/21 6:50 AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM
Received by: (print) Natalia	(Sign)	8/23/21 18:40 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



ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 5 OF 7

PROJECT NO.: 314034750 004
CLIENT: Briarcliff Manor UFSD
PROJECT SITE: Briarcliff Manor HS/MS
Project Manager: A. Smolyar

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

LOCATION(S) SURVEYED: Various locations
PROPOSED PROJECT: Reconstruction
DATE(S) OF INSPECTION: 8/13/2021
Inspector(s): STEPHEN GRUBER

BK0821370

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
W	46	Air Handling Room (MS)	Spray-on Fireproofing		
↓	47	↓	On Beams		
↓	48	↓	↓		
X	49	MUSIC Room 90	Yellow adhesive assoc		
↓	50	↓	w carpet flooring		
Y	51	Auditorium (HS)	Black 12"x12"		
↓	52	↓	Black VFT		
Z	53	↓	[Yellow mastic assoc w]		
↓	54	↓	[12"x12" Black VFT]		
AA	55	↓	Yellow adhesive assoc		
↓	56	↓	w carpet flooring		
AB	57	Library (MS)	Gypsum Board (white)		

CHAIN OF CUSTODY

Relinquished by: (print) <u>STEPHEN GRUBER</u>	(Sign) <u>[Signature]</u>	8/23/21 6:50 AM/PM	Relinquished by: (print) _____	(Sign) _____	/ /	AM/PM	Relinquished by: (print) _____	(Sign) _____	/ /	AM/PM
Received by: (print) <u>A. Smolyar</u>	(Sign) <u>[Signature]</u>	8/23/21 12:40 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



ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 6 OF 7

PROJECT NO.: 314034750004

CLIENT: Briarcliff Manor UFSD

PROJECT SITE: Briarcliff Manor HSMS

Project Manager: A. Smolyar

LOUIS BERGER

TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341

ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014

LOCATION(S) SURVEYED: Various Locations

PROPOSED PROJECT: Reconstruction

DATE(S) OF INSPECTION: 8/13/2021

Inspector(s): STEPHEN GRUBER

BK0821370

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
↓	58	Art Room 121 (HS)	Gypsum Board (white)		
AC	59	Library (MS)	Joint compound assoc w		
↓	60	Art Room 121 (HS)	Gypsum (white)		
AD	61	Chorus Room 108	2'x4" suspended		
↓	62	Maresca Center	Ceiling Tiles (white)		
AE	63	Chorus Room 108	Gypsum Board (white)		
↓	64	Maresca Center	↓		
AF	65	Chorus Room 108	Joint compound (tan)		
↓	66	Maresca Center	assoc. w Gypsum Board		

CHAIN OF CUSTODY

Relinquished by: (print) J. Wang	(Sign)	8/23/21 6:15 AM	Relinquished by: (print) J. Wang	(Sign)	8/23/21 6:15 AM	Relinquished by: (print) J. Wang	(Sign)	8/23/21 6:15 AM
Received by: (print) A. Smolyar	(Sign)	8/23/21 12:40 AM	Received by: (print) A. Smolyar	(Sign)	8/23/21 12:40 AM	Received by: (print) A. Smolyar	(Sign)	8/23/21 12:40 AM

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



ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 1 OF 7

PROJECT NO.: 31403475.004
CLIENT: Briarcliff Manor UFSD
PROJECT SITE: Briarcliff Manor HSMS
Project Manager: A. Smolyar

LOCATION(S) SURVEYED: Various Locations
PROPOSED PROJECT: Reconstruction
DATE(S) OF INSPECTION: 8/18/2021
Inspector(s): Stephen Gruber

LOUIS BERGER
 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
AG	67	Band Room 131	Gypsum Board (Grey)		
↓	68		↓		
AH	69		[Joint compound assoc		
↓	70		w Gypsum Board (Yellow)]		
AI	71	Girls Toilet Ceiling / Roof Area adj Room 100	[Cementitious material (white)		
↓	72	Boys Toilet Ceiling / Roof Area adj Nurse	[at Roof Drain Bowl]		
AJ	73	Art Room 121	Mortar assoc w		
↓	74	↓	Cinder block walls		
AK	75	Exterior - Adj MoS Cafeteria	[Sidewalk / Brick Expansion]		
↓	76	↓	[Joint caulking (grey) on grout]		
AL	77	Stairs by Rm 110	Mortar assoc w		
↓	78	Stairs by Rm 115	Terrazzo Floor		

CHAIN OF CUSTODY

Relinquished by: (print) <u>STEPHEN GRUBER</u> (Sign)	8/23/21 6:50 AM/PM	Relinquished by: (print) _____ (Sign) _____	_____	AM/PM	Relinquished by: (print) _____ (Sign) _____	_____	AM/PM
Received by: (print) <u>Antulaw</u> (Sign)	8/23/21 18:40 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



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
Collected by: Client
Project Name/No.: Briarcliff CSD / 31403475.004
Project Address: 444 Pleasantville Rd., Briarcliff Manor, NY 10510
Work Area:

Lab ID: BK0821466
Date Received: 8/30/2021
PLM Date Analyzed: 8/31/2021
TEM Date Analyzed: 8/31/2021
Report Date: 9/1/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
AM07	BK0821466-1	Fuel Tank/Elec. Enclosure - Outside Wall / White Expansion Joint Caulking	Grey, Homogeneous, Non-Fibrous	8.9	12.4	78.7	0%	100%	NAD Inconclusive	NAD
AM80	BK0821466-2	Fuel Tank/Elec. Enclosure - Outside Wall / White Expansion Joint Caulking	Grey, Homogeneous, Non-Fibrous	12.0	12.0	76.0	0%	100%	NAD Inconclusive	NAD
AN81	BK0821466-3	M.S Gym - Mortar (Gray) associated with Block Wall	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AN82	BK0821466-4	Room 96 - Mortar (Gray) associated with Block Wall	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AO83	BK0821466-5	Prep Room Adj Room 101- Black Mastic Associated with 12"x12" VFT	Black, Homogeneous, Non-Fibrous	13.0	46.6	40.4	0%	100%	NAD Inconclusive	NAD
AO84	BK0821466-6	Prep Room Adj Room 101- Black Mastic Associated with 12"x12" VFT	Black, Homogeneous, Non-Fibrous	12.0	15.6	72.4	0%	100%	NAD Inconclusive	NAD
AP85	BK0821466-7	Prep Room Adj Room 101- 12"x12" Speckled Brown VFT	Tan, Homogeneous, Non-Fibrous	8.3	22.4	69.3	0%	100%	NAD Inconclusive	NAD
AP86	BK0821466-8	Prep Room Adj Room 101- 12"x12" Speckled Brown VFT	Tan, Homogeneous, Non-Fibrous	3.8	33.4	62.8	0%	100%	NAD Inconclusive	NAD
AQ87	BK0821466-9	Exterior Adj Room Art Room 134 - Door Frame Caulking (Grey) and Expansion Joint Caulking (Gray)	Brown, Homogeneous, Non-Fibrous	9.1	27.1	63.8	0%	100%	NAD Inconclusive	NAD
AQ88	BK0821466-10	Exterior Adj Room Art Room 134 - Door Frame Caulking (Grey) and Expansion Joint Caulking (Gray)	Brown, Homogeneous, Non-Fibrous	9.4	26.6	64.0	0%	100%	NAD Inconclusive	NAD



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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
Collected by: Client
Project Name/No.: Briarcliff CSD / 31403475.004
Project Address: 444 Pleasantville Rd., Briarcliff Manor, NY 10510
Work Area:

Lab ID: BK0821466
Date Received: 8/30/2021
PLM Date Analyzed: 8/31/2021
TEM Date Analyzed: 8/31/2021
Report Date: 9/1/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
AR89	BK0821466-11	Roof G- Felt Paper (White) Associated with Insulation	Grey, Homogeneous, Non-Fibrous	10.1	6.0	83.9	0%	100%	NAD Inconclusive	NAD
AR90	BK0821466-12	Roof G- Felt Paper (White) Associated with Insulation	Grey, Homogeneous, Non-Fibrous	11.2	6.9	81.9	0%	100%	NAD Inconclusive	NAD

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=Anthophyllite, 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%, All= 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, CT Reg. ID: PH-0154

PLM Analyst: AS

TEM Analyst: VR

Approved by:



ASBESTOS SURVEY DATA SHEET / CHAIN OF CUSTODY

PAGE 1 OF 1

PROJECT NO.: 31403475.004

CLIENT: Briarcliff CSD CAPIS ID#: #

PROJECT SITE: Briarcliff High School / Middle School

PROJECT ADDRESS: 444 Pleasantville Rd. Briarcliff

LOUIS BERGER dba WSP USA Solutions, Inc.

TELEPHONE NO.: (212) 612-7900

ADDRESS: 96 Morton Street 8th Floor, New York, NY 10014

DATE(S) OF INSPECTION: 8.26.2021

Project Manager: A. Smolyar

Inspector(s)/Investigator(s): STEPHEN GRUBER, NICHOLAS CASALE

Alexander.smolyar@wsp.com

RESULTS TO: joel.garcia@wsp.com

prakash.saha@wsp.com

TURNAROUND TIME:

☐ 12 HR. ☐ 24 HR. ☒ 48 HR. ☐ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	Conditions Good/Fair/Poor	Friable Yes/No	FIELD NOTES
1 AM	79	Fuel Tank/Elec Enclosure	White Expansion Joint				vertical
2 ↓	80	- Outside Wall	Caulking				
3 AN	81	[M.S Gym]	[Mortar (gray) assoc]				
4 ↓	82	[Room 96]	[w Block wall]				
5 AO	83	Prep Rm adj Rm 101	[Black mastic assoc]				
6 ↓	84		[w 12"X12" VFT]				
7 AP	85		[12"X12" Speckled]				
8 ↓	86		Brown VFT				
9 AQ	87	Exterior Adj Rm Att Rm	Door Frame Caulking (Gray)				
10 ↓	88	↓ 134 ↓	Expansion Joint Caulking (Gray)				
11 AR	89	Roof G	[Felt paper (white)]				
12 ↓	90		[assoc w Foam Insulation]				

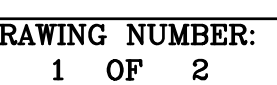
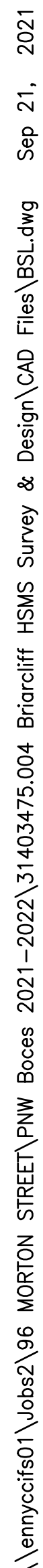
CHAIN OF CUSTODY

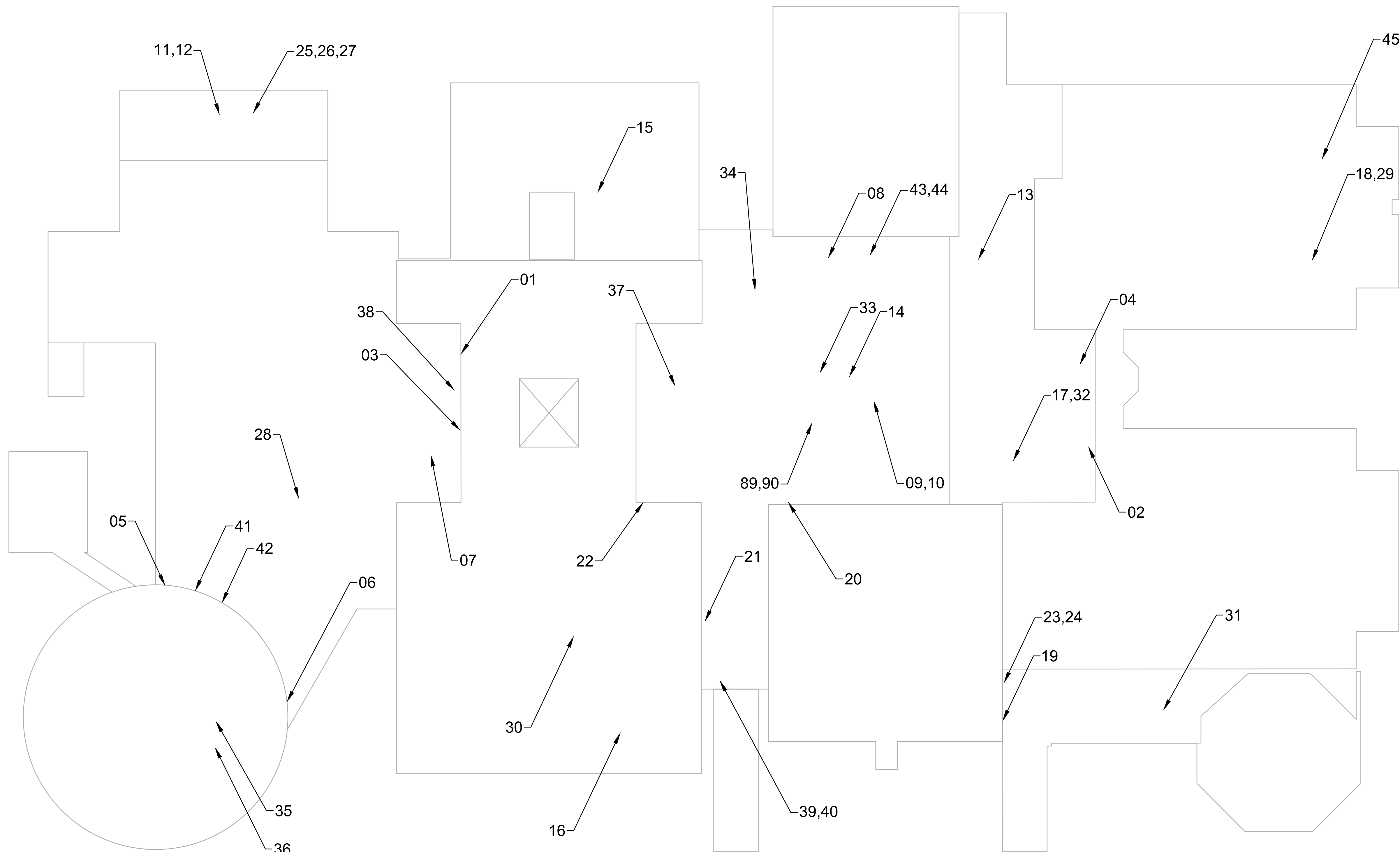
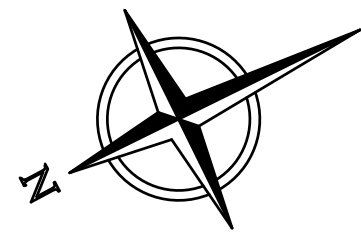
Relinquished by: (print) STEPHEN GRUBER	(Sign)	8/30/2021	8:40 AM	Relinquished by: (print)	(Sign)	/ /	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM
Received by: (print) Nicholas Casale	(Sign)	8/30/21	7:40 AM	Received by: (print)	(Sign)	/ /	AM/PM	Received by: (print)	(Sign)	/ /	AM/PM

General Notes: All inconclusive NOBs to be analyzed by TEM. Please stop at 1st positive in any homogeneous group.



**APPENDIX C:
ASBESTOS BULK SAMPLE LOCATION DRAWINGS**





1 BULK SAMPLE LOCATION PLAN - ROOF
SCALE: NOT TO SCALE



**BRIARCLIFF MANOR UNION
FREE SCHOOL DISTRICT**

**45 INGHAM ROAD
BRIARCLIFF MANOR, NY
10510**

LOCATION PLAN
NTS



ENVIRONMENTAL CONSULTANT



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

**BRIARCLIFF HIGH SCHOOL/MIDDLE
SCHOOL
444 PLEASANTVILLE RD,
BRIARCLIFF MANOR, NY 10510**

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

**CONSULTANT SERVICES FOR
PHASE 1, 2 & 3 PROJECT
SURVEY & DESIGN SERVICE**

**BRIARCLIFF HIGH SCHOOL/MIDDLE
SCHOOL**

DRAWING TITLE:

**BULK SAMPLE LOCATION PLAN
ROOF**

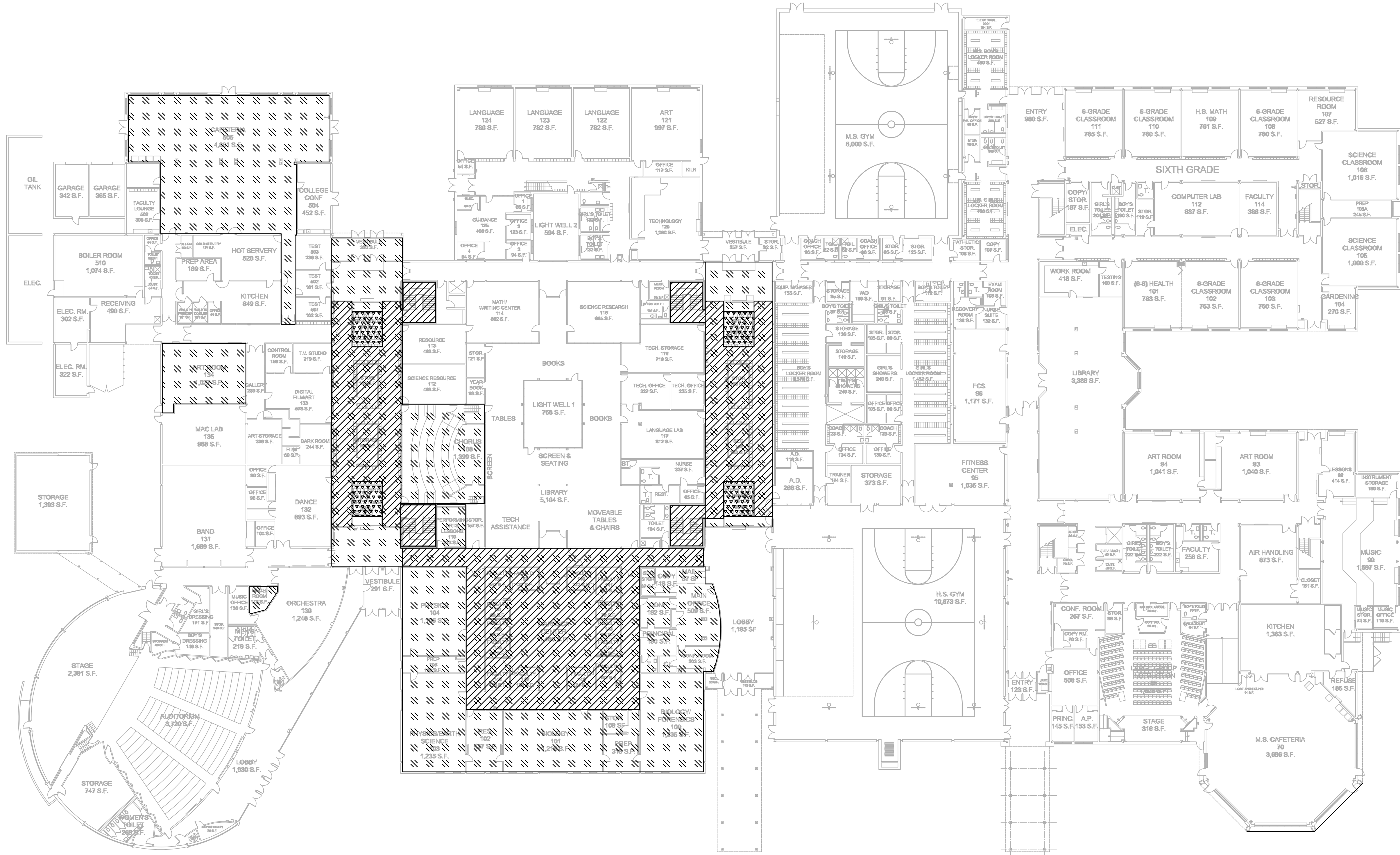
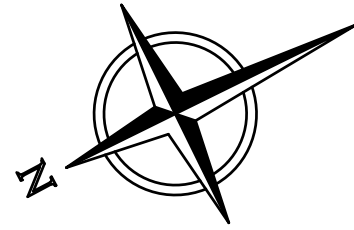
DRAWN BY:	J. LIU	SCALE:	NOT TO SCALE
INSP/INV.	S. GRUBER	DATE:	09/10/2021
CERTIFICATE NO.	17-42557	DRAWING NUMBER:	
CHECKED BY:	A. SMOLYAR		

BSL002

DRAWING NUMBER:
2 OF 2



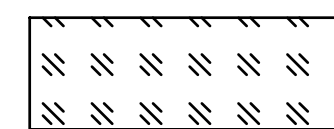
**APPENDIX D:
ASBESTOS CONTAINING MATERIALS LOCATION
DRAWINGS**



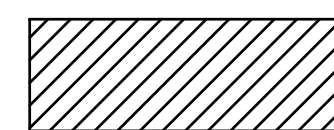
1 ACM LOCATION PLAN - FIRST FLOOR
SCALE: NOT TO SCALE

NOTES:
EXACT LOCATIONS OF IMPACTED ACM MATERIALS TO BE DETERMINED
BY CONTRACTOR IN THE FIELD (I.E. BELL/STROBE UNITS)

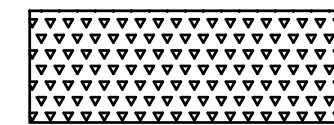
LEGEND:



APPROXIMATE LOCATION OF ASBESTOS CONTAINING JOINT
COMPOUND (TAN) ASSOCIATED WITH GYPSUM BOARD



APPROXIMATE LOCATION OF ASBESTOS CONTAINING 12"X12" FLOOR
TILE & ASSOCIATED MASTIC



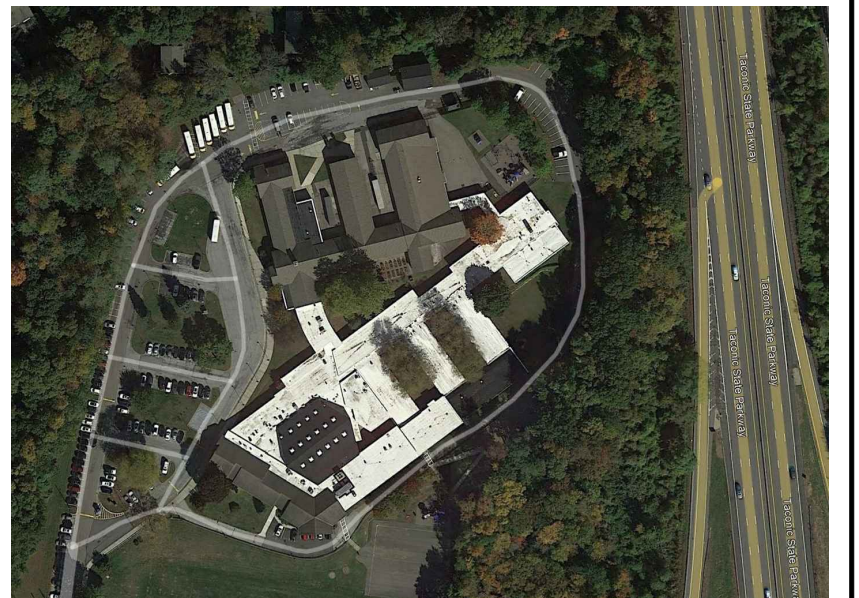
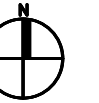
APPROXIMATE LOCATION OF ASBESTOS CONTAINING CEMENTITIOUS
MATERIAL (WHITE) AT ROOF DRAIN BOWL AND PIPE ELBOW



BRIARCLIFF MANOR UNION
FREE SCHOOL DISTRICT

45 INGHAM ROAD
BRIARCLIFF MANOR, NY
10510

LOCATION PLAN
NTS



ENVIRONMENTAL CONSULTANT



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

BRIARCLIFF HIGH SCHOOL/MIDDLE
SCHOOL
444 PLEASANTVILLE RD,
BRIARCLIFF MANOR, NY 10510

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

CONSULTANT SERVICES FOR
PHASE 1, 2 & 3 PROJECT
SURVEY & DESIGN SERVICE

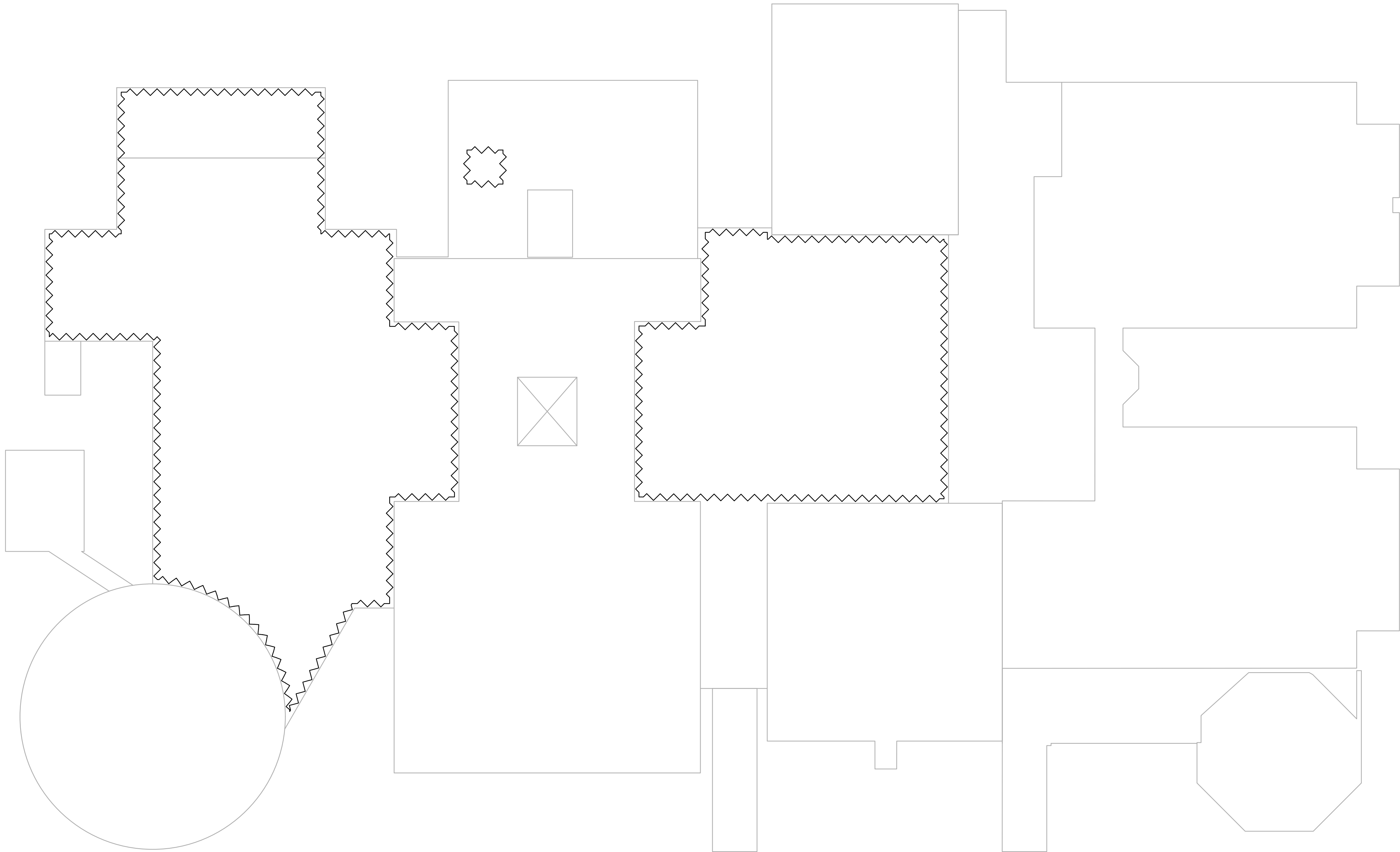
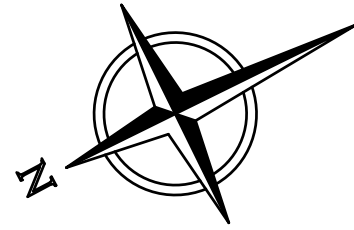
BRIARCLIFF HIGH SCHOOL/MIDDLE
SCHOOL

DRAWING TITLE:
ACM LOCATION PLAN
FIRST FLOOR

DRAWN BY:	J. LIU	SCALE: NOT TO SCALE
INSP/INV.	S. GRUBER	DATE: 09/10/2021
CERTIFICATE NO.	17-42557	DRAWING NUMBER:
CHECKED BY:	A. SMOLYAR	

ACM001

DRAWING NUMBER:
1 OF 2



1

ACM LOCATION PLAN - ROOF

SCALE: NOT TO SCALE

LEGEND:



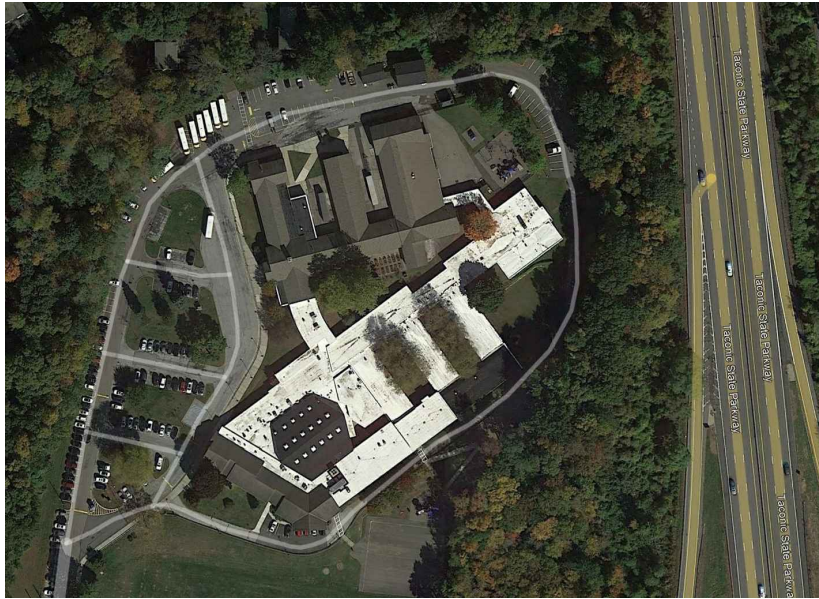
APPROXIMATE LOCATIONS OF ASBESTOS CONTAINING TAR OF AHU CURB (UNDER EPDM ROOFING)



**BRIARCLIFF MANOR UNION
FREE SCHOOL DISTRICT**

**45 INGHAM ROAD
BRIARCLIFF MANOR, NY
10510**

LOCATION PLAN
NTS



ENVIRONMENTAL CONSULTANT



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

**BRIARCLIFF HIGH SCHOOL/MIDDLE
SCHOOL
444 PLEASANTVILLE RD,
BRIARCLIFF MANOR, NY 10510**

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

**CONSULTANT SERVICES FOR
PHASE 1, 2 & 3 PROJECT
SURVEY & DESIGN SERVICE**

**BRIARCLIFF HIGH SCHOOL/MIDDLE
SCHOOL**

DRAWING TITLE:

**ACM LOCATION PLAN
ROOF**

DRAWN BY:	J. LIU	SCALE: NOT TO SCALE
INSP/INV.	S. GRUBER	DATE: 09/10/2021
CERTIFICATE NO.	17-42557	DRAWING NUMBER:
CHECKED BY:	A. SMOLYAR	

ACM002

DRAWING NUMBER:
2 OF 2



**APPENDIX E:
LEAD XRF SHOT RESULTS**

		XRF CALIBRATION CHECK FORM			PAGE <u>1</u> OF <u>4</u>	
PROJ. NO.: <u>31403475.004</u>		DATE: <u>8/26/21</u>				
PROJECT NAME: <u>Reconstruction</u>		INSPECTOR NAME: <u>N. Casale & S. Gruber</u>				
CLIENT: <u>Briarcliff SD</u>		INSPECTOR SIGNATURE: <u>N. Casale</u>				
SITE: <u>Briarcliff MS/HS</u>		PROJ. MANAGER: <u>A. Smolyar</u>				
WSP USA Solutions Inc. TELEPHONE #: (212) 612-7900 FAX #: (212) 425-1818 ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014		XRF MAKE/MODEL: <u>RMD LPA-1 (Serial#3675)</u> <u>Heuresis Pb200i (Serial#2150)</u>		LLW#: _____		
		JOB#: <u>08261446</u>				
NOTES: _____						
CALIBRATION CHECK – PRIOR TO LEAVING OFFICE <u>Start</u>						
<u>1.0</u> mg/cm ² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE	
CALIBRATION TIME: <u>11:19 AM</u>	TEST #	<u>1</u>	<u>2</u>	<u>3</u>	<u>1.1</u>	
	XRF READING	<u>1.1</u>	<u>1.1</u>	<u>1.1</u>		
CALIBRATION CHECK – PRIOR TO LEAVING OFFICE <u>Start</u>						
<u>0.0</u> mg/cm ² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE	
CALIBRATION TIME: <u>11:22 AM</u>	TEST #	<u>4</u>	<u>5</u>	<u>6</u>	<u>0.0</u>	
	XRF READING	<u>0.0</u>	<u>0.0</u>	<u>-0.1</u>		
CALIBRATION CHECK – FIELD START						
_____ mg/cm ² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE	
CALIBRATION TIME: <u>4:54 pm</u>	TEST #	<u>61</u>	<u>62</u>	<u>63</u>	<u>1.1</u>	
	XRF READING	<u>1.1</u>	<u>1.1</u>	<u>1.1</u>		
CALIBRATION CHECK – FIELD-END/2-HR (circle one)						
_____ mg/cm ² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE	
CALIBRATION TIME: <u>2:56 pm</u>	TEST #	<u>64</u>	<u>65</u>	<u>66</u>	<u>0.0</u>	
	XRF READING	<u>0.0</u>	<u>0.1</u>	<u>0.0</u>		
CALIBRATION CHECK – FIELD-END/2-HR (circle one)						
_____ mg/cm ² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE	
CALIBRATION TIME: _____	TEST #					
	XRF READING					
CALIBRATION CHECK – FIELD-END/2-HR (circle one)						
_____ mg/cm ² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE	
CALIBRATION TIME: _____	TEST #					
	XRF READING					
CALIBRATION CHECK – FIELD-END/2-HR (circle one)						
_____ mg/cm ² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE	
CALIBRATION TIME: _____	TEST #					
	XRF READING					

PROJECT NO.: 31403475.004

PROJECT NAME: Reconstruction

LPA1 - #3675
PB2001 - #2150

CLIENT: Briardiff CSD

PROJECT LOCATION: Briardiff HS MS

INSPECTOR(S): N. Cusack & S. Guber

INSPECTION DATE: 8.26.2021

PROJ. MANAGER: A. Smolyar

SPACE CHARACTERISTICS:

NOTES:

FLOOR #: _____ ROOM #: _____ ROOM NAME: _____

LLW#: _____ JOB#: _____

SAMPLE #	SUBSTRATE	COMPONENT DESCRIPTION										XRF READING (mg/cm²)
		COLOR	CONDITION (I/F/P)	COMPONENT	WALL/SIDE DESIGN.	SIDE (L/C/R)	HEIGHT (L/M/U)	COMPONENT TRIPLICATE	QUANTITY (IF POSITIVE) (SF)	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	
7	M PL S C CB PG CR B W V CT G FG OTHER:	Red		Door	A B C D RM CTR FL CL				1 FI		HS Cafeteria	0.0
8	M PL S C CB PG CR B W V CT G FG OTHER:	↓		Door Frame	A B C D RM CTR FL CL				↓			0.2
9	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
10	M PL S C CB PG CR B W V CT G FG OTHER:	↓		↓	A B C D RM CTR FL CL				↓			0.2
11	M PL S C CB PG CR B W V CT G FG OTHER:	Red		Window Frame	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:	White		Wall	A B C D RM CTR FL CL				1 FI		Boiler Room	0.1
13	M PL S C CB PG CR B W V CT G FG OTHER:	Blue		cylindrical boiler	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:	Gray		Boiler Footing	A B C D RM CTR FL CL				↓			0.1
15	M PL S C CB PG CR B W V CT G FG OTHER:	Yellow Red		Boiler Frame	A B C D RM CTR FL CL				↓		Rm 134	0.1
16	M PL S C CB PG CR B W V CT G FG OTHER:	Red		Door	A B C D RM CTR FL CL				↓			0.0
17	M PL S C CB PG CR B W V CT G FG OTHER:	Black		Cave huge	A B C D RM CTR FL CL				↓		Lockers by 132	0.2
18	M PL S C CB PG CR B W V CT G FG OTHER:	Blue		Lockers	A B C D RM CTR FL CL				↓		Lockers by 133	0.1
19	M PL S C CB PG CR B W V CT G FG OTHER:	Blue		Bathroom partition	A B C D RM CTR FL CL				↓		Go to 1 by 132	0.0
20	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
21	M PL S C CB PG CR B W V CT G FG OTHER:	Light Blue		Radiators	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:	Yellow		Vertical beam	A B C D RM CTR FL CL				↓		Rm 131	0.5
23	M PL S C CB PG CR B W V CT G FG OTHER:	Black		Door Frame	A B C D RM CTR FL CL				↓			0.3
24	M PL S C CB PG CR B W V CT G FG OTHER:	Yellow		Wall	A B C D RM CTR FL CL				↓			0.2
25	M PL S C CB PG CR B W V CT G FG OTHER:	Black		Seats	A B C D RM CTR FL CL				↓		Auditorium	0.2
26	M PL S C CB PG CR B W V CT G FG OTHER:	↓		Bench	A B C D RM CTR FL CL				↓			0.0

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; OTHER: Other; Condition: I = Intact; F = Fair; P = Poor; Initial Result: P = Positive; N = Negative;

G = Gypsum

PROJECT NO.: 31403475.004

PROJECT NAME: Reconstruction

LPA1 - #3675
PB2001 - #2150

CLIENT: Brainerd CSD

PROJECT LOCATION: Brainerd HSM

INSPECTOR(S): No Casale & S. G. G. G.

INSPECTION DATE: 8-26-2021

PROJ. MANAGER: A. SMOLEYAN

SPACE CHARACTERISTICS:

NOTES:

FLOOR #: ROOM #: ROOM NAME:

LLW#: JOB#:

SAMPLE #	SUBSTRATE	COMPONENT DESCRIPTION										XRF READING (mg/cm ²)
		COLOR	CONDITION (I/F/P)	COMPONENT	WALL/SIDE DESIGN.	SIDE (L/C/R)	HEIGHT (L/M/U)	COMPONENT TREPICANT	QUANTITY (IF POSITIVE) [SF]	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	
27	M PL S C CB PG CR B W V CT G FG OTHER:	White		Railing	A B C D RM CTR FL CL				4 Floor		Stairs near 110	0.4
28	M PL S C CB PG CR B W V CT G FG OTHER:	↓		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:	Berg Gold		Conduit	A B C D RM CTR FL CL				↓			0.7
30	M PL S C CB PG CR B W V CT G FG OTHER:	Red		Sill	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:	Yellow		Wall	A B C D RM CTR FL CL				↓		Hall near 110	0.1
32	M PL S C CB PG CR B W V CT G FG OTHER:	White		Ceiling	A B C D RM CTR FL CL				↓		Chorus Rm	0.2
33	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
34	M PL S C CB PG CR B W V CT G FG OTHER:	Red		Handrail	A B C D RM CTR FL CL				↓			0.0
35	M PL S C CB PG CR B W V CT G FG OTHER:	Red		Beam	A B C D RM CTR FL CL				↓		Maresca Center	0.5
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				↓			0.1
37	M PL S C CB PG CR B W V CT G FG OTHER:	Blue		Wall	A B C D RM CTR FL CL				↓		Rm 110	0.2
38	M PL S C CB PG CR B W V CT G FG OTHER:	Red		Base Molding	A B C D RM CTR FL CL				↓		Corridor by 110	0.2
39	M PL S C CB PG CR B W V CT G FG OTHER:	Purple		Door Frame	A B C D RM CTR FL CL				↓		Rm 100	0.0
40	M PL S C CB PG CR B W V CT G FG OTHER:	Purple		Wall	A B C D RM CTR FL CL				↓			1.2
41	M PL S C CB PG CR B W V CT G FG OTHER:	Purple		Vertical Beam	A B C D RM CTR FL CL				↓			0.5
42	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				↓		Rm 100	0.1
43	M PL S C CB PG CR B W V CT G FG OTHER:	Purple		Wall	A B C D RM CTR FL CL				↓		Rm 102	0.1
44	M PL S C CB PG CR B W V CT G FG OTHER:	Blue		Wall	A B C D RM CTR FL CL				↓		Rm 121	0.0
45	M PL S C CB PG CR B W V CT G FG OTHER:	Teal		Wall	A B C D RM CTR FL CL				↓		Rm 96	0.2
46	M PL S C CB PG CR B W V CT G FG OTHER:	Blue		Wall	A B C D RM CTR FL CL				↓		MS Cafeteria	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: Gypsum; Condition: I = Intact; F = Fair; P = Poor; Initial Result: P = Positive; N = Negative;

G = Gypsum



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

PAGE 4 OF 4PROJECT NO.: 31403475.004PROJECT NAME: ReconstructionLPA1 - #3675
PB200i - #2150CLIENT: Brardiff CSDPROJECT LOCATION: Brardiff HS MSINSPECTOR(S): STEPHEN GRUBER / N. CasalePROJ. MANAGER: A. S. MOLYNDINSPECTION DATE: 8.26.2024

SPACE CHARACTERISTICS:

FLOOR #: _____ ROOM #: _____ ROOM NAME: _____

NOTES:

LLW#: _____ JOB#: _____

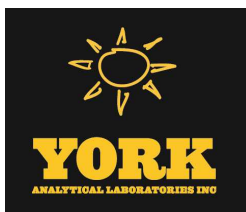
SAMPLE #	SUBSTRATE	COMPONENT DESCRIPTION										XRF READING (mg/cm ²)
		COLOR	CONDITION (I/F/P)	COMPONENT	WALL/SIDE DESIGN.	SIDE (L/C/R)	HEIGHT (L/M/U)	COMPONENT TREPPLICANT	QUANTITY (IF POSITIVE) (SF)	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	
47	M PL S C CB PG CR B W V CT G FG OTHER:	White		Radiator	A B C D RM CTR FL CL				1 Flr		Rm 90	0.2
48	M PL S C CB PG CR B W V CT G FG OTHER:	Yellow		Wall	A B C D RM CTR FL CL				2 Flr		Rm 210	0.1
49	M PL S C CB PG CR B W V CT G FG OTHER:	Gray		Wall	A B C D RM CTR FL CL				↓		Hallway by Elec	0.0
50	M PL S C CB PG CR B W V CT G FG OTHER:	Black		Wall	A B C D RM CTR FL CL				1 Flr		MS Gym	-0.3
51	M PL S C CB PG CR B W V CT G FG OTHER:	Yellow		Wall	A B C D RM CTR FL CL				↓		Hall by MS Gym	-0.1
52	M PL S C CB PG CR B W V CT G FG OTHER:	↓		Wall	A B C D RM CTR FL CL				↓		Hall by HS Gym	0.1
53	M PL S C CB PG CR B W V CT G FG OTHER:	White		Ceiling	A B C D RM CTR FL CL				↓		Lochies by 113	0.1
54	M PL S C CB PG CR B W V CT G FG OTHER:	Red		Network	A B C D RM CTR FL CL				↓		↓	0.6
55	M PL S C CB PG CR B W V CT G FG OTHER:	↓		Pipes	A B C D RM CTR FL CL			*	↓		↓	1.0
56	M PL S C CB PG CR B W V CT G FG OTHER:	Purple		Beam	A B C D RM CTR FL CL				↓		↓	0.4
57	M PL S C CB PG CR B W V CT G FG OTHER:	Black		Skylight	A B C D RM CTR FL CL				↓		↓	0.0
58	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
59	M PL S C CB PG CR B W V CT G FG OTHER:	Tan		Network	A B C D RM CTR FL CL				↓		MS Caterina	0.0
60	M PL S C CB PG CR B W V CT G FG OTHER:	↓		Ceiling	A B C D RM CTR FL CL				↓		↓	0.0
	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; * Glass; Condition: I = Intact; F = Fair; P = Poor; Initial Result: P = Positive; N = Negative;

G = Gypsum



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



Technical Report

prepared for:

WSP USA Solutions Inc. (New York, NY)

96 Morton Street, 8th Floor

New York NY, 10014

Attention: Alexander Smolyar

Report Date: 09/02/2021

Client Project ID: 31403475.004

York Project (SDG) No.: 21H1490

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
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STRATFORD, CT 06615
(203) 325-1371

132-02 89th AVENUE
FAX (203) 357-0166

RICHMOND HILL, NY 11418
ClientServices@yorklab.com

Report Date: 09/02/2021
Client Project ID: 31403475.004
York Project (SDG) No.: 21H1490

WSP USA Solutions Inc. (New York, NY)
96 Morton Street, 8th Floor
New York NY, 10014
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 30, 2021 and listed below. The project was identified as your project: **31403475.004**.

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.

<u>York Sample ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>
21H1490-01	A-01/02/03	Caulk	08/11/2021	08/30/2021
21H1490-02	B-04/05/06	Caulk	08/11/2021	08/30/2021
21H1490-03	C-07/08/09	Caulk	08/11/2021	08/30/2021
21H1490-04	D-10/11/12	Caulk	08/11/2021	08/30/2021
21H1490-05	E-13/14/15	Caulk	08/10/2021	08/30/2021
21H1490-06	F-16/17/18	Caulk	08/10/2021	08/30/2021
21H1490-07	H-22/23/24	Caulk	08/11/2021	08/30/2021
21H1490-08	I-25/26/27	Caulk	08/11/2021	08/30/2021
21H1490-09	J-28/29/30	Caulk	08/11/2021	08/30/2021
21H1490-10	G-19/20/21	Caulk	08/11/2021	08/30/2021
21H1490-11	K-31/32/33	Caulk	08/26/2021	08/30/2021
21H1490-12	L-34/35/36	Caulk	08/26/2021	08/30/2021

General Notes for York Project (SDG) No.: 21H1490

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: 09/02/2021

Cassie L. Mosher
Laboratory Manager





Sample Information

Client Sample ID: A-01/02/03

York Sample ID: 21H1490-01

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

21H1490

31403475.004

Caulk

August 11, 2021 3:00 pm

08/30/2021

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	HT-02	mg/kg	0.289	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:19	BJ
11104-28-2	Aroclor 1221	ND	HT-02	mg/kg	0.289	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:19	BJ
11141-16-5	Aroclor 1232	ND	HT-02	mg/kg	0.289	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:19	BJ
53469-21-9	Aroclor 1242	ND	HT-02	mg/kg	0.289	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:19	BJ
12672-29-6	Aroclor 1248	ND	HT-02	mg/kg	0.289	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:19	BJ
11097-69-1	Aroclor 1254	ND	HT-02	mg/kg	0.289	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:19	BJ
11096-82-5	Aroclor 1260	ND	HT-02	mg/kg	0.289	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:19	BJ
37324-23-5	Aroclor 1262	ND	HT-02	mg/kg	0.289	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 17:19	BJ
11100-14-4	Aroclor 1268	ND	HT-02	mg/kg	0.289	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 17:19	BJ
1336-36-3	* Total PCBs	ND	HT-02	mg/kg	0.289	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 17:19	BJ
Surrogate Recoveries		Result	Acceptance Range							
877-09-8	Surrogate: Tetrachloro-m-xylene	99.5 %	HT-02	30-140						
2051-24-3	Surrogate: Decachlorobiphenyl	63.0 %	HT-02	30-140						

Sample Information

Client Sample ID: B-04/05/06

York Sample ID: 21H1490-02

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

21H1490

31403475.004

Caulk

August 11, 2021 3:00 pm

08/30/2021

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	HT-02	mg/kg	0.311	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:33	BJ
11104-28-2	Aroclor 1221	ND	HT-02	mg/kg	0.311	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:33	BJ
11141-16-5	Aroclor 1232	ND	HT-02	mg/kg	0.311	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:33	BJ



Sample Information

Client Sample ID: B-04/05/06

York Sample ID: 21H1490-02

York Project (SDG) No.
21H1490

Client Project ID
31403475.004

Matrix
Caulk

Collection Date/Time
August 11, 2021 3:00 pm

Date Received
08/30/2021

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	HT-02	mg/kg	0.311	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:33	BJ
12672-29-6	Aroclor 1248	ND	HT-02	mg/kg	0.311	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:33	BJ
11097-69-1	Aroclor 1254	ND	HT-02	mg/kg	0.311	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:33	BJ
11096-82-5	Aroclor 1260	ND	HT-02	mg/kg	0.311	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:33	BJ
37324-23-5	Aroclor 1262	ND	HT-02	mg/kg	0.311	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 17:33	BJ
11100-14-4	Aroclor 1268	ND	HT-02	mg/kg	0.311	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 17:33	BJ
1336-36-3	* Total PCBs	ND	HT-02	mg/kg	0.311	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 17:33	BJ
Surrogate Recoveries		Result	Acceptance Range							
877-09-8	Surrogate: Tetrachloro-m-xylene	90.0 %	HT-02	30-140						
2051-24-3	Surrogate: Decachlorobiphenyl	61.0 %	HT-02	30-140						

Sample Information

Client Sample ID: C-07/08/09

York Sample ID: 21H1490-03

York Project (SDG) No.
21H1490

Client Project ID
31403475.004

Matrix
Caulk

Collection Date/Time
August 11, 2021 3:00 pm

Date Received
08/30/2021

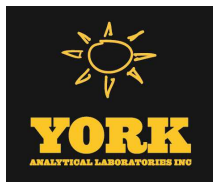
Polychlorinated Biphenyls (PCB)

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	HT-02	mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:47	BJ
11104-28-2	Aroclor 1221	ND	HT-02	mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:47	BJ
11141-16-5	Aroclor 1232	ND	HT-02	mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:47	BJ
53469-21-9	Aroclor 1242	ND	HT-02	mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:47	BJ
12672-29-6	Aroclor 1248	ND	HT-02	mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:47	BJ
11097-69-1	Aroclor 1254	ND	HT-02	mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:47	BJ
11096-82-5	Aroclor 1260	ND	HT-02	mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 17:47	BJ



Sample Information

Client Sample ID: C-07/08/09

York Sample ID: 21H1490-03

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

21H1490

31403475.004

Caulk

August 11, 2021 3:00 pm

08/30/2021

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	HT-02	mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 17:47	BJ
11100-14-4	Aroclor 1268	ND	HT-02	mg/kg	0.413	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 17:47	BJ
1336-36-3	* Total PCBs	ND	HT-02	mg/kg	0.413	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 17:47	BJ
Surrogate Recoveries		Result	Acceptance Range							
877-09-8	Surrogate: Tetrachloro-m-xylene	94.5 %	HT-02	30-140						
2051-24-3	Surrogate: Decachlorobiphenyl	69.0 %	HT-02	30-140						

Sample Information

Client Sample ID: D-10/11/12

York Sample ID: 21H1490-04

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

21H1490

31403475.004

Caulk

August 11, 2021 3:00 pm

08/30/2021

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	HT-02	mg/kg	0.420	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:00	BJ
11104-28-2	Aroclor 1221	ND	HT-02	mg/kg	0.420	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:00	BJ
11141-16-5	Aroclor 1232	ND	HT-02	mg/kg	0.420	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:00	BJ
53469-21-9	Aroclor 1242	ND	HT-02	mg/kg	0.420	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:00	BJ
12672-29-6	Aroclor 1248	ND	HT-02	mg/kg	0.420	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:00	BJ
11097-69-1	Aroclor 1254	ND	HT-02	mg/kg	0.420	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:00	BJ
11096-82-5	Aroclor 1260	ND	HT-02	mg/kg	0.420	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:00	BJ
37324-23-5	Aroclor 1262	ND	HT-02	mg/kg	0.420	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 18:00	BJ
11100-14-4	Aroclor 1268	ND	HT-02	mg/kg	0.420	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 18:00	BJ
1336-36-3	* Total PCBs	ND	HT-02	mg/kg	0.420	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 18:00	BJ
Surrogate Recoveries		Result	Acceptance Range							
877-09-8	Surrogate: Tetrachloro-m-xylene	89.5 %	HT-02	30-140						
2051-24-3	Surrogate: Decachlorobiphenyl	68.5 %	HT-02	30-140						



Sample Information

Client Sample ID: D-10/11/12

York Sample ID: 21H1490-04

<u>York Project (SDG) No.</u>	<u>Client Project ID</u>	<u>Matrix</u>	<u>Collection Date/Time</u>	<u>Date Received</u>
21H1490	31403475.004	Caulk	August 11, 2021 3:00 pm	08/30/2021

Sample Information

Client Sample ID: E-13/14/15

York Sample ID: 21H1490-05

<u>York Project (SDG) No.</u>	<u>Client Project ID</u>	<u>Matrix</u>	<u>Collection Date/Time</u>	<u>Date Received</u>
21H1490	31403475.004	Caulk	August 10, 2021 3:00 pm	08/30/2021

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	HT-02	mg/kg	0.355	1	EPA 8082A Certifications:	08/31/2021 12:54 NELAC-NY10854,CTDOH,NJDEP	09/01/2021 18:14	BJ
11104-28-2	Aroclor 1221		ND	HT-02	mg/kg	0.355	1	EPA 8082A Certifications:	08/31/2021 12:54 NELAC-NY10854,CTDOH,NJDEP	09/01/2021 18:14	BJ
11141-16-5	Aroclor 1232		ND	HT-02	mg/kg	0.355	1	EPA 8082A Certifications:	08/31/2021 12:54 NELAC-NY10854,CTDOH,NJDEP	09/01/2021 18:14	BJ
53469-21-9	Aroclor 1242		ND	HT-02	mg/kg	0.355	1	EPA 8082A Certifications:	08/31/2021 12:54 NELAC-NY10854,CTDOH,NJDEP	09/01/2021 18:14	BJ
12672-29-6	Aroclor 1248		ND	HT-02	mg/kg	0.355	1	EPA 8082A Certifications:	08/31/2021 12:54 NELAC-NY10854,CTDOH,NJDEP	09/01/2021 18:14	BJ
11097-69-1	Aroclor 1254		ND	HT-02	mg/kg	0.355	1	EPA 8082A Certifications:	08/31/2021 12:54 NELAC-NY10854,CTDOH,NJDEP	09/01/2021 18:14	BJ
11096-82-5	Aroclor 1260		ND	HT-02	mg/kg	0.355	1	EPA 8082A Certifications:	08/31/2021 12:54 NELAC-NY10854,CTDOH,NJDEP	09/01/2021 18:14	BJ
37324-23-5	Aroclor 1262		ND	HT-02	mg/kg	0.355	1	EPA 8082A Certifications:	08/31/2021 12:54 NELAC-NY10854,NJDEP	09/01/2021 18:14	BJ
11100-14-4	Aroclor 1268		ND	HT-02	mg/kg	0.355	1	EPA 8082A Certifications:	08/31/2021 12:54 NELAC-NY10854,NJDEP	09/01/2021 18:14	BJ
1336-36-3	* Total PCBs		ND	HT-02	mg/kg	0.355	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 18:14	BJ
Surrogate Recoveries			Result	Acceptance Range							
877-09-8	Surrogate: Tetrachloro-m-xylene	97.5 %	HT-02	30-140							
2051-24-3	Surrogate: Decachlorobiphenyl	72.0 %	HT-02	30-140							

Sample Information

Client Sample ID: F-16/17/18

York Sample ID: 21H1490-06

<u>York Project (SDG) No.</u>	<u>Client Project ID</u>	<u>Matrix</u>	<u>Collection Date/Time</u>	<u>Date Received</u>
21H1490	31403475.004	Caulk	August 10, 2021 3:00 pm	08/30/2021

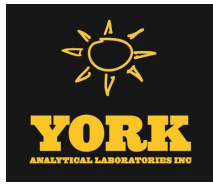
Polychlorinated Biphenyls (PCB)

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
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@		



Sample Information

Client Sample ID: F-16/17/18

York Sample ID: 21H1490-06

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

21H1490

31403475.004

Caulk

August 10, 2021 3:00 pm

08/30/2021

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	HT-02	mg/kg	0.365	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:27	BJ
11104-28-2	Aroclor 1221	ND	HT-02	mg/kg	0.365	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:27	BJ
11141-16-5	Aroclor 1232	ND	HT-02	mg/kg	0.365	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:27	BJ
53469-21-9	Aroclor 1242	ND	HT-02	mg/kg	0.365	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:27	BJ
12672-29-6	Aroclor 1248	ND	HT-02	mg/kg	0.365	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:27	BJ
11097-69-1	Aroclor 1254	ND	HT-02	mg/kg	0.365	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:27	BJ
11096-82-5	Aroclor 1260	ND	HT-02	mg/kg	0.365	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:27	BJ
37324-23-5	Aroclor 1262	ND	HT-02	mg/kg	0.365	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 18:27	BJ
11100-14-4	Aroclor 1268	ND	HT-02	mg/kg	0.365	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 18:27	BJ
1336-36-3	* Total PCBs	ND	HT-02	mg/kg	0.365	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 18:27	BJ
Surrogate Recoveries		Result	Acceptance Range							
877-09-8	Surrogate: Tetrachloro-m-xylene	101 %	HT-02	30-140						
2051-24-3	Surrogate: Decachlorobiphenyl	62.0 %	HT-02	30-140						

Sample Information

Client Sample ID: H-22/23/24

York Sample ID: 21H1490-07

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

21H1490

31403475.004

Caulk

August 11, 2021 3:00 pm

08/30/2021

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	HT-02	mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:41	BJ
11104-28-2	Aroclor 1221	ND	HT-02	mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:41	BJ
11141-16-5	Aroclor 1232	ND	HT-02	mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:41	BJ
53469-21-9	Aroclor 1242	ND	HT-02	mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:41	BJ



Sample Information

Client Sample ID: H-22/23/24

York Sample ID: 21H1490-07

York Project (SDG) No.
21H1490

Client Project ID
31403475.004

Matrix
Caulk

Collection Date/Time
August 11, 2021 3:00 pm

Date Received
08/30/2021

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
12672-29-6	Aroclor 1248		ND	HT-02	mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:41	BJ
11097-69-1	Aroclor 1254		ND	HT-02	mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:41	BJ
11096-82-5	Aroclor 1260		ND	HT-02	mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:41	BJ
37324-23-5	Aroclor 1262		ND	HT-02	mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 18:41	BJ
11100-14-4	Aroclor 1268		ND	HT-02	mg/kg	0.410	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 18:41	BJ
1336-36-3	* Total PCBs		ND	HT-02	mg/kg	0.410	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 18:41	BJ
Surrogate Recoveries			Result	Acceptance Range							
877-09-8	Surrogate: Tetrachloro-m-xylene		84.5 %	HT-02	30-140						
2051-24-3	Surrogate: Decachlorobiphenyl		58.0 %	HT-02	30-140						

Sample Information

Client Sample ID: I-25/26/27

York Sample ID: 21H1490-08

York Project (SDG) No.
21H1490

Client Project ID
31403475.004

Matrix
Caulk

Collection Date/Time
August 11, 2021 3:00 pm

Date Received
08/30/2021

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	HT-02	mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:54	BJ
11104-28-2	Aroclor 1221	ND	HT-02	mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:54	BJ
11141-16-5	Aroclor 1232	ND	HT-02	mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:54	BJ
53469-21-9	Aroclor 1242	ND	HT-02	mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:54	BJ
12672-29-6	Aroclor 1248	ND	HT-02	mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:54	BJ
11097-69-1	Aroclor 1254	ND	HT-02	mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:54	BJ
11096-82-5	Aroclor 1260	ND	HT-02	mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 18:54	BJ
37324-23-5	Aroclor 1262	ND	HT-02	mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 18:54	BJ



Sample Information

Client Sample ID: I-25/26/27

York Sample ID: 21H1490-08

York Project (SDG) No.
21H1490

Client Project ID
31403475.004

Matrix
Caulk

Collection Date/Time
August 11, 2021 3:00 pm

Date Received
08/30/2021

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
11100-14-4	Aroclor 1268	ND	HT-02	mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 18:54	BJ
1336-36-3	* Total PCBs	ND	HT-02	mg/kg	0.427	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 18:54	BJ
Surrogate Recoveries		Result		Acceptance Range						
877-09-8	Surrogate: Tetrachloro-m-xylene	48.0 %	HT-02		30-140					
2051-24-3	Surrogate: Decachlorobiphenyl	50.0 %	HT-02		30-140					

Sample Information

Client Sample ID: J-28/29/30

York Sample ID: 21H1490-09

York Project (SDG) No.
21H1490

Client Project ID
31403475.004

Matrix
Caulk

Collection Date/Time
August 11, 2021 3:00 pm

Date Received
08/30/2021

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	HT-02	mg/kg	0.439	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:08	BJ
11104-28-2	Aroclor 1221	ND	HT-02	mg/kg	0.439	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:08	BJ
11141-16-5	Aroclor 1232	ND	HT-02	mg/kg	0.439	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:08	BJ
53469-21-9	Aroclor 1242	ND	HT-02	mg/kg	0.439	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:08	BJ
12672-29-6	Aroclor 1248	ND	HT-02	mg/kg	0.439	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:08	BJ
11097-69-1	Aroclor 1254	ND	HT-02	mg/kg	0.439	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:08	BJ
11096-82-5	Aroclor 1260	ND	HT-02	mg/kg	0.439	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:08	BJ
37324-23-5	Aroclor 1262	ND	HT-02	mg/kg	0.439	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 19:08	BJ
11100-14-4	Aroclor 1268	ND	HT-02	mg/kg	0.439	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 19:08	BJ
1336-36-3	* Total PCBs	ND	HT-02	mg/kg	0.439	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 19:08	BJ
Surrogate Recoveries		Result		Acceptance Range						
877-09-8	Surrogate: Tetrachloro-m-xylene	61.5 %	HT-02		30-140					
2051-24-3	Surrogate: Decachlorobiphenyl	61.0 %	HT-02		30-140					



Sample Information

Client Sample ID: G-19/20/21

York Sample ID: 21H1490-10

York Project (SDG) No.
21H1490

Client Project ID
31403475.004

Matrix
Caulk

Collection Date/Time
August 11, 2021 3:00 pm

Date Received
08/30/2021

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	HT-02	mg/kg	0.325	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:22	BJ
11104-28-2	Aroclor 1221	ND	HT-02	mg/kg	0.325	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:22	BJ
11141-16-5	Aroclor 1232	ND	HT-02	mg/kg	0.325	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:22	BJ
53469-21-9	Aroclor 1242	ND	HT-02	mg/kg	0.325	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:22	BJ
12672-29-6	Aroclor 1248	ND	HT-02	mg/kg	0.325	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:22	BJ
11097-69-1	Aroclor 1254	ND	HT-02	mg/kg	0.325	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:22	BJ
11096-82-5	Aroclor 1260	ND	HT-02	mg/kg	0.325	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:22	BJ
37324-23-5	Aroclor 1262	ND	HT-02	mg/kg	0.325	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 19:22	BJ
11100-14-4	Aroclor 1268	ND	HT-02	mg/kg	0.325	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 19:22	BJ
1336-36-3	* Total PCBs	ND	HT-02	mg/kg	0.325	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 19:22	BJ
Surrogate Recoveries		Result	Acceptance Range							
877-09-8	Surrogate: Tetrachloro-m-xylene	87.0 %	HT-02	30-140						
2051-24-3	Surrogate: Decachlorobiphenyl	62.0 %	HT-02	30-140						

Sample Information

Client Sample ID: K-31/32/33

York Sample ID: 21H1490-11

York Project (SDG) No.
21H1490

Client Project ID
31403475.004

Matrix
Caulk

Collection Date/Time
August 26, 2021 3:00 pm

Date Received
08/30/2021

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	0.394	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:31	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.394	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:31	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.394	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:31	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.394	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:31	BJ



Sample Information

Client Sample ID: K-31/32/33

York Sample ID: 21H1490-11

York Project (SDG) No.
21H1490

Client Project ID
31403475.004

Matrix
Caulk

Collection Date/Time
August 26, 2021 3:00 pm

Date Received
08/30/2021

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
12672-29-6	Aroclor 1248	ND		mg/kg	0.394	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:31	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.394	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:31	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.394	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:31	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.394	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 13:07	09/02/2021 03:31	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.394	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 13:07	09/02/2021 03:31	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.394	1	EPA 8082A Certifications:	08/31/2021 13:07	09/02/2021 03:31	BJ
Surrogate Recoveries		Result		Acceptance Range						
877-09-8	Surrogate: Tetrachloro-m-xylene	69.0 %		30-140						
2051-24-3	Surrogate: Decachlorobiphenyl	52.5 %		30-140						

Sample Information

Client Sample ID: L-34/35/36

York Sample ID: 21H1490-12

York Project (SDG) No.
21H1490

Client Project ID
31403475.004

Matrix
Caulk

Collection Date/Time
August 26, 2021 3:00 pm

Date Received
08/30/2021

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	0.360	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:45	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.360	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:45	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.360	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:45	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.360	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:45	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.360	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:45	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.360	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:45	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.360	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:45	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.360	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 13:07	09/02/2021 03:45	BJ



Sample Information

Client Sample ID: L-34/35/36

York Sample ID: 21H1490-12

York Project (SDG) No.
21H1490

Client Project ID
31403475.004

Matrix
Caulk

Collection Date/Time
August 26, 2021 3:00 pm

Date Received
08/30/2021

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
11100-14-4	Aroclor 1268	ND		mg/kg	0.360	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 13:07	09/02/2021 03:45	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.360	1	EPA 8082A Certifications:	08/31/2021 13:07	09/02/2021 03:45	BJ
Surrogate Recoveries		Result		Acceptance Range						
877-09-8	Surrogate: Tetrachloro-m-xylene	77.5 %		30-140						
2051-24-3	Surrogate: Decachlorobiphenyl	56.0 %		30-140						



Analytical Batch Summary

Batch ID: BH11755

Preparation Method: EPA 3550C

Prepared By: EMS

YORK Sample ID	Client Sample ID	Preparation Date
21H1490-01	A-01/02/03	08/31/21
21H1490-02	B-04/05/06	08/31/21
21H1490-03	C-07/08/09	08/31/21
21H1490-04	D-10/11/12	08/31/21
21H1490-05	E-13/14/15	08/31/21
21H1490-06	F-16/17/18	08/31/21
21H1490-07	H-22/23/24	08/31/21
21H1490-08	I-25/26/27	08/31/21
21H1490-09	J-28/29/30	08/31/21
21H1490-10	G-19/20/21	08/31/21
BH11755-BLK1	Blank	08/31/21
BH11755-BS1	LCS	08/31/21
BH11755-BSD1	LCS Dup	08/31/21

Batch ID: BH11758

Preparation Method: EPA 3550C

Prepared By: EMS

YORK Sample ID	Client Sample ID	Preparation Date
21H1490-11	K-31/32/33	08/31/21
21H1490-12	L-34/35/36	08/31/21
BH11758-BLK1	Blank	08/31/21
BH11758-BS1	LCS	08/31/21
BH11758-BSD1	LCS Dup	08/31/21



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
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Batch BH11755 - EPA 3550C

Blank (BH11755-BLK1)

Prepared: 08/31/2021 Analyzed: 09/01/2021

Aroclor 1016	ND	0.0166	mg/kg								
Aroclor 1221	ND	0.0166	"								
Aroclor 1232	ND	0.0166	"								
Aroclor 1242	ND	0.0166	"								
Aroclor 1248	ND	0.0166	"								
Aroclor 1254	ND	0.0166	"								
Aroclor 1260	ND	0.0166	"								
Aroclor 1262	ND	0.0166	"								
Aroclor 1268	ND	0.0166	"								
Total PCBs	ND	0.0166	"								
Surrogate: Tetrachloro-m-xylene	0.0601		"	0.0664		90.5	30-140				
Surrogate: Decachlorobiphenyl	0.0385		"	0.0664		58.0	30-140				

LCS (BH11755-BS1)

Prepared: 08/31/2021 Analyzed: 09/01/2021

Aroclor 1016	0.359	0.0166	mg/kg	0.332		108	40-130				
Aroclor 1260	0.342	0.0166	"	0.332		103	40-130				
Surrogate: Tetrachloro-m-xylene	0.0571		"	0.0664		86.0	30-140				
Surrogate: Decachlorobiphenyl	0.0382		"	0.0664		57.5	30-140				

LCS Dup (BH11755-BSD1)

Prepared: 08/31/2021 Analyzed: 09/01/2021

Aroclor 1016	0.360	0.0166	mg/kg	0.332		108	40-130	0.333	25		
Aroclor 1260	0.341	0.0166	"	0.332		103	40-130	0.545	25		
Surrogate: Tetrachloro-m-xylene	0.0575		"	0.0664		86.5	30-140				
Surrogate: Decachlorobiphenyl	0.0379		"	0.0664		57.0	30-140				

Batch BH11758 - EPA 3550C

Blank (BH11758-BLK1)

Prepared: 08/31/2021 Analyzed: 09/02/2021

Aroclor 1016	ND	0.0166	mg/kg								
Aroclor 1221	ND	0.0166	"								
Aroclor 1232	ND	0.0166	"								
Aroclor 1242	ND	0.0166	"								
Aroclor 1248	ND	0.0166	"								
Aroclor 1254	ND	0.0166	"								
Aroclor 1260	ND	0.0166	"								
Aroclor 1262	ND	0.0166	"								
Aroclor 1268	ND	0.0166	"								
Total PCBs	ND	0.0166	"								
Surrogate: Tetrachloro-m-xylene	0.0508		"	0.0664		76.5	30-140				
Surrogate: Decachlorobiphenyl	0.0355		"	0.0664		53.5	30-140				



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
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Batch BH11758 - EPA 3550C

LCS (BH11758-BS1)

Prepared: 08/31/2021 Analyzed: 09/02/2021

Aroclor 1016	0.327	0.0166	mg/kg	0.332		98.4	40-130				
Aroclor 1260	0.301	0.0166	"	0.332		90.6	40-130				
Surrogate: Tetrachloro-m-xylene	0.0542		"	0.0664		81.5	30-140				
Surrogate: Decachlorobiphenyl	0.0336		"	0.0664		50.5	30-140				

LCS Dup (BH11758-BS1)

Prepared: 08/31/2021 Analyzed: 09/02/2021

Aroclor 1016	0.317	0.0166	mg/kg	0.332		95.5	40-130	2.99	25		
Aroclor 1260	0.300	0.0166	"	0.332		90.3	40-130	0.354	25		
Surrogate: Tetrachloro-m-xylene	0.0528		"	0.0664		79.5	30-140				
Surrogate: Decachlorobiphenyl	0.0349		"	0.0664		52.5	30-140				

Batch Y110210 - BH11681

Aroclor Reference (Y110210-ARC1)

Prepared & Analyzed: 09/01/2021

Surrogate: Tetrachloro-m-xylene	0.179		ug/mL	0.200		89.5					
Surrogate: Decachlorobiphenyl	0.144		"	0.200		72.0					





Sample and Data Qualifiers Relating to This Work Order

HT-02 NON-COMPLIANT-This sample was received outside the EPA recommended holding time.

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.

PAGE 1 OF 3

21#1490

WSP PROJ #: 31403475.004

CLIENT:	Birdcliff Manor	UFSD
Project Site:	Birdcliff Manor	HSMS
Project Manager:	A. Smolyar	

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

<u>LOCATION(S) SURVEYED</u>	<u>Roof / Exterior</u>

PROPOSED PROJECT: Renovation

DATE(S) OF INSPECTION: 8/11/2021

Inspector(s) STEPHEN GRUBER, NICHOLAS COLANINNI

RESULTS TO:

☐ 48 HR ☐ 72 HR ☐ 96 HR ☐ 120 HR

0X.	
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FIELD NOTES

APPROX.
QUANTITY
(LF/SF)

SAMPLE LOCATION

MATERIAL DESCRIPTION

SAMPLE

HA

LAB
SAMPLE

Exterior - 2nd Fl. (N)
(W) ↑
(S) ↑

Roof G-South

Root A

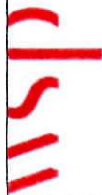
Root K

Roof G

CHAIN OF CUSTODY

Listed by:		Relinquished by:		Relinquished by:		Received by:	
(Sgn)	AMPM	(Sgn)	AMPM	(Sgn)	AMPM	(Sgn)	AMPM
STEPHEN GREEN	8 30/21	8 30/21	12 35	18100	8 30/21	8 30/21	8 30/21
by:		Received by:		Received by:		Received by:	

LAB INSTRUCTIONS: create one (1) composite sample of each homogeneous material from equal mass portions (\pm 5%) of the three (3) sub-samples for extraction and analysis via EPA Method 8082



PCB SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 2 OF 3

21H490

WSP PROJ #: 31403475.004 CLIENT: Briercliff Manor UFSO Project Site: Briercliff Manor HSMS Project Manager: A. Smolyar			LOCATION(S) SURVEYED: Roof / Exterior PROPOSED PROJECT: Renovation DATE(S) OF INSPECTION: 8/10/2021 Inspector(s): STEPHEN GAIBER, NICHOLAS COLOAN RESULTS TO: Alexander Smolyar @wsp.com LAB RESULTS: Lb. lab results @wsp.com			TURNAROUND TIME: <input type="checkbox"/> 48 HR <input type="checkbox"/> 72 HR <input type="checkbox"/> 96 HR <input type="checkbox"/> 120 HR		
LAB SAMPLE NO.	HA	SAMPLE NO.	MATERIAL DESCRIPTION	SAMPLE LOCATION	APPROX. QUANTITY (LF/SF)	FIELD NOTES		
A 1	↓	1	Exterior - 2nd Flr. (N)	SG 8/11/21				
2	↓	2	(W)	SG 8/11/21				
3	↓	3	(S)	SG 8/11/21				
E 13	↓	13	Caulking (white) on	Roof B				
↓	↓	14	Metal cap Flashing	Roof G				
↓	↓	15	↓	↓				
F 16	↓	16	Expansion Joint Caulking	Roof K		Door Frame		
↓	↓	17	(Grey) at Brick wall	↓		Steel Beam		
↓	↓	18	↓	↓				
G 19	↓	19	Caulking (Grey) assoc.	Roof H				
↓	↓	20	w/ Vent Pipes	↓				
↓	↓	21	↓	Roof J				

CHAIN OF CUSTODY Relinquished by: <u>Stephen Gaiber</u> (Sgn) <u>8/24/21</u> AM/PM Received by: <u>Francisco</u> (Sgn) <u>8/30/21</u> AM/PM Relinquished by: <u>Francisco</u> (Sgn) <u>8/30/21</u> AM/PM Received by: <u>Francisco</u> (Sgn) <u>8/30/21</u> AM/PM				1.602
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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 Arachnids listed (Arachnids 1016 Arachnids 1221 Arachnids 1232 Arachnids 1242 Arachnids 1254 Arachnids 1260). The laboratory shall target a PCR detection limit of 1 nm



PCB SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 3 OF 4

WSP PROJ #: 31403475.004

CLIENT: Brarcliff Manor UFSO

Project Site: Brarcliff Manor HSMS

Project Manager: A. Smolyar

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

LOCATION(S) SURVEYED Roof / Exterior

PROPOSED PROJECT: Renovation

DATE(S) OF INSPECTION: 8/11/2021

Inspector(s) STEPHEN GRUBER, NICHOLAS COLONNI

RESULTS TO:

TURNAROUND TIME:

☐ 48 HR ☐ 72 HR ☐ 96 HR ☐ 120 HR

LAB SAMPLE NO.	HA	SAMPLE NO.	MATERIAL DESCRIPTION	SAMPLE LOCATION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
H	22		Caulking (white) assoc.	Roof G		
↓	23		w / Ductwork	↓		
↓	24		↓	↓		
I	25		Caulking (Black) assoc.	↓		
↓	26		w / Square skylight	↓		
↓	27		Panels	↓		
T	28		Caulking (Black) assoc.	Roof B - North		
↓	29		w / Metal Cap Flashing	↓		
↓	30		↓	↓		
B	19		Exterior - Adi M.S. Coating	Sidewalk/Brick Expansion		
↓	20		↓	Joint Caulking (grey)		
↓	21		↓	↓		

CHAIN OF CUSTODY

Relinquished by (print)	Received by (print)	Relinquished by (print)	Received by (print)	Relinquished by (print)	Received by (print)
Stephen Gruber	8/30/21	8/30/21	8/30/21	8/30/21	8/30/21
Signature	Signature	Signature	Signature	Signature	Signature
8/30/21	8/30/21	8/30/21	8/30/21	8/30/21	8/30/21

PAGE 4 OF 9

21H1490

Project Manager: A. Smolya

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

Inspector(s) STEPHEN GRUBER, NICHOLAS CASALE

Alexander Smolovskoe.com

TURNAROUND TIME: ☒ 1 WEEK
☐ 48 HR ☐ 72 HR ☐ 96 HR ☐ 120 HR

SAMPLE LOCATION

APPROX.
QUANTITY
(LF/SF)

FIELD NOTES

Fuel/oil Enclosure

Cavities

33

7	34
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Excursion To: Cav/kw, Gt

~~Ch. back wall~~ (Baris)

36

✓ Bud Re 131

Page No. / Date

Page 22 of 22

ed by:	(Sign)
TERREN GUNDEL	

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8/30/21	APM
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Relinquished by: Spencer
(print)

Sec.
Francisco Yofl

5/30/24

Relinquished by: 18:00
(print) ALPNI

6/5/2019

B

8	30	21
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1928
AM/PM

LAB INSTRUCTIONS: create one (1) composite sample of each homogeneous material from equal mass portions ($\pm 5\%$) of the three (3) sub-samples for extraction and analysis via EPA Method 8082 and report the Aroclors 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 nm.



**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.
8th Floor
96 Morton Street
New York, NY 10014

FILE NUMBER:
LICENSE NUMBER: 132876
LICENSE CLASS: RESTRICTED
DATE OF ISSUE: 03/31/2021
EXPIRATION DATE: 03/31/2022

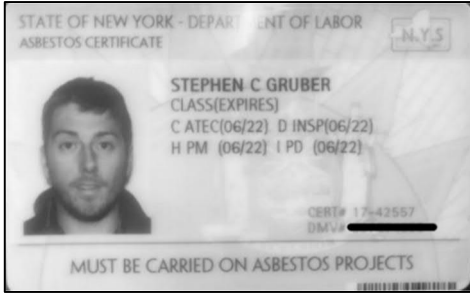
Duly Authorized Representative – Craig Napolitano:

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



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-1/219874-1

Certification #

November 28, 2020

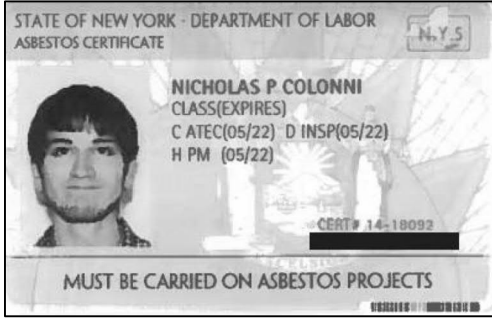
Issued On



Ben Conetta

Ben Conetta, Chief

Chemicals and Multimedia Programs Branch



United States Environmental Protection Agency

This is to certify that

Nicholas P Colonna

Inspector

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:

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

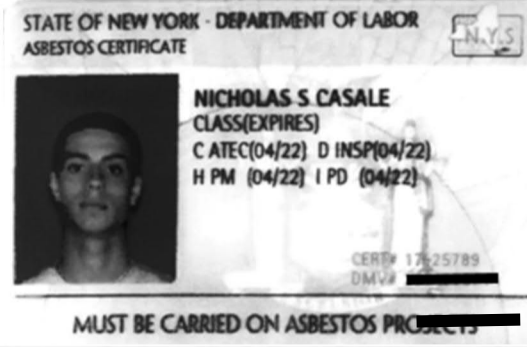
October 24, 2022

John Gorman, Chief

Pesticides & Toxic Substances Branch

LBP-1-1208881-1
Certification #
October 10, 2019
Issued On





United States Environmental Protection Agency

This is to certify that

Nicholas S Casale



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 September 24, 2022

LBP-I-1207478-1

Certification #

September 10, 2019

Issued On

John Gorman, Chief

Pesticides & Toxic Substances Branch

**NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER**



Expires 12:01 AM April 01, 2022
Issued April 01, 2021

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.: 63260

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.



500 Summit Lake Drive,
Suite 450
Valhalla, NY 10595

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 Communiqué dated January 2009).*

2020-10-01 through 2021-09-30

Effective Dates



For the National Voluntary Laboratory Accreditation Program



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

<input checked="" type="checkbox"/>	INDUSTRIAL HYGIENE	Accreditation Expires: August 01, 2023
<input checked="" type="checkbox"/>	ENVIRONMENTAL LEAD	Accreditation Expires: August 01, 2023
<input checked="" type="checkbox"/>	ENVIRONMENTAL MICROBIOLOGY	Accreditation Expires: August 01, 2023
<input type="checkbox"/>	FOOD	Accreditation Expires:
<input type="checkbox"/>	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

Revision 191: 07/28/2021

Date Issued: 07/28/2021



**APPENDIX H:
SCOPE OF WORK DRAWINGS**

Braircliff MANOR HSMS PHASE 1

Briarcliff Manor HSMS Phase 1 (BBS File No.21-274A)	
A4	Firestop/seal penetrations and top of wall in Auditorium Mechanical Rm., Switchgear Rm. and Art Rm. at High School.
A9	Repair missing spray applied fireproofing over structural steel columns/braces in Mechanical Room at Middle School.
A10	Firestop/seal penetrations and top of wall in Electrical Rm. (near Rm. 218) at Middle School.
A16	Remove manual hold open devices at Gymnasium Corridor doors (replace door closer or add magnetic holders).
A17	Remove floor stops (w/ padlocks) in Boys/Girls toilet rooms at High School (near Rm. 120).
A24	Replace EPDM roof areas (2002) and modify masonry/flashing (excludes Gym) at Middle School.
A25	Replace damaged/clogged roof leader and scupper (near loading dock) at Middle School.
A26	Replace EPDM roof areas (1998), skylights and modify masonry/flashing (excludes Gym) at High School.
M1	It was reported that the building exhaust fans were controlled by an old day/night control system, that no longer works. This system should be repaired or replaced, as these fans are required to operate whenever the school is occupied. This is one of a few control system items, which are all priced individually, but should be addressed as a whole.
M2	Replace the non-functional exhaust fan in the main electrical meter room to restore to operation.
M4	Provide an exhaust fan in the copy room adjacent to the nurses office, and vent directly to the exterior. The current fan exhausts into the hallway currently.
M5	Provide a new transfer grille in the art room 121 storage room to restore to original operation. Original grille has been permanently covered over.
M15	Replace 15 original rooftop exhaust fans, which are at or nearing end of life expectancy, to restore to proper operation.
P1	Provide air gaps on all kitchen equipment drains as required by code.
P6	Repair or provide a new domestic hot water recirculation system and pumps for the Middle School to allow for hot water in the building in a timely manner as required by code.
E1	The HS has a combination off bell/strobe units as well as horn/stroke units, which is not allowed by code. Convert all existing bell/strobe units over to the more prevalent horn/strobe unit configuration. Assume 50 units.
E5	Provide exit and emergency lighting in the HS chorus room, as it is classified as an area of assembly, and requires same.
E6	Provide exit lighting, emergency lighting, horn/strobe units and fire alarm pull stations in the library courtyard.
E7	Firestop all penetrations in the MS second floor electrical room as required by code.
E9	Provide magnetic hold open devices on large group spaces including the theatre, libraries, band/chorus rooms, gymnasiums, student cafeterias, etc., to allow for lockdowns as discussed. Assume 20 doors total.
A7	Create alcove and reverse door swing toward corridor in spaces over 1000 sf at Classrooms 101/102 and 209/210 (with folding partitions) at Middle School.
A18	Create alcove and reverse door swing toward corridor in spaces over 1000 sf at Classrooms 100, 101, 103, 104, 134 and 229 at High School.
Total	

Braircliff MANOR HSMS PHASE 2

Briarcliff Manor HSMS Phase 2 (BBS File No.21-274C)	
A6	Provide required rated separation between Maresca Center and Corridor with doors/partition (near Rm. 102) at High School.
A15	Remove corridor lockers where egress width is reduced to less than 8'-0" wide when locker doors are open at High School.
A21	Replace guardrail/ballusters and handrails in interior stairwells (four locations) at High School.
A22	Replace damaged, coated or bulging brick and tuckpoint mortar joints (both sides) at fuel tank/electrical enclosure. Tuckpoint mortar joints and replace damaged brick at High School.
N/A	Infill Light Well
M3	Uncover the combustion air intake louver in the boiler room, and provide a motorized damper to automatically close the damper when the boilers are not firing.
M8	Repair the insulation on the MS cafeteria ductwork to eliminate condensation from dripping down onto the ceiling and then on down to the walls and floor.
M10	Repair the insulation on the duct above the ceiling in HS room 110, which also drips onto the ceiling, and eventually down into the space.
M11	Provide a Variable Frequency Drive (VFD) on the MS Cafeteria chilled water A/C unit supply fan, add a humidity sensor, and add controls to allow for the unit to better dehumidify the cafeteria, which is reported to get cool and humid.
M12	Repair the chilled water pipe insulation in the MS/HS, especially at valves or saddles, where condensation forms and leaks down onto the hung ceiling tiles.
M18	Replace 7 older Carrier rooftop HVAC units, which are nearing the end of their life expectancy. New units will also improve comfort conditions and system energy efficiency. The units on the gyms will be replaced as part of the current gym roof replacement.
P2	Perform maintenance on the acid neutralizing pit in the HS electrical room adjacent to room 110, to reduce odors and restore system to proper operation.
P7	Provide a natural gas leak detection system in the boiler room area.
P14	Replace nine waterless urinals with new low flow urinals.
E22	Provide hardwired carbon monoxide detectors tied into the building's fire alarm system to replace the current battery and line voltage detectors.
A19	Enlarge and renovate student toilet rooms for ADA accessibility at High School (four locations).
N/A	Student Learning Exchange
Total	

Braircliff MANOR HSMS PHASE 3

Briarcliff Manor HSMS Phase 3 (BBS File No.21-274E)	
A3	Replace guardrail at exterior Auditorium ramp with proper height and baluster spacing at High School.
A23	Replace exterior concrete stairs/handrails at parking lot (3) and upper level tennis courts. (excludes MS entry and MS Cafeteria stairs).
A28	Security vestibule upgrades (transaction window and security film over existing glazing at High School and Middle School.
A33	Replace carpet in Music Rm. 90 at Middle School.
A37	Replace Auditorium seating (200 seats) at Middle School.
A38	Provide single key system (replace 200 cores) at High School.
M21	Upgrade the entire Automatic Temperature Control (ATC) system which currently consists of an older JCI Metasys panel as well as original pneumatic controls. Provide a new full DDC System to improve overall comfort levels, as well as eliminating the resultant over and under heating conditions. Provide new temperature sensors with a three degree adjustment band and an override feature.
M22	Provide Rawal Valves and new humidity controls for the HS Cafeteria rooftop unit to reduce the humidity in the space.
P12	Provide trap seals on floor drains that continuously dry out as discussed.
E29	Provide surge suppression at the main switchgear location to eliminate power surges.
Total	

BUILDING GENERAL NOTES:

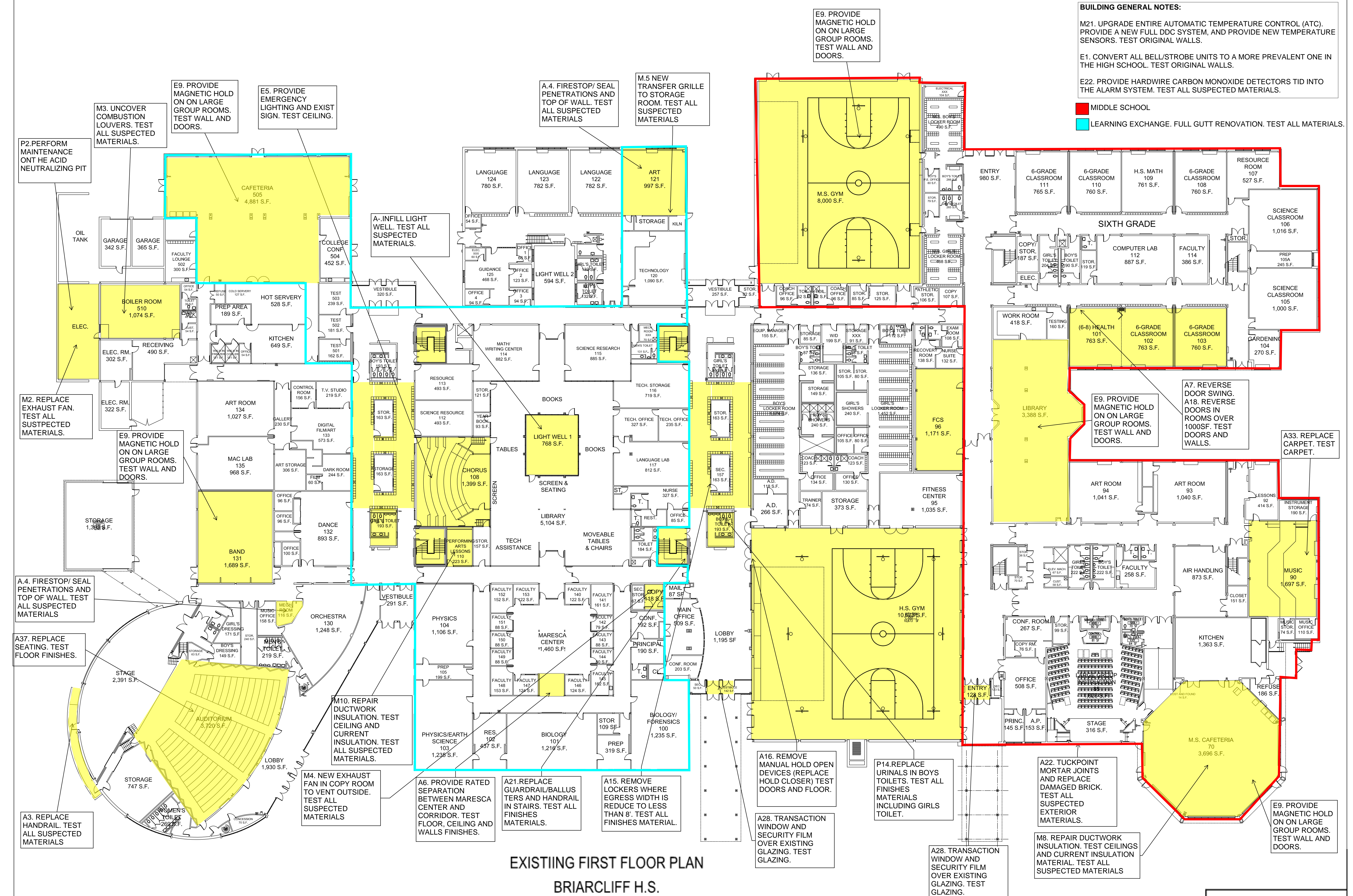
M21. UPGRADE ENTIRE AUTOMATIC TEMPERATURE CONTROL (ATC). PROVIDE A NEW FULL DDC SYSTEM, AND PROVIDE NEW TEMPERATURE SENSORS. TEST ORIGINAL WALLS.

E1. CONVERT ALL BELL/SROBE UNITS TO A MORE PREVALENT ONE IN THE HIGH SCHOOL. TEST ORIGINAL WALLS.

E22. PROVIDE HARDWARE CARBON MONOXIDE DETECTORS TID INTO THE ALARM SYSTEM. TEST ALL SUSPECTED MATERIALS.

■ MIDDLE SCHOOL

■ LEARNING EXCHANGE. FULL GUTT RENOVATION. TEST ALL MATERIALS.

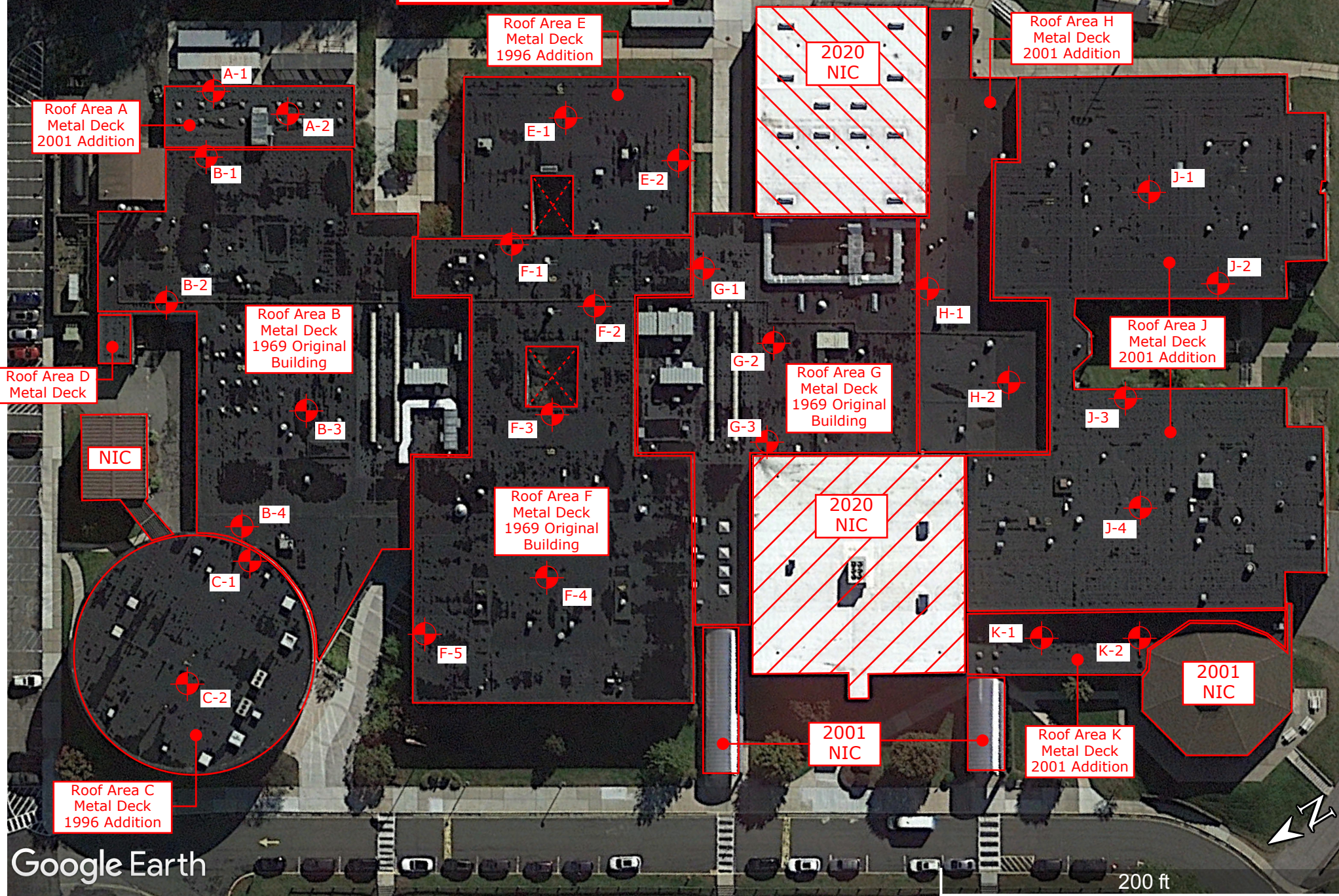


Briarcliff Manor HSMS

Roof Core Cuts

- | | | | |
|--------|---------|---------|---------|
| 1. A-1 | 8. E-1 | 15. G-1 | 22. J-3 |
| 2. A-2 | 9. E-2 | 16. G-2 | 23. J-4 |
| 3. B-1 | 10. F-1 | 17. G-3 | 24. K-1 |
| 4. B-2 | 11. F-2 | 18. H-1 | 25. K-2 |
| 5. B-3 | 12. F-3 | 19. H-2 | |
| 6. B-4 | 13. F-4 | 20. J-1 | |
| 7. C-1 | 14. F-5 | 21. J-2 | |
| 8. C-2 | | | |

Legend





**APPENDIX I:
PHOTOGRAPHIC DOCUMENTATION**

 <div> 500 Summit Lake Drive, Suite 450 Valhalla, NY 10595 </div>	<h1>PHOTOGRAPHIC DOCUMENTATION</h1>	
Client: Briarcliff Manor Union Free School District	Project Name: Final Report of Environmental Services for Phase 1, 2 & 3 Project at Briarcliff Middle/High School	WSP Project No.: 31403475.004

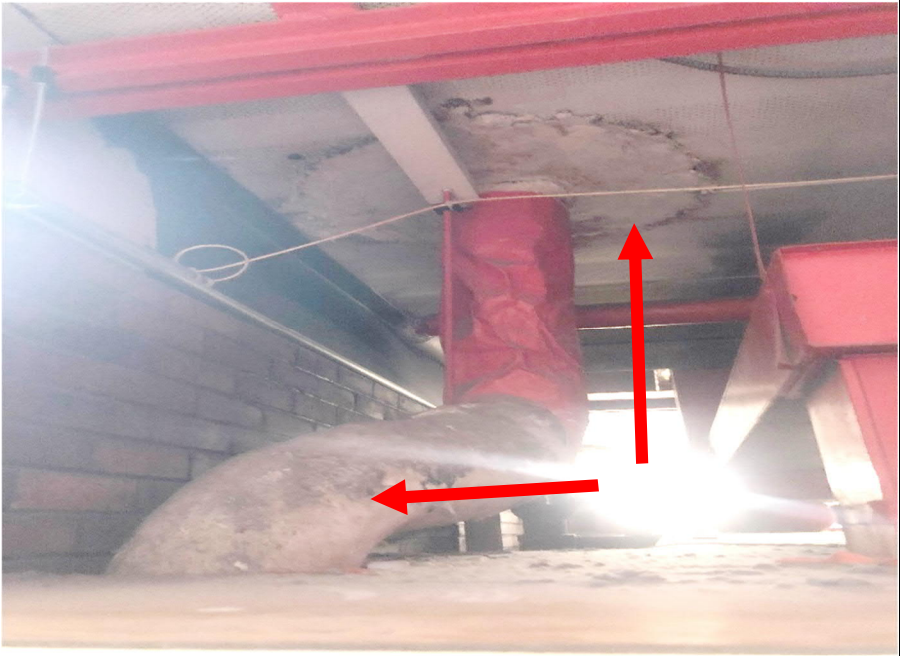
<div> <div>PHOTO No.:</div> <div>1</div> </div>
<div>DESCRIPTION:</div> <div>Roof Area G</div> <div>Tar (black) at base of AHU (Air Handling Unit) kerbs (typical) confirmed to be ACM</div>




<div> <div>PHOTO No.:</div> <div>2</div> </div>
<div>DESCRIPTION:</div> <div>Interior, 1st Floor, Maresca Center</div> <div>Joint Compound (tan) (typical) confirmed to be ACM</div>



 <div> 500 Summit Lake Drive, Suite 450 Valhalla, NY 10595 </div>	<h1>PHOTOGRAPHIC DOCUMENTATION</h1>	
Client: Briarcliff Manor Union Free School District	Project Name: Final Report of Environmental Services for Phase 1, 2 & 3 Project at Briarcliff Middle/High School	WSP Project No.: 31403475.004

<div> <div>PHOTO No.:</div> <div>3</div> </div>	
<div>DESCRIPTION:</div> <div> <p>Interior, 1st Floor, Ceiling Area (typical) above A & C Wing Boys and Girls Toilets</p> <p>Cementitious material (white) under roof drains confirmed to be ACM and Pipe Elbows confirmed to be ACM (As per 2019 AHERA)</p> </div>	

<div> <div>PHOTO No.:</div> <div>4</div> </div>	
<div>DESCRIPTION:</div> <div> <p>Interior, 1st Floor, Ceiling Area (typical) above A & C Wing Boys and Girls Toilets</p> <p>Pipe Elbows confirmed to be ACM (As per 2019 AHERA)</p> </div>	

 500 Summit Lake Drive, Suite 450 Valhalla, NY 10595		<h1>PHOTOGRAPHIC DOCUMENTATION</h1>	
Client: Briarcliff Manor Union Free School District	Project Name: Final Report of Environmental Services for Phase 1, 2 & 3 Project at Briarcliff Middle/High School		WSP Project No.: 31403475.004


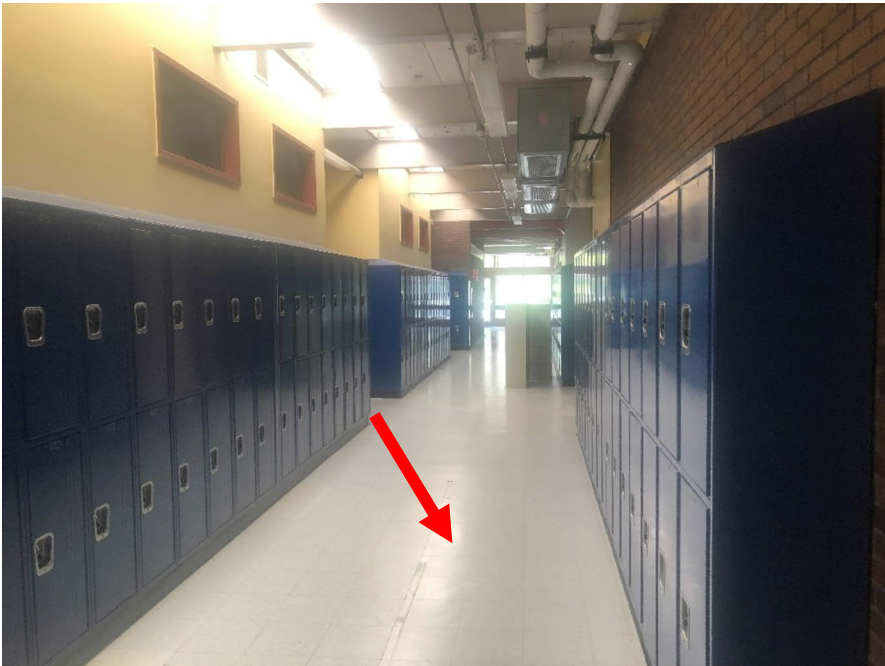



PHOTO No.: <div>5</div>	
DESCRIPTION: Interior, HS Stairs (typical) 12"x12" Floor Tile and associated mastic confirmed to be ACM (As per 2019 AHERA)	

PHOTO No.: <div>6</div>	
DESCRIPTION: Interior, 1 st Floor, A/C Wing Hallway Locker Area (typical) 12"x12" Floor Tile and associated mastic confirmed to be ACM (As per 2019 AHERA)	

 <div> 500 Summit Lake Drive, Suite 450 Valhalla, NY 10595 </div>	<h1>PHOTOGRAPHIC DOCUMENTATION</h1>	
Client: Briarcliff Manor Union Free School District	Project Name: Final Report of Environmental Services for Phase 1, 2 & 3 Project at Briarcliff Middle/High School	WSP Project No.: 31403475.004

<div> <div>PHOTO No.:</div> <div>7</div> </div>		<div>DESCRIPTION:</div> <p>Interior, 1st Floor, Maresca Center</p> <p>12"x12" Floor Tile and associated mastic confirmed to be ACM (As per 2019 AHERA) and Joint Compound (tan) confirmed to be ACM</p>
-------------------------------------------------	-------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<div> <div>PHOTO No.:</div> <div>8</div> </div>		<div>DESCRIPTION:</div> <p>Interior, 1st Floor, Room 103</p> <p>Purple paint to wood wall confirmed to be lead-based paint LBP.</p>
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**APPENDIX J:
FILE SEARCH**



565 Taxter Road, Suite 510
Elmsford, New York 10523

HOMOGENEOUS AREA SHEET

Client: Briarcliff Manor UFSD

Project Site: Todd Elementary School

Page 1 of 1

Inspector(s): Drew Cheskin

Management Planner(s): Drew Cheskin

Project #: 2042839.044

HA #	Homogenous Area Description	Material Type	ACM	Friable
01	12"x12" White VAT w/ Gray Marble and Mastic	M	YES	NO
02	12"x12" White VAT w/ Gray Specks and Mastic	M	YES	NO
03	Mastic to 12"x12" Light Blue w/ Dark Blue VAT	M	YES	NO
04	Mastic to 12"x12" Light Salmon w/ Dark Salmon VAT	M	YES	NO
05	Sheetrock (Joint Compound Only)	M	YES	YES
06	Mudded Joint Packing	M	YES	YES
07	Transite Table Top Beneath Hood	M	YES	YES
08	Pipe Elbows	M	YES	YES
09	Ceiling Plaster, Brown Coat (Girls Locker Room Shower)	S	NO	YES
10	Ceiling Plaster, White Coat (Girls Locker Room Shower)	S	YES	YES
11	Mastic to 12"x12" Floor Tile, Black (Hall outside Loading Dock)	M	NO	NO
12	12"x12" Floor Tiles, White (Hall outside Loading Dock)	M	NO	NO
13	Mastic to 4" Cove Base, Yellow (Hall outside Loading Dock)	M	NO	NO
14	Drywall, White (Hall outside Loading Dock)	M	NO	YES
15	Drywall, Gray (Custodians Office & Restroom)	M	NO	YES
16	Mastic assoc. with Cork Board, Brown (Custodians Office)	M	NO	NO
17	Cork Board, Brown (Custodians Office)	M	NO	YES

TSI = Thermal System Insulation

S = Surfacing

M = Miscellaneous

SUMMARY OF SPACE



2019 AHERA 3 YEAR RE-INSPECTION REPORT MANAGEMENT PLAN UPDATE

**BRIARCLIFF MANOR UNION FREE SCHOOL DISTRICT
BRIARCLIFF MANOR HIGH SCHOOL
444 PLEASANTVILE ROAD, BRIARCLIFF MANOR, NY 10510**

Space ID	Description / Common Name	HA	HA Description	Quantity	Assesment	Response Action			Comment
						Remove	Repair	O&M	
1004	High School Custodians Office	2	12"x12" Floor Tile and Associated Mastic	64 SF	X	-	-	64 SF	White w/ Gray Marble
1006	Hallway at Kitchen	2	12"x12" Floor Tile and Associated Mastic	1200 SF	X	-	-	1200 SF	White w/ Gray Marble
1011	High School Kitchen Storage	2	12"x12" Floor Tile and Associated Mastic	250 SF	X	-	-	250 SF	White w/ Gray Marble
1014	Kitchen Office	2	12"x12" Floor Tile and Associated Mastic	56 SF	X	-	-	56 SF	White w/ Gray Marble
1021	C-Wing Halls	2	12"x12" Floor Tile and Associated Mastic	5,950 SF	X	-	-	5950 SF	White w/ Gray Specks
1022	Counselor	2	12"x12" Floor Tile and Associated Mastic	300 SF	X	-	-	300 SF	White w/ Gray Specks
1023	Music Storage	2	12"x12" Floor Tile and Associated Mastic	300 SF	X	-	-	300 SF	White w/ Gray Specks (Under Carpet)
1040	Corridor Rear @ HS Library	2	12"x12" Floor Tile and Associated Mastic	10,982 SF	X	-	-	10,982 SF	White w/ Gray Marble
1049	Room 113	2	12"x12" Floor Tile and Associated Mastic	540 SF	X	-	-	540 SF	White w/ Gray Marble
1050	Room 112	2	12"x12" Floor Tile and Associated Mastic	600 SF	X	-	-	600 SF	White w/ Gray Marble
1051	Stairs	2	12"x12" Floor Tile and Associated Mastic	120 SF	X	-	-	120 SF	White w/ Gray Marble
1066	Custodial Closet	1	Pipe Elbow	10 LF	7	-	-	10 LF	
1067	Stairs	2	12"x12" Floor Tile and Associated Mastic	120 SF	X	-	-	120 SF	White w/ Gray Marble
1072	Nurse's Office	2	12"x12" Floor Tile and Associated Mastic	380 SF	X	-	-	380 SF	White w/ Gray Marble
1073	Nurse's Closet	2	12"x12" Floor Tile and Associated Mastic	80 SF	X	-	-	80 SF	White w/ Gray Marble

SUMMARY OF SPACE



2019 AHERA 3 YEAR RE-INSPECTION REPORT MANAGEMENT PLAN UPDATE

**BRIARCLIFF MANOR UNION FREE SCHOOL DISTRICT
BRIARCLIFF MANOR HIGH SCHOOL
444 PLEASANTVILE ROAD, BRIARCLIFF MANOR, NY 10510**

Space ID	Description / Common Name	HA	HA Description	Quantity	Assesment	Response Action			Comment
						Remove	Repair	O&M	
1074	Closet	2	12"x12" Floor Tile and Associated Mastic	96 SF	X	-	-	96 SF	White w/ Gray Marble
1077	Stairs	2	12"x12" Floor Tile and Associated Mastic	120 SF	X	-	-	120 SF	White w/ Gray Marble
1080	Hallway	2	12"x12" Floor Tile and Associated Mastic	2,832 SF	X	-	-	2,832 SF	White w/ Gray Marble
1081	Room 145	2	12"x12" Floor Tile and Associated Mastic	650 SF	X	-	-	650 SF	White w/ Gray Marble (Under Carpet)
1082	Room 144	1	Pipe Elbow	9 LF	7	-	-	9 LF	
1082	Room 144	2	12"x12" Floor Tile and Associated Mastic	100 SF	X	-	-	100 SF	White w/ Gray Marble
1083	Room 143	2	12"x12" Floor Tile and Associated Mastic	100 SF	X	-	-	100 SF	White w/ Gray Marble
1084	Room 142	1	Pipe Elbow	10 LF	7	-	-	10 LF	
1084	Room 142	2	12"x12" Floor Tile and Associated Mastic	100 SF	X	-	-	100 SF	White w/ Gray Marble
1085	Room 141	2	12"x12" Floor Tile and Associated Mastic	150 SF	X	-	-	150 SF	White w/ Gray Marble
1086	Room 140	2	12"x12" Floor Tile and Associated Mastic	130 SF	X	-	-	130 SF	White w/ Gray Marble
1087	Room 153	2	12"x12" Floor Tile and Associated Mastic	150 SF	X	-	-	150 SF	White w/ Gray Marble (Under Carpet)
1088	Room 152	2	12"x12" Floor Tile and Associated Mastic	192 SF	X	-	-	192 SF	White w/ Gray Marble
1089	Room 151	2	12"x12" Floor Tile and Associated Mastic	96 SF	X	-	-	96 SF	White w/ Gray Marble (Under Carpet)
1090	Room 150	1	Pipe Elbow	12 LF	7	-	-	12 LF	
1090	Room 150	2	12"x12" Floor Tile and Associated Mastic	96 SF	X	-	-	96 SF	White w/ Gray Marble

SUMMARY OF SPACE



2019 AHERA 3 YEAR RE-INSPECTION REPORT MANAGEMENT PLAN UPDATE

**BRIARCLIFF MANOR UNION FREE SCHOOL DISTRICT
BRIARCLIFF MANOR HIGH SCHOOL
444 PLEASANTVILE ROAD, BRIARCLIFF MANOR, NY 10510**

Space ID	Description / Common Name	HA	HA Description	Quantity	Assesment	Response Action			Comment
						Remove	Repair	O&M	
1091	Room 149	2	12"x12" Floor Tile and Associated Mastic	84 SF	X	-	-	84 SF	White w/ Gray Marble
1092	Room 148	2	12"x12" Floor Tile and Associated Mastic	192 SF	X	-	-	192 SF	White w/ Gray Marble
1093	Room 147	2	12"x12" Floor Tile and Associated Mastic	140 SF	X	-	-	140 SF	White w/ Gray Marble
1094	Room 146	2	12"x12" Floor Tile and Associated Mastic	140 SF	X	-	-	140 SF	White w/ Gray Marble (Under Carpet)
1095	Maresca Center	2	12"x12" Floor Tile and Associated Mastic	1,800 SF	X	-	-	1,800 SF	White w/ Gray Marble
1104	A-Wing Hallway	2	12"x12" Floor Tile and Associated Mastic	6,200 SF	X	-	-	6,200 SF	White w/ Gray Specks
1106	Security Office	2	12"x12" Floor Tile and Associated Mastic	600 SF	X	-	-	600 SF	White w/ Gray Marble (Under Carpet)
1107	Copy Room	2	12"x12" Floor Tile and Associated Mastic	200 SF	X	-	-	200 SF	White w/ Gray Specks
1109	Equipment Managers Office	1	Pipe Elbow	12 LF	7	-	-	12 LF	
1109		2	12"x12" Floor Tile and Associated Mastic	110SF	X	-	-	110SF	White w/ Gray Marble
1110	Boy's Locker Vestible	2	12"x12" Floor Tile and Associated Mastic	30 SF	X	-	-	30 SF	White w/ Gray Marble
1113	Trainer's Room (In Gym)	2	12"x12" Floor Tile and Associated Mastic	150 SF	X	-	-	150 SF	White w/ Gray Marble
1114	Athletic Director's Office	1	Pipe Elbow	4 LF	7	-	-	4 LF	Above Ceiling
1116	Storage (In Gym)	1	Pipe Elbow	20 LF	7	-	-	20 LF	
1118	Girl's Locker Vestible	2	12"x12" Floor Tile and Associated Mastic	30 SF	X	-	-	30 SF	White w/ Gray Marble
1126	Storage	1	Pipe Elbow	50 LF	7	-	-	50 LF	

SUMMARY OF SPACE



2019 AHERA 3 YEAR RE-INSPECTION REPORT MANAGEMENT PLAN UPDATE

**BRIARCLIFF MANOR UNION FREE SCHOOL DISTRICT
BRIARCLIFF MANOR HIGH SCHOOL
444 PLEASANTVILE ROAD, BRIARCLIFF MANOR, NY 10510**

Space ID	Description / Common Name	HA	HA Description	Quantity	Assesment	Response Action			Comment
						Remove	Repair	O&M	
1128	Storage	2	12"x12" Floor Tile and Associated Mastic	100 SF	X	-	-	100 SF	White w/ Gray Marble
2011	Stairs	2	12"x12" Floor Tile and Associated Mastic	110 SF	X	-	-	110 SF	White w/ Gray Marble
2022	Stairs	2	12"x12" Floor Tile and Associated Mastic	110SF	X	-	-	110SF	White w/ Gray Marble
2023	Room 218	2	12"x12" Floor Tile and Associated Mastic	420 SF	X	-	-	420 SF	White w/ Gray Marble
2025	Room 217	2	12"x12" Floor Tile and Associated Mastic	840 SF	X	-	-	840 SF	White w/ Gray Specks
2027	Room 216	2	12"x12" Floor Tile and Associated Mastic	420 SF	X	-	-	420 SF	White w/ Gray Specks
2028	Room 215	2	12"x12" Floor Tile and Associated Mastic	840 SF	X	-	-	840 SF	White w/ Gray Specks
2029	Room 214	2	12"x12" Floor Tile and Associated Mastic	1,216 SF	X	-	-	1,216 SF	White w/ Gray Specks
2030	Room 212	2	12"x12" Floor Tile and Associated Mastic	110 SF	X	-	-	110 SF	White w/ Gray Specks
2031	Book Storage	2	12"x12" Floor Tile and Associated Mastic	176 SF	X	-	-	176 SF	White w/ Gray Specks
2032	Hallway	2	12"x12" Floor Tile and Associated Mastic	512 SF	X	-	-	512 SF	White w/ Gray Specks
2033	Room 210	2	12"x12" Floor Tile and Associated Mastic	784 SF	X	-	-	784 SF	White w/ Gray Specks
2034	Room 208	2	12"x12" Floor Tile and Associated Mastic	784 SF	X	-	-	784 SF	White w/ Gray Specks
2035	Room 207	2	12"x12" Floor Tile and Associated Mastic	176 SF	X	-	-	176 SF	White w/ Gray Specks
2036	Room 206	2	12"x12" Floor Tile and Associated Mastic	784 SF	X	-	-	784 SF	White w/ Gray Specks

SUMMARY OF SPACE



2019 AHERA 3 YEAR RE-INSPECTION REPORT MANAGEMENT PLAN UPDATE

**BRIARCLIFF MANOR UNION FREE SCHOOL DISTRICT
BRIARCLIFF MANOR HIGH SCHOOL
444 PLEASANTVILE ROAD, BRIARCLIFF MANOR, NY 10510**

Space ID	Description / Common Name	HA	HA Description	Quantity	Assesment	Response Action			Comment
						Remove	Repair	O&M	
2037	Room 204	2	12"x12" Floor Tile and Associated Mastic	896 SF	X	-	-	896 SF	White w/ Gray Specks
2038	Room 200	3	Sheetrock and Associated Joint Compound	628 SF	7	-	-	628 SF	
2038	Room 200	2	12"x12" Floor Tile and Associated Mastic	448 SF	X	-	-	448 SF	White w/ Gray Specks
2040	Room 203	2	12"x12" Floor Tile and Associated Mastic	784 SF	X	-	-	784 SF	White w/ Gray Specks
2041	Room 201	2	12"x12" Floor Tile and Associated Mastic	784 SF	X	-	-	784 SF	White w/ Gray Specks
2042	Hallway	2	12"x12" Floor Tile and Associated Mastic	416 SF	X	-	-	416 SF	White w/ Gray Specks
2043	Room 242	2	12"x12" Floor Tile and Associated Mastic	104 SF	X	-	-	104 SF	White w/ Gray Specks
2047	Hallway	2	12"x12" Floor Tile and Associated Mastic	712 SF	X	-	-	712 SF	White w/ Gray Specks
2054	Stairs	2	12"x12" Floor Tile and Associated Mastic	110 SF	X	-	-	110 SF	White w/ Gray Specks
2059	Stairs	2	12"x12" Floor Tile and Associated Mastic	110 SF	X	-	-	110 SF	White w/ Gray Specks

ASSESSMENT CATEGORIES

- 1. = Damaged or Significantly Damaged TSI ACBM
- 2. = Damaged Friable Surfacing ACBM
- 3. = Significantly Damaged Friable Surfacing ACBM
- 4. = Damaged or Significantly Damaged Friable Miscellaneous ACBM
- 5. = ACBM with Potential for Damage
- 6. = ACBM with Potential for Significant Damage
- 7. = Any Remaining Friable ACBM or Friable Suspect ACBM
- X. = Not Applicable (Material is Nonfriable Surfacing or Miscellaneous Material)

September 23, 2021

The following roof system has been reviewed and approved as a warrantable system under the Johns Manville Peak Advantage Guarantee Program. A guarantee will be issued to the contractor in accordance with all procedures and requirements of the Johns Manville Peak Advantage Guarantee Program.

PROJECT INFORMATION

Project Number:	8059575 <i>**Reference number when corresponding with Johns Manville**</i>
Project Name:	Briarcliff Manor UFSD - HS/MS
Guarantee Term:	20 Year No Dollar Limit
Project Location:	Briarcliff Manor UFSD - HS/MS 444 Pleasantville Rd Briarcliff Manor, NY 10510

RIDERS

Please reference SDR # JFRED09232021T when applying for your Johns Manville Guarantee

Wind (mph)	Hail (inches)	Accidental Puncture (repair hours)	Ponding	Overburden	Lightweight Concrete
<input checked="" type="checkbox"/> 120	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ROOF ASSEMBLY AS PROPOSED TO JOHNS MANVILLE

Roof Area Name: Concrete Deck Areas
System & Spec: TPO – ST6RA

Deck Information

Deck Type & Thickness:	Concrete Deck; 6 inch
Deck Slope (inch / foot):	0
Materials Left in Place:	

Insulation Layer 1

Insulation:	ENRGY 3, 3.7 inch (4x4 boards)	
Attachment:	Ribbon Adhered	JM Two-Part Urethane Insulation Adhesive (UIA)
Attachment Pattern:	Field (Zone 1): 12 in oc Perimeter (Zone 2): 4 in oc Corner (Zone 3): 4 in oc	Bead Spacing using 3/4 inch bead

Insulation Layer 2

Insulation:	Tapered ENRGY 3 (4x4 boards) 1/8 in per ft slope	
Attachment:	Ribbon Adhered	JM Two-Part Urethane Insulation Adhesive (UIA)
Attachment Pattern:	Field (Zone 1): 12 in oc Perimeter (Zone 2): 4 in oc Corner (Zone 3): 4 in oc	Bead Spacing using 3/4 inch bead

Cover Board

Cover Board:	ProtectoR HD, 0.5 inch (4x4 boards)	
Attachment:	Ribbon Adhered	JM Two-Part Urethane Insulation Adhesive (UIA)
Attachment Pattern:	Field (Zone 1): 12 in oc Perimeter (Zone 2): 4 in oc Corner (Zone 3): 4 in oc	Bead Spacing using 3/4 inch bead

Membrane

Membrane:	JM TPO 60	
Attachment:	Adhered	JM All Season Sprayable Bonding Adhesive

Flashings

Flashing Materials:	JM TPO 60 adhered using JM All Season Sprayable Bonding Adhesive	
---------------------	------------------------------------------------------------------	--

Accessories

Edge Metal:	Presto-Tite Fascia System (Single Ply Systems) or PrestoLock Gold Coping	
-------------	--------------------------------------------------------------------------	--

Roof Area Name: **Acoustical Metal Deck Areas****System & Spec:** **TPO – ST6RA****Deck Information**

Deck Type & Thickness:	Steel Deck; 22 gauge	
Deck Slope (inch / foot):	0	
Materials Left in Place:		

Insulation Layer 1

Insulation:	ENRGY 3, 3.7 inch (4x8 boards)	
Attachment:	Fastened	UltraFast Fasteners & UltraFast Plates
Attachment Pattern:	Field (Zone 1): 8 Perimeter (Zone 2): 24 Corner (Zone 3): 32	Fasteners & Plates per board

Insulation Layer 2

Insulation:	Tapered ENRGY 3 (4x4 boards) 1/8 in per ft slope	
Attachment:	Ribbon Adhered	JM Two-Part Urethane Insulation Adhesive (UIA)

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Attachment Pattern:	Field (Zone 1): 12 in oc Perimeter (Zone 2): 4 in oc Corner (Zone 3): 4 in oc	Bead Spacing using 3/4 inch bead
---------------------	----------------------------------------------------------------------------------------------------------	----------------------------------

Cover Board

Cover Board:	ProtectoR HD, 0.5 inch (4x4 boards)	
Attachment:	Ribbon Adhered	JM Two-Part Urethane Insulation Adhesive (UIA)

Attachment Pattern:	Field (Zone 1): 12 in oc Perimeter (Zone 2): 4 in oc Corner (Zone 3): 4 in oc	Bead Spacing using 3/4 inch bead
---------------------	----------------------------------------------------------------------------------------------------------	----------------------------------

Membrane

Membrane:	JM TPO 60	
Attachment:	Adhered	JM All Season Sprayable Bonding Adhesive

Flashings

Flashing Materials:	JM TPO 60 adhered using JM All Season Sprayable Bonding Adhesive	
---------------------	------------------------------------------------------------------	--

Accessories

Edge Metal:	Presto-Tite Fascia System (Single Ply Systems) or PrestoLock Gold Coping	
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Roof Area Name: **Metal Deck Areas**
System & Spec: **TPO – ST6RA**

Deck Information

Deck Type & Thickness:	Steel Deck; 22 gauge	
Deck Slope (inch / foot):	0	
Materials Left in Place:		

Insulation Layer 1

Insulation:	ENRGY 3, 3.7 inch (4x8 boards)	
Attachment:	Fastened	UltraFast Fasteners & UltraFast Plates

Attachment Pattern:	Field (Zone 1): 8 Perimeter (Zone 2): 24 Corner (Zone 3): 32	Fasteners & Plates per board
---------------------	-----------------------------------------------------------------------------------------	------------------------------

Insulation Layer 2

Insulation:	Tapered ENRGY 3 (4x4 boards) 1/8 in per ft slope	
Attachment:	Ribbon Adhered	JM Two-Part Urethane Insulation Adhesive (UIA)

Attachment Pattern:	Field (Zone 1): 12 in oc Perimeter (Zone 2): 4 in oc	Bead Spacing using 3/4 inch bead
---------------------	-----------------------------------------------------------------------	----------------------------------

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	Corner (Zone 3): 4 in oc	
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Cover Board

Cover Board:	ProtectoR HD, 0.5 inch (4x4 boards)	
Attachment:	Ribbon Adhered	JM Two-Part Urethane Insulation Adhesive (UIA)
Attachment Pattern:	Field (Zone 1): 12 in oc Perimeter (Zone 2): 4 in oc Corner (Zone 3): 4 in oc	Bead Spacing using 3/4 inch bead

Membrane

Membrane:	JM TPO 60	
Attachment:	Adhered	JM All Season Sprayable Bonding Adhesive

Flashings

Flashing Materials:	JM TPO 60 adhered using JM All Season Sprayable Bonding Adhesive	
---------------------	------------------------------------------------------------------	--

Accessories

Edge Metal:	Presto-Tite Fascia System (Single Ply Systems) or PrestoLock Gold Coping	
-------------	--------------------------------------------------------------------------	--

DESIGN CRITERIA & INFORMATION

Perimeter and Corner Dimensions

Perimeter and corner dimensions for buildings less than 60 ft. in height:

Equal to the smaller of:

- 0.1 times the building lesser plan dimension (overall length or width)
- 0.4 times the eave height

but will never measure less than 0.04 times the building lesser plan dimension and never less than 3 ft.

Perimeter and corner dimensions for buildings greater than 60 ft. in height:

Equal to 0.1 times the building lesser plan dimension (overall length or width), but never less than 3 ft.

Corners are "L" shaped with legs twice the width of the perimeter.

Buildings with continuous parapets 36" or greater may treat corners as perimeters.

Ensure any whole or partial insulation board that falls within the calculated perimeter or corner has the increased securement applied over the entire board. This must also be true for any roof cover/base sheet width when the roll is parallel to the building edge.

Installation Notes

- For additional installation guidelines and considerations, please visit <https://www.jm.com/en/commercial-roofing/specs-and-details/>
- Listed below are recommendations for installation of products **only if included** in the proposed roof assembly

Attachment Method or Product	Recommendation
Materials Left In Place	<ul style="list-style-type: none"> • Moisture scan is required • All wet/damaged materials must be completely removed and replaced.

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	<ul style="list-style-type: none"> All flashing must be removed, all drains cut out, and new sumps installed.
Asphalt	Installed in full coverage hot asphalt
MBR Cold Application Adhesive	Wait 28 days to allow adhesive to cure
Roofing Systems Urethane Adhesive (RSUA)	Install with ¾ inch bead
JM 2 Part Urethane Insulation Adhesive (UIA)	Install with ¾ inch bead
JM All Season Sprayable Adhesive	Fan Pattern shall use 50% overlap
JM 2 Part Urethane Insulation Adhesive (UIA) Canister	Spatter Pattern shall use 80% coverage
UltraFast Fastener Plates – Square Flat	<ul style="list-style-type: none"> May be used with all Insulation and Cover Boards Recommended installation with high compressive strength boards (>80 PSI) Use with Structural Concrete Deck Fasteners
UltraFast Fastener Plates – Recessed Round	Installation of insulation boards or cover boards with lower compressive strength
Polymer Auger Fastener Plates – Cover Boards	Install with 3-inch plates
Polymer Auger Fastener Plate – Membrane	Install with 2-inch plates
Overburden	Owner responsible for removal and reinstallation of any/all overburn products should a roof leak occur and require repair.

The system(s) shall be eligible for a Johns Manville Peak Advantage Roofing System Guarantee when installed by a certified Johns Manville contractor and inspected and approved by a Johns Manville Technical Representative. All materials supplied or marketed by Johns Manville will be covered under the terms and conditions of this agreement.

Thank you for your interest in our roofing products and services. Please contact Johns Manville if any information is incomplete or incorrect so that appropriate modifications can be made.

Johns Manville Technical Services
Roofing Systems Group
10100 W Ute Ave
Littleton, CO 80127
800-922-5922 Option 3

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FINAL REPORT OF ENVIRONMENTAL SERVICES

Performed at:

**TODD ELEMENTARY SCHOOL
45 INGHAM ROAD
BRIARCLIFF MANOR, NY 10510**

Prepared for:



**Briarcliff Manor Union Free School District
45 Ingham Road
Briarcliff Manor, NY 10510**

Prepared by:



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

**Project No. 31403475.005
Final Submission Date: September 21, 2021**



September 21, 2021

Mr. Anthony Bauso
Assistant Director of Facilities Operations & Maintenance
Briarcliff Manor Union Free School District
45 Ingham Road
Briarcliff Manor, NY 10510

**Subject: Final Report of Environmental Services
Todd Elementary School
45 Ingham Road
Briarcliff Manor, NY 10510**

Dear Mr. Bauso:

WSP USA Solutions, Inc. has completed a material inspection at the Todd Elementary School located at 45 Ingham Road, Briarcliff Manor, NY 10510. 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 BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Todd 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.

A handwritten signature in blue ink, appearing to read 'CN', is positioned above the printed name of the signatory.

Craig Napolitano, CHMM
Vice President, Emergency Management & IH Services



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Appendices

Appendix A: Asbestos Sample Analysis Results in Tabular Form

Appendix B: Asbestos Bulk Sample Field Data Sheets with Chain of Custody & Laboratory Results

Appendix C: Asbestos Bulk Sample Location Drawings

Appendix D: Asbestos Containing Materials Location Drawings

Appendix E: Lead XRF Shot Results

Appendix F: PCB Bulk Sample Field Data Sheets with Chain of Custody & Laboratory Results

Appendix G: Company License, Personnel Certifications and Laboratory Accreditations

Appendix H: Scope of Work Drawings

Appendix I: Photographic Documentation

Appendix J: File Search



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 Todd Elementary School located at 45 Ingham Road, Briarcliff Manor, NY 10510. The intent of this inspection was to screen for ACM, LBP and PCBs that may be impacted during the BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Todd Elementary School.

Stephen Gruber and Nicholas Casale of WSP performed this inspection on August 17, 19 and 27, 2021. Mr. Gruber is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert# 17-42557) and is licensed New York State EPA as a Lead Inspector (Cert# LBP-I-1219874-1). Mr. Casale is licensed as a New York State Department of Labor (NYSDOL) Asbestos Inspector (Cert# 17-25789) and is licensed New York State EPA as a Lead Inspector (LBP-I-1207478-1)

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 BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Todd Elementary School:

A. ASBESTOS-CONTAINING MATERIAL

Analytical results of the bulk samples collected on 08/17/21, 08/19/2021 and 08/27/2021 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **Tar at Foundation Wall**
- **Beige Door Frame Caulking**
- **Expansion Join Caulking (Gray) at wall**
- **Gray Door Frame Caulking**
- **Cementitious Windowsill (White)**
- **Sealant (beige) at brick expansion join**

The following materials **contain asbestos as per 2019 AHERA Report**

- **9"x9" White VAT w/Black Specks and Mastic (Not Affected by SOW)**
- **9"x9" Blue VAT w/White Specks and Mastic (Not Affected by SOW)**
- **9"x9" Tan VAT w/Black Marbled and Mastic (Not Affected by SOW)**
- **9"x9" Orange-Born VAT and Mastic (Not Affected by SOW)**
- **9"x9" Gray VAT w/Beige Specks and Mastic (Not Affected by SOW)**
- **9"x9" White VAT w/Brown Specks and Mastic (Not Affected by SOW)**
- **9"x9" Black VAT w/White Spots and Mastic (Not Affected by SOW)**
- **9"x9" Black VAT w/White Marbled and Mastic (Not Affected by SOW)**
- **Pipe Elbows (Not Affected by SOW)**
- **Pipe Insulation (Not Affected by SOW)**



Final Report for Environmental Inspection Services

Analytical results of the bulk samples collected on 08/17/21, 08/19/2021 and 08/27/2021 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Gypsum (White) under EPDM Roofing
- Perlite Insulation (tan)
- Fiberboard (brown) under EPDM
- Vent Sealant (Gray)
- Pitch Pocket Sealant (Gray)
- Pitch Pocket Sealant (Black)
- Gray Caulking at Metal Cap Flashing
- Sink Undercoating (Gray)
- Brown Mastic associated w. cove base (2nd Layer)
- Crème adhesive associated w. cove base (1st Layer)
- Blue Cove Base
- 12"x12" White VFT w. Blue Spots
- White Floor Levelling Compound w. Yellow Adhesive
- Acoustical Ceiling Plaster (Gray)
- Ceiling Plaster Patches (White)
- Black Glue dots on wall
- Sealant (White) at pipe edges
- Cementitious Ceiling (Gray)
- Yellow mastic assoc. w. Carpet Flooring
- Mortar assoc. w. ceramic floor tiles
- Backing associated w. ceramic wall tiles
- White textured paint
- Mortar at Cinder Block
- Window Caulking (White)
- Expansion Joint Caulking Brown (At Wall)
- Window Frame Caulking (Gray)
- Stone Sill Caulking (Crème)
- Fiberboard at Floor (Black)
- 2'x4' Suspended Ceiling Tiles
- Cementitious Windowsill (Black)
- Black mastic assoc. w. 12"x12" White VFT w. Brown Spots
- 12"x12" White VFT w. Brown Spots
- Joint compound (white) assoc. w. Gypsum Board
- Gypsum Board (White)
- Backing (grayish/white) assoc. w. ceramic wall tiles
- Grout (white) assoc. w. ceramic wall tiles
- 12"x12" Gray w. Spots Vinyl Floor Tiles
- Black Mastic assoc. w. 12"x12" Gray w. Spots Vinyl Floor Tiles
- Black Cove Base (6")
- Gray mastic associated w. black cove base (6")
- Wall Plaster (Brown Coat)



Final Report for Environmental Inspection Services

- Wall Plaster (White Coat)
- Ceiling Plaster (Brown Coat)
- Ceiling Plaster (White Coat)
- Mortar (gray) at ceramic floor tiles
- Backing (gray) assoc. w. ceramic wall tiles
- Grout (white) assoc. w. ceramic wall tiles
- Gypsum Board (Brown)
- Joint Compound assoc. w. Gypsum Board (white)
- Brick Mortar (gray)
- Louver Caulking (Gray)

Analytical results of bulk samples **previously collected** by Berger indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Glue Dots, Brown
- Gypsum Board, Gray
- Wall Plaster, Brown Coat
- Wall Plaster, White Coat
- Ceiling Insulation, White
- Ceiling Insulation, Brown
- Ceiling Plaster, Brown Coat
- Ceiling Plaster, White Coat
- Glue dots assoc. w. peg board brown
- Pegboard

B. LEAD-BASED PAINT

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

- **White Paint on Metal I-Beam**
- **White Paint on Metal Ceiling**
- **Tan Paint on Metal Ceiling**
- **Tan Paint on Metal I-Beam**
- **White Paint on Wood Door Frame**
- **White Paint on Wood Awning**

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

- Red Paint on Metal Exterior Door Frame
- Varnish Paint on Wood Door
- Gray Paint on Metal Door Frame
- White Paint on Concrete Wall
- White Paint on Cinderblock Wall



Final Report for Environmental Inspection Services

- Red Paint on Metal Radiator Cover
- White Paint on Vinyl Electric Conduit
- White Paint on Metal Electric Conduit
- White Paint on Metal Radiator Cover
- White Paint on Wood Shelves
- Tan Paint on Gypsum Wall
- White Paint on Metal Window Frame
- White Paint on Metal Radiator Cover
- Tan Paint on Metal Column
- Yellow Paint on Gypsum Wall
- Red Paint on Metal Handrail
- Red Paint on Metal Door
- Yellow Paint on Cinder Block Wall
- White Paint on Plaster Wall
- Red Paint on Wood Wall Trim
- Red Paint on Wood Door Frame
- Red Paint on Wood Door
- Yellow Paint on Plaster Wall
- Red Paint on Wood Window Frame
- Beige Paint on Metal Door Frame
- Blue Paint on Metal Door
- Varnish Paint on Wood Window Frame
- Blue Paint on Vinyl Baseboard
- Yellow Paint on Metal Radiator Cover
- Black Paint on Vinyl Baseboard
- Yellow Paint on Corkboard
- Yellow Paint on Glass Window
- Yellow Paint on Wood Window Frame
- Yellow Paint on Concrete Wall
- Red Paint on Metal Column
- White Paint on Wood Door Frame
- Tan Paint on Cinder Block Wall
- White Paint on Cinderblock Wall
- Yellow Paint on Brick Wall
- Blue Paint on Metal Door Frame
- Blue Paint on Cinder Block Wall
- Blue Paint on Metal Radiator Cover
- Red Paint on Metal Door
- Red Paint on Metal Door Frame
- Blue Paint on Metal Door Frame
- Black Paint on Metal Stairs
- Red Paint on Concrete Floor

C. PCB-CONTAINING MATERIAL



Final Report for Environmental Inspection Services

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):

- Gray Caulking at Metal Cap Flashing
- Brown Expansion Joint Caulking
- Gray Expansion Joint Caulking
- Beige Door Frame Caulking
- White Window Caulking
- Gray Window Frame Caulking
- Crème Stone Joint Caulking
- Gray Door Frame Caulking
- Gray Louver Frame Caulking



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 than 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 is 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 Analyzer. 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 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 BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Todd Elementary School. Locations surveyed include:

- Roofs (Limited Survey of designated roof areas as per BBS personnel)
- Exterior – Façade
- Interior – Various Locations

A. ASBESTOS-CONTAINING MATERIAL

Materials examined during the WSP this inspection included:

- Gypsum (White) under EPDM Roofing
- Perlite Insulation (tan)
- Fiberboard (brown) under EPDM
- Vent Sealant (Gray)
- Pitch Pocket Sealant (Gray)
- Pitch Pocket Sealant (Black)
- Gray Caulking at Metal Cap Flashing
- Sink Undercoating (Gray)
- Brown Mastic associated w. cove base (2nd Layer)
- Crème adhesive associated w. cove base (1st Layer)
- Blue Cove Base
- 12"x12" White VFT w. Blue Spots
- White Floor Levelling Compound w. Yellow Adhesive
- Acoustical Ceiling Plaster (Gray)
- Ceiling Plaster Patches (White)
- Black Glue dots on wall
- Sealant (White) at pipe edges
- Cementitious Ceiling (Gray)
- Yellow mastic assoc. w. Carpet Flooring
- Mortar assoc. w. ceramic floor tiles
- Backing associated w. ceramic wall tiles
- White textured paint
- Mortar at Cinder Block
- Window Caulking (White)
- Expansion Joint Caulking Brown (At Wall)
- Tar at Foundation Wall
- Beige Door Frame Caulking
- Expansion Join Caulking (Gray) at wall
- Window Frame Caulking (Gray)
- Stone Sill Caulking (Crème)



- Gray Door Frame Caulking
- Fiberboard at Floor (Black)
- 2'x4' Suspended Ceiling Tiles
- Cementitious Windowsill (Black)
- Cementitious Windowsill (White)
- Black mastic assoc. w. 12"x12" White VFT w. Brown Spots
- 12"x12" White VFT w. Brown Spots
- Sealant (beige) at brick expansion join
- Joint compound (white) assoc. w. Gypsum Board
- Gypsum Board (White)
- Backing (grayish/white) assoc. w. ceramic wall tiles
- Grout (white) assoc. w. ceramic wall tiles
- 12"x12" Gray w. Spots Vinyl Floor Tiles
- Black Mastic assoc. w. 12"x12" Gray w. Spots Vinyl Floor Tiles
- Black Cove Base (6")
- Gray mastic associated w. black cove base (6")
- Wall Plaster (Brown Coat)
- Wall Plaster (White Coat)
- Ceiling Plaster (Brown Coat)
- Ceiling Plaster (White Coat)
- Mortar (gray) at ceramic floor tiles
- Backing (gray) assoc. w. ceramic wall tiles
- Grout (white) assoc. w. ceramic wall tiles
- Gypsum Board (Brown)
- Joint Compound assoc. w. Gypsum Board (white)
- Brick Mortar (gray)
- Louver Caulking (Gray)

Analytical results of the bulk samples collected on 08/17/21, 08/19/2021 and 08/27/2021 by WSP indicate that the following materials **contain asbestos** (greater than 1-percent).

- **Tar at Foundation Wall**
- **Beige Door Frame Caulking**
- **Expansion Join Caulking (Gray) at wall**
- **Gray Door Frame Caulking**
- **Cementitious Windowsill (White)**
- **Sealant (beige) at brick expansion join**

The following materials **contain asbestos as per 2019 AHERA Report**

- **9"x9" White VAT w/Black Specks and Mastic (Not Affected by SOW)**
- **9"x9" Blue VAT w/White Specks and Mastic (Not Affected by SOW)**
- **9"x9" Tan VAT w/Black Marbled and Mastic (Not Affected by SOW)**
- **9"x9" Orange-Born VAT and Mastic (Not Affected by SOW)**
- **9"x9" Gray VAT w/Beige Specks and Mastic (Not Affected by SOW)**



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- 9"x9" White VAT w/Brown Specks and Mastic (Not Affected by SOW)
- 9"x9" Black VAT w/White Spots and Mastic (Not Affected by SOW)
- 9"x9" Black VAT w/White Marbled and Mastic (Not Affected by SOW)
- Pipe Elbows (Not Affected by SOW)
- Pipe Insulation (Not Affected by SOW)

Analytical results of the bulk samples collected on 08/17/21, 08/19/2021 and 08/27/2021 by WSP indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Gypsum (White) under EPDM Roofing
- Perlite Insulation (tan)
- Fiberboard (brown) under EPDM
- Vent Sealant (Gray)
- Pitch Pocket Sealant (Gray)
- Pitch Pocket Sealant (Black)
- Gray Caulking at Metal Cap Flashing
- Sink Undercoating (Gray)
- Brown Mastic associated w. cove base (2nd Layer)
- Crème adhesive associated w. cove base (1st Layer)
- Blue Cove Base
- 12"x12" White VFT w. Blue Spots
- White Floor Levelling Compound w. Yellow Adhesive
- Acoustical Ceiling Plaster (Gray)
- Ceiling Plaster Patches (White)
- Black Glue dots on wall
- Sealant (White) at pipe edges
- Cementitious Ceiling (Gray)
- Yellow mastic assoc. w. Carpet Flooring
- Mortar assoc. w. ceramic floor tiles
- Backing associated w. ceramic wall tiles
- White textured paint
- Mortar at Cinder Block
- Window Caulking (White)
- Expansion Joint Caulking Brown (At Wall)
- Window Frame Caulking (Gray)
- Stone Sill Caulking (Crème)
- Fiberboard at Floor (Black)
- 2'x4' Suspended Ceiling Tiles
- Cementitious Windowsill (Black)
- Black mastic assoc. w. 12"x12" White VFT w. Brown Spots
- 12"x12" White VFT w. Brown Spots
- Joint compound (white) assoc. w. Gypsum Board
- Gypsum Board (White)
- Backing (grayish/white) assoc. w. ceramic wall tiles



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- Grout (white) assoc. w. ceramic wall tiles
- 12"x12" Gray w. Spots Vinyl Floor Tiles
- Black Mastic assoc. w. 12"x12" Gray w. Spots Vinyl Floor Tiles
- Black Cove Base (6")
- Gray mastic associated w. black cove base (6")
- Wall Plaster (Brown Coat)
- Wall Plaster (White Coat)
- Ceiling Plaster (Brown Coat)
- Ceiling Plaster (White Coat)
- Mortar (gray) at ceramic floor tiles
- Backing (gray) assoc. w. ceramic wall tiles
- Grout (white) assoc. w. ceramic wall tiles
- Gypsum Board (Brown)
- Joint Compound assoc. w. Gypsum Board (white)
- Brick Mortar (gray)
- Louver Caulking (Gray)

Analytical results of bulk samples **previously collected** by Berger indicate that the following materials **did not contain asbestos** (less than 1-percent);

- Glue Dots, Brown
- Gypsum Board, Gray
- Wall Plaster, Brown Coat
- Wall Plaster, White Coat
- Ceiling Insulation, White
- Ceiling Insulation, Brown
- Ceiling Plaster, Brown Coat
- Ceiling Plaster, White Coat
- Glue dots assoc. w. peg board brown
- Pegboard

B. LEAD-BASED PAINT

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

- **White Paint on Metal I-Beam**
- **White Paint on Metal Ceiling**
- **Tan Paint on Metal Ceiling**
- **Tan Paint on Metal I-Beam**
- **White Paint on Wood Door Frame**
- **White Paint on Wood Awning**

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



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- Red Paint on Metal Exterior Door Frame
- Varnish Paint on Wood Door
- Gray Paint on Metal Door Frame
- White Paint on Concrete Wall
- White Paint on Cinderblock Wall
- Red Paint on Metal Radiator Cover
- White Paint on Vinyl Electric Conduit
- White Paint on Metal Electric Conduit
- White Paint on Metal Radiator Cover
- White Paint on Wood Shelves
- Tan Paint on Gypsum Wall
- White Paint on Metal Window Frame
- White Paint on Metal Radiator Cover
- Tan Paint on Metal Column
- Yellow Paint on Gypsum Wall
- Red Paint on Metal Handrail
- Red Paint on Metal Door
- Yellow Paint on Cinder Block Wall
- White Paint on Plaster Wall
- Red Paint on Wood Wall Trim
- Red Paint on Wood Door Frame
- Red Paint on Wood Door
- Yellow Paint on Plaster Wall
- Red Paint on Wood Window Frame
- Beige Paint on Metal Door Frame
- Blue Paint on Metal Door
- Varnish Paint on Wood Window Frame
- Blue Paint on Vinyl Baseboard
- Yellow Paint on Metal Radiator Cover
- Black Paint on Vinyl Baseboard
- Yellow Paint on Corkboard
- Yellow Paint on Glass Window
- Yellow Paint on Wood Window Frame
- Yellow Paint on Concrete Wall
- Red Paint on Metal Column
- White Paint on Wood Door Frame
- Tan Paint on Cinder Block Wall
- White Paint on Cinderblock Wall
- Yellow Paint on Brick Wall
- Blue Paint on Metal Door Frame
- Blue Paint on Cinder Block Wall
- Blue Paint on Metal Radiator Cover
- Red Paint on Metal Door



- Red Paint on Metal Door Frame
- Blue Paint on Metal Door Frame
- Black Paint on Metal Stairs
- Red Paint on Concrete Floor

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):

- Gray Caulking at Metal Cap Flashing
- Brown Expansion Join Caulking
- Gray Expansion Join Caulking
- Beige Door Frame Caulking
- White Window Caulking
- Gray Window Frame Caulking
- Crème Stone Joint Caulking
- Gray Door Frame Caulking
- Gray Louver Frame Caulking



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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 BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Todd 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 08/17/21, 08/19/2021 & 08/27/2021			
-	Roof M, N & O	Metal Roof Deck	Non-Suspect
-		Foam Insulation	Non-Suspect
A		Gypsum (White) under EPDM Roofing	NAD
-	Roof K	Metal Roof Deck	Non-Suspect
B		Perlite Insulation (Tan) under fiberboard	NAD
C	Roof K	Fiberboard (brown) under EPDM Roofing	NAD
-	Roof E	Metal Roof Deck	Non-Suspect
-		Foam Insulation	Non-Suspect
D		Vent Sealant (Gray)	NAD
E	Roof G & L	Pitch Pocket Sealant (Gray)	NAD
F	Roof G	Pitch Pocket Sealant (Black)	NAD
G	Roof L	Gray Caulking at metal cap Flashing	NAD
H	Room 217	Sink Undercoating (Gray)	NAD
I		Brown mastic associated with cove base (2 nd layer)	NAD
J		Crème mastic associated with cove base (2 nd layer)	NAD
K		Blue Cove Base	NAD
L	Interior – Various Locations	12"x12" White Vinyl Floor Tiles with blue spots	NAD
M		White Floor Levelling Compound With Yellow Adhesive	NAD
N	Mechanical Room 247	Acoustical Ceiling Plaster (Gray)	NAD
O		Ceiling Plaster Patches (White)	NAD
P		Black Glue Dots on wall	NAD
Q		Sealant (White) at Pipe Edges	NAD



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HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
R	Exterior – Overhang by Room 121 Exit	Cementitious Ceiling (Gray)	NAD
S	Library 201	Yellow Mastic associated with carpet flooring	NAD
T	Boys and Girls Toilets	Mortar associated with ceramic floor tiles	NAD
U		Backing associated with ceramic wall tiles	NAD
AP		Grout (white) associated with ceramic wall tiles	NAD
V	Exterior – Various Locations	White Textured Paint	NAD
W	Throughout	Mortar at Cinderblock Walls	NAD
X		Window Caulking (White)	NAD
Y	Exterior (2001 Bldg.)	Expansion Joint Caulking (Brown)	NAD
Z	Exterior – Stair 6 Courtyard	Tar at Foundation Wall	2.5% Chrysotile
AA	Exterior (1955 & 1963 Bldg.)	Beige Door Frame Caulking	1.7% Chrysotile
AB	Exterior (1955 & 1963 Bldg.)	Expansion Joint Caulking (Gray) at Wall	3.1% Anthophyllite
AC	Exterior (1995 Bldg.)	Window Frame Caulking (Gray)	NAD
AD	Exterior (Throughout)	Stone Sill Caulking (Crème)	NAD
AE	Exterior (1952 & 1963 Bldg.)	Gray Door Frame Caulking (Wooden Trim Doors)	4.2% Chrysotile
AF	Exterior Stair 6 Courtyard	Fiberboard at Floor (Black)	NAD
AG	Classroom 110	2'x4' Suspended Ceiling Tiles	NAD
AH	Interior – Corridors	Cementitious Windowsill (Black)	NAD
AI	Interior – Corridor 260	Cementitious Windowsill (White)	33% Chrysotile
AJ	Interior – Various Locations	Black mastic associated w. 12"x12" white vinyl floor tiles w. brown spots	NAD
AK		12"x12" white vinyl floor tiles w. brown spots	NAD
AL	Interior – Library 201	Sealant (beige) at brick expansion joint	2.6% Chrysotile
-		Metal radiator w. metal pipes and vinyl wires	Non-Suspect
AM	Interior – Various Locations	Joint Compound (White) associated with gypsum board	NAD
AN		Gypsum Board (White)	NAD



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HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
AO	Interior – Various Locations	Backing (grayish/white) associated with ceramic wall tiles	NAD
AP		Grout (white) associated with ceramic wall tiles	NAD
AQ		12"x12" Gray with spots Vinyl Floor Tiles	NAD
AR		Black Mastic associated with 12"x12" Gray with spots VFT	NAD
AS		Black 6" Cove Base	NAD
AT		Gray mastic associated w. black cove base (6")	NAD
AU	Interior – Lobby/Nurse/Toilets (1952 Bldg.)	Wall Plaster (Brown Coat)	NAD
AV		Wall Plaster (White Coat)	NAD
AW		Ceiling Plaster (Brown Coat)	NAD
AX		Ceiling Plaster (White Coat)	NAD
-		Ceiling Insulation, White	HA previous survey 12.05.19 (NAD)
-		Ceiling Insulation, Brown	
AY		Mortar (Gray) at ceramic floor tiles	NAD
AZ		Backing (gray) assoc. w. ceramic wall tiles	NAD
BA		Grout (white) assoc. w. ceramic wall tiles	NAD
BB	Exterior – Awning by Lobby 160	Gypsum Board (Brown)	NAD
BC		Joint Compound assoc. w. gypsum board (white)	NAD
BD	Exterior – Throughout	Brick Mortar (gray)	NAD
BE	Exterior – Throughout	Louver caulking (Gray)	NAD
As Per 2019 AHERA Report			
01	Interior – Various Locations ¹	9"x9" White VAT w/Black Specks and Mastic ¹	ACM ¹
02		9"x9" Blue VAT w/White Specks and Mastic ¹	ACM ¹
03		9"x9" Tan VAT w/Black Marbled and Mastic ¹	ACM ¹
04		9"x9" Orange-Born VAT and Mastic ¹	ACM ¹
05		9"x9" Gray VAT w/Beige Specks and Mastic ¹	ACM ¹
06		9"x9" White VAT w/Brown Specks and Mastic ¹	ACM ¹
07		9"x9" Black VAT w/White Spots and Mastic ¹	ACM ¹



HOMOGENOUS MATERIAL	LOCATION	MATERIAL	ASBESTOS CONTENT
08	Interior – Various Locations ¹	9”x9” Black VAT w/White Marbled and Mastic ¹	ACM ¹
09		Pipe Elbows ¹	ACM ¹
10		Pipe Insulation ¹	ACM ¹
Previous Sampled by Berger			
01	Room 110	Glue Dots, Brown	NAD
02	Room 110	Gypsum Board, Gray	NAD
03	Room 110	Wall Plaster, Brown Coat	NAD
04	Room 110	Wall Plaster, White Coat	NAD
05	Elec. Room	Ceiling Insulation, White	NAD
06	Elec. Room	Ceiling Insulation, Brown	NAD
07	Elec. Room	Ceiling Plaster, Brown Coat	NAD
08	Elec. Room	Ceiling Plaster, White Coat	NAD
01	Room 110	Glue dots assoc. w pegboard brown	NAD
02	Room 110	Pegboard	NAD

Bold = Positive for ACM **NAD = No Asbestos Detected** **NA/PS = Not analyzed/ positive sample**
Note: ¹ Not affected by current scope of work.

4.2 CONDITION AND FRIABILITY 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
Exterior – Stair 6 Courtyard	Tar at Foundation Wall	8 SF	Non-Friable	Good
Exterior (1955 & 1963 Bldg.) (Stair 6 Courtyard)	Beige Door Frame Caulking	50 LF	Non-Friable	Good
	Expansion Joint Caulking (Gray) at Wall	8 LF	Non-Friable	Good
Exterior (1952 & 1963 Bldg.)	Gray Door Frame Caulking (Wooden Trim Doors)	370 LF	Non-Friable	Good
Interior – Corridor 260	Cementitious Windowsills (White)	44 SF	Non-Friable	Good
Interior – Library 201	Sealant (beige) at brick expansion joint	15 LF	Non-Friable	Good



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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 BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Todd 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	---	---	---	---	1.0
2	Calibration Check @ 1.0	---	---	---	---	1.0
3	Calibration Check @ 1.0	---	---	---	---	1.1
4	Calibration Check @ 0.0	---	---	---	---	0.1
5	Calibration Check @ 0.0	---	---	---	---	0.2
6	Calibration Check @ 0.0	---	---	---	---	-0.1
7	Men's Bathroom by 156	Exterior Door Frame	Red	Metal	Good	0.2
8	Men's Bathroom by 156	Door	Varnish	Wood	Good	-0.1
9	Men's Bathroom by 156	Door Frame	Gray	Metal	Fair	0.6
10	Men's Bathroom by 156	Wall	White	Concrete	Fair	-0.1
11	Men's Bathroom by 156	Upper Wall	White	Cinderblock	Good	-0.2
12	Men's Bathroom by 156	Radiator Cover	Red	Metal	Good	0.2
13	Men's Bathroom by 156	I-Beam	White	Metal	Good	3.2
14	Men's Bathroom by 156	Ceiling	White	Metal	Good	1.8
15	Men's Bathroom by 156	Conduit	White	Vinyl	Good	0.5
16	Men's Bathroom by 156	Conduit	White	Metal	Good	0.4



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Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
17	Women's Bathroom by 156	Radiator Cover	White	Metal	Fair	0.2
18	Closet across from 155	Shelves	White	Wood	Fair	0.3
19	Closet across from 155	I-Beam	Tan	Metal	Good	2.9
20	Closet across from 155	Ceiling	Tan	Metal	Good	3.2
21	Storage Room in 209	Ceiling	White	Metal	Good	1.6
22	Library 201	Wall	Tan	Gypsum	Good	0.2
23	Library 201	Window Frame	White	Metal	Fair	0.2
24	Library 201	Radiator Cover	White	Metal	Good	0.1
25	Library 201	Column	Tan	Metal	Good	0.2
26	Hall Outside of Special Services	Wall	Yellow	Gypsum	Good	0.2
27	Hall Outside of Special Services	Handrail	Red	Metal	Good	0.0
28	Hall Outside of Special Services	Door	Red	Metal	Fair	0.1
29	Hall Outside of Special Services	Wall	Yellow	Cinderblock	Good	-0.1
30	General Office	Wall	White	Plaster	Good	-0.4
31	Nurses Office	Wall Trim	Red	Wood	Good	0.1
32	Nurses' Bathroom	Door Frame	Red	Wood	Good	0.3
33	Nurses' Bathroom	Door	Red	Wood	Good	0.1
34	Nurses' Bathroom	Wall	Yellow	Plaster	Good	0.0
35	Hall outside General Office	Window Frame	Red	Wood	Good	-0.1
36	General Office Mailroom	Door Frame	Beige	Metal	Fair	0.4
37	General Office Mailroom	Door	Blue	Metal	Good	0.1
38	General Office	Window Frame	Varnish	Wood	Good	0.1
39	Large Courtyard	Door Frame	White	Wood	Good	1.3
40	Corridor 133	Baseboard	Blue	Vinyl	Good	0.1
41	Corridor 133	Radiator Cover	Yellow	Metal	Good	0.2
42	Corridor 133	Baseboard	Black	Vinyl	Fair	0
43	Hall by 232	Corkboard	Yellow	Corkboard	Good	0.1
44	Hall by 225	Window	Yellow	Glass	Good	0.2
45	Hall by 225	Window Frame	Yellow	Wood	Good	0.0
46	Hall by 225	Lower Wall	Yellow	Concrete	Good	0.2
47	Hall by 225	Column	Red	Metal	Good	0.5
48	Small Courtyard	Door Frame	White	Wood	Fair	0.2
49	Small Courtyard	Wall	Tan	Cinderblock	Good	0.0
50	Small Courtyard	Wall	White	Cinderblock	Good	0.1
51	Hall Outside Small Courtyard	Wall	Yellow	Brick	Good	0.0



Final Report for Environmental Inspection Services

Test Number	Sample Location	Building Component	Color	Substrate	Condition	Lead Content (mg/cm2)
52	Book Room 217	Door Frame	Blue	Metal	Good	0.6
53	Book Room 217	Wall	Blue	Cinderblock	Good	0.0
54	Book Room 217	Radiator Cover	Blue	Metal	Good	0.2
55	Gym Courtyard	Door	Red	Metal	Good	0.1
56	Gym Courtyard	Door Frame	Red	Metal	Good	0.5
57	Gym Courtyard	Awning	White	Wood	Good	1.5
58	Gym Courtyard	Door Frame	Blue	Metal	Good	0.4
59	Gym Courtyard	Stairs	Black	Metal	Good	0.1
60	Mechanical Room	Floor	Red	Concrete	Fair	0.3
61	Calibration Check @ 1.0	---	---	---	---	1.1
62	Calibration Check @ 1.0	---	---	---	---	1.1
63	Calibration Check @ 1.0	---	---	---	---	1.1
64	Calibration Check @ 0.0	---	---	---	---	0.2
65	Calibration Check @ 0.0	---	---	---	---	0.1
66	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 BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Todd Elementary School. The following suspect materials were tested for PCB content:

HOMOGENOUS MATERIAL	LOCATION	MATERIAL	PCB CONTENT (PPM)
A	Roof L	Gray Caulking at Metal Cap Flashing	ND
B	Stair 6 Courtyard	Brown Expansion Join Caulking	ND
C		Gray Expansion Join Caulking	ND
D		Beige Door Frame Caulking	ND
E	Throughout	White Window Caulking	ND
F		Gray Window Frame Caulking	ND
G		Crème Stone Joint Caulking	ND
H		Gray Door Frame Caulking	ND
I		Gray Louver Frame Caulking	ND

Bold = Positive for PCB

ND = No PCB Detected



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 and LBP have been identified in this inspection that may be impacted as part of the proposed BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Todd Elementary School, reported in Section 3.0 of this report, may require complete removal prior to the start of the upgrade project.

No PCB was identified in this inspection that may be impacted as part of the proposed BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Todd Elementary School.

The ACM, LBP & PCB inspection was conducted at the request of Briarcliff Manor Union Free School District for the proposed BBS Architects, Landscape Architects, & Engineers, P.C. Phase 1, 2 & 3 project at the Todd 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.



Final Report for Environmental Inspection Services

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 Todd Elementary School.

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:

A black ink signature of Stephen Gruber, consisting of a stylized 'S' followed by a horizontal line and a diagonal stroke.

Stephen Gruber
NYS DOL Inspector

Reviewed by:

A blue ink signature of Craig Napolitano, featuring a stylized 'C' and 'N' with a horizontal line and a diagonal stroke.

Craig Napolitano, CHMM
Vice President, Emergency
Management & IH Services



**APPENDIX A:
ASBESTOS SAMPLE ANALYSIS RESULTS IN TABULAR FORM**



Final Report for Environmental Inspection Services

APPENDIX A SAMPLE ANALYSIS RESULTS IN TABULAR FORM TODD ELEMENTARY SCHOOL 45 INGHAM ROAD BRIARCLIFF MANOR, NY 10510

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
WSP Sampled on 08/17/2021 & 08/19/2021					
A	01	Roof O	Gypsum (White) under EPDM Roofing	NAD	N/A
	02	Roof M		NAD	N/A
B	03	Roof K	Perlite Insulation (tan)	NAD	N/A
	04			NAD	N/A
	05			NAD	N/A
C	06		Fiberboard (brown) under EPDM	NAD	N/A
	07			NAD	N/A
D	08	Roof E	Vent Sealant (Gray)	NAD	NAD
	09			NAD	NAD
E	10	Roof G	Pitch Pocket Sealant (Gray)	NAD	NAD
	11	Roof L		NAD	NAD
F	12	Roof G	Pitch Pocket Sealant (Black)	NAD	NAD
	13			NAD	NAD
G	14	Roof L	Gray Caulking at Metal Cap Flashing	NAD	NAD
	15			NAD	NAD
H	16	Room 217	Sink Undercoating (Gray)	NAD	NAD

Bold = Positive for ACM
NAD = No Asbestos Detected

N/A = Not Applicable
NA/PS = Not analyzed/ positive sample



Final Report for Environmental Inspection Services

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
H	17	Room 217	Sink Undercoating (Gray)	NAD	NAD
I	18		Brown Mastic associated w. cove base (2 nd Layer)	NAD	NAD
	19			NAD	NAD
J	20		Crème adhesive associated w. cove base (1 st Layer)	NAD	NAD
	21			NAD	NAD
K	22		Blue Cove Base	NAD	NAD
	23			NAD	NAD
L	24		12"x12" White VFT w. Blue Spots	NAD	NAD
	25			NAD	NAD
M	26A		White Floor Levelling Compound w. Yellow Adhesive	NAD	N/A
	26B			NAD	NAD
	27A			NAD	N/A
	27B			NAD	NAD
N	28	Mechanical Room 247	Acoustical Ceiling Plaster (Gray)	NAD	N/A
	29			NAD	N/A
	30			NAD	N/A
O	31		Ceiling Plaster Patches (White)	NAD	N/A
	32			NAD	N/A
	33			NAD	N/A
P	34		Black Glue dots on wall	NAD	NAD
	35			NAD	NAD
Q	36		Sealant (White) at pipe edges	NAD	NAD

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 NAD = No Asbestos Detected

N/A = Not Applicable
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Final Report for Environmental Inspection Services

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
Q	37	Mechanical Room 247	Sealant (white) at pipe edges	NAD	NAD
	38			NAD	NAD
R	39	Exterior – Overhang by Room 121 Exit	Cementitious Ceiling (Gray)	NAD	N/A
	40			NAD	N/A
S	41	Library 201	Yellow mastic assoc. w. Carpet Flooring	NAD	NAD
	42			NAD	NAD
T	43	Boys Toilet by Mail	Mortar assoc. w. ceramic floor tiles	NAD	N/A
	44	Girls Toilet by Mail		NAD	N/A
U	45	Boys Toilet by Mail	Backing associated w. ceramic wall tiles	NAD	N/A
	46	Girls Toilet by Mail		NAD	N/A
V	47	Courtyard by Classroom 242	White textured paint	NAD	NAD
	48	Courtyard by Classroom 175		NAD	NAD
W	49	Courtyard by Classroom 242	Mortar at Cinder Block	NAD	N/A
	50	Courtyard by Classroom 175		NAD	N/A
X	51	Courtyard by Classroom 242	Window Caulking (White)	NAD	NAD
	52	Courtyard by Classroom 175		NAD	NAD
Y	53	Stair 6 Courtyard	Expansion Joint Caulking Brown (At Wall)	NAD	NAD
	54			NAD	NAD
Z	55		Tar at Foundation Wall	Trace (<1%) Chrysotile	2.5% Chrysotile
	56			Trace (<1%) Chrysotile	NA/PS
AA	57		Beige Door Frame Caulking	Trace (<1%) Chrysotile	1.7% Chrysotile

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Final Report for Environmental Inspection Services

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
AA	58	Stair 6 Courtyard	Beige Door Frame Caulking	Trace (<1%) Chrysotile	NA/PS
AB	59		Expansion Join Caulking (Gray) at wall	NAD	0.8% Chrysotile 3.1% Anthophyllite
	60			NAD	NA/PS
AC	61	Courtyard by Classroom 245	Window Frame Caulking (Gray)	NAD	NAD
	62			NAD	NAD
AD	63	Courtyard by Classroom 245	Stone Sill Caulking (Crème)	NAD	NAD
	64			NAD	NAD
AE	65	Exterior – Kindergarten Courtyard	Gray Door Frame Caulking	Trace (<1%) Chrysotile	4.2% Chrysotile 1.7% Anthophyllite
	66			Trace (<1%) Chrysotile	NA/PS
AF	67	Stair 6 Courtyard	Fiberboard at Floor (Black)	NAD	NAD
	68			NAD	NAD
AG	69	Classroom 110	2’x4’ Suspended Ceiling Tiles	NAD	NAD
	70			NAD	NAD
WSP Sampled on 08/27/2021					
AH	71	Corridor 258 adjacent Rm 232	Cementitious Windowsill (Black)	NAD	NAD
	72	Corridor 254 adjacent Rm 241		NAD	NAD
AI	73	Corridor 260	Cementitious Windowsill (White)	33% Chrysotile	NA/PS
	74			NA/PS	NA/PS
AJ	75	Corridor adj Rm 227	Black mastic assoc. w. 12”x12” White VFT w. Brown Spots	NAD	NAD
	76	Corridor 260		NAD	NAD

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Final Report for Environmental Inspection Services

Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
AK	77	Corridor adj Rm 227	12"x12" White VFT w. Brown Spots	NAD	NAD
	78	Corridor 260	12"x12" White VFT w. Brown Spots	NAD	NAD
AL	79	Library 201	Sealant (beige) at brick expansion join	2.6 % Chrysotile	NA/PS
	80			NA/PS	NA/PS
AM	81	Library 201	Joint compound (white) assoc. w. Gypsum Board	NAD	N/A
	82			NAD	N/A
AN	83	Closet near Mail Room	Gypsum Board (White)	NAD	N/A
	84			NAD	N/A
AO	85	Boys adj Rm 201	Backing (grayish/white) assoc. w. ceramic wall tiles	NAD	N/A
	86			NAD	N/A
AP	87		Grout (white) assoc. w. ceramic wall tiles	NAD	N/A
	88			NAD	N/A
AQ	89	Corridor 130	12"x12" Gray w. Spots Vinyl Floor Tiles	NAD	NAD
	90			NAD	NAD
AR	91		Black Mastic assoc. w. 12"x12" Gray w. Spots Vinyl Floor Tiles	NAD	NAD
	92			NAD	NAD
AS	93	Corridor adj Rm 220	Black Cove Base (6")	NAD	NAD
	94	Corridor adj Rm 227		NAD	NAD
AT	95	Corridor adj Rm 220	Gray mastic associated w. black cove base (6")	NAD	NAD
	96	Corridor adj Rm 227		NAD	NAD

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Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
AU	97	Lobby 100	Wall Plaster (Brown Coat)	NAD	N/A
	98	Nurse 103		NAD	N/A
	99			NAD	N/A
AV	100	Lobby 100	Wall Plaster (White Coat)	NAD	N/A
	101	Nurse 103		NAD	N/A
	102	Nurse 103 – Toilet		NAD	N/A
AW	103	Nurse 103 – Toilet	Ceiling Plaster (Brown Coat)	NAD	N/A
	104	Girls Toilet by Lobby 100		NAD	N/A
	105			NAD	N/A
AX	106	Nurse 103 – Toilet	Ceiling Plaster (White Coat)	NAD	N/A
	107	Girls Toilet by Lobby 100		NAD	N/A
	108			NAD	N/A
AY	109	Nurse Toilet	Mortar (gray) at ceramic floor tiles	NAD	N/A
	110			NAD	N/A
AZ	111	Girls Toilet by Lobby 100	Backing (gray) assoc. w. ceramic wall tiles	NAD	N/A
	112			NAD	N/A
BA	113	Nurse Toilet	Grout (white) assoc. w. ceramic wall tiles	NAD	N/A
	114			NAD	N/A
BB	115	Exterior – Awning by Lobby 160	Gypsum Board (Brown)	NAD	N/A
	116			NAD	N/A

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Homogeneous Area No.	Sample No.	Location	Material	PLM Result	TEM Result
BC	117	Exterior – Awning by Lobby 160	Joint Compound assoc. w. Gypsum Board (white)	NAD	N/A
	118			NAD	N/A
BD	119	Exterior – Stair 6 Courtyard	Brick Mortar (gray)	NAD	N/A
	120	Exterior – North		NAD	N/A
BE	121	Exterior – By Classroom 123	Louver Caulking (Gray)	NAD	NAD
	122	Exterior – By Classroom 234		NAD	NAD

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**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
Collected by: Client
Project Name/No.: Briarcliff Manor UFSD / 31403475.005
Project Address: Todd Elementary School
Work Area: Various Locations

Lab ID: BK0821371
Date Received: 8/23/2021
PLM Date Analyzed: 8/25/2021
TEM Date Analyzed: 8/26/2021
Report Date: 8/26/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
A01	BK0821371-1	Roof O - Gypsum (White) under EPDM Roofing	Beige, Homogeneous, Friable	Not Applicable			30%FBGL	70%	NAD	
A02	BK0821371-2	Roof M - Gypsum (White) under EPDM Roofing	Beige, Homogeneous, Friable	Not Applicable			30%FBGL	70%	NAD	
B03	BK0821371-3	Roof K - Perlite Insulation (Tan)	Grey, Homogeneous, Friable	Not Applicable			30%CELL 10%FOAM	60%	NAD	
B04	BK0821371-4	Roof K - Perlite Insulation (Tan)	Grey, Homogeneous, Friable	Not Applicable			30%CELL 10%FOAM	60%	NAD	
B05	BK0821371-5	Roof K - Perlite Insulation (Tan)	Grey, Homogeneous, Friable	Not Applicable			30%CELL 10%FOAM	60%	NAD	
C06	BK0821371-6	Roof K - Fiberboard (Brown) under EPDM	Brown, Homogeneous, Friable	Not Applicable			95%WOOD	5%	NAD	
C07	BK0821371-7	Roof K - Fiberboard (Brown) under EPDM	Brown, Homogeneous, Friable	Not Applicable			95%WOOD	5%	NAD	
D08	BK0821371-8	Roof E - Vent Sealant (Gray)	Grey, Homogeneous, Non-Fibrous	34.4	19.7	45.9	0%	100%	NAD Inconclusive	NAD
D09	BK0821371-9	Roof E - Vent Sealant (Gray)	Grey, Homogeneous, Non-Fibrous	35.8	21.6	42.5	0%	100%	NAD Inconclusive	NAD
E10	BK0821371-10	Roof G - Pitch Pocket Sealant (gray)	Grey, Homogeneous, Non-Fibrous	65.1	4.2	30.7	0%	100%	NAD Inconclusive	NAD



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							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
E10	BK0821371-11	Roof L - Pitch Pocket Sealant (gray)	Black, Homogeneous, Non-Fibrous	65.4	8.6	26.0	0%	100%	NAD Inconclusive	NAD
F12	BK0821371-12	Roof G - Pitch Pocket Sealant (Black)	Black, Homogeneous, Non-Fibrous	56.2	5.6	38.2	0%	100%	NAD Inconclusive	NAD
F13	BK0821371-13	Roof G - Pitch Pocket Sealant (Black)	Black, Homogeneous, Non-Fibrous	65.2	6.6	28.2	0%	100%	NAD Inconclusive	NAD
G14	BK0821371-14	Roof L - Gray Caulking at Metal Cap Flashing	Grey, Homogeneous, Non-Fibrous	61.6	8.8	29.6	0%	100%	NAD Inconclusive	NAD
G15	BK0821371-15	Roof L - Gray Caulking at Metal Cap Flashing	Grey, Homogeneous, Non-Fibrous	59.8	8.0	32.3	0%	100%	NAD Inconclusive	NAD
H16	BK0821371-16	Room 217 - Sink Undercoating (Grey)	Grey, Homogeneous, Non-Fibrous	30.3	20.5	49.2	0%	100%	NAD Inconclusive	NAD
H17	BK0821371-17	Room 217 - Sink Undercoating (Grey)	Grey, Homogeneous, Non-Fibrous	31.6	27.1	41.3	0%	100%	NAD Inconclusive	NAD
I18	BK0821371-18	Room 217 - Brown Mastic associated with Cove Base (2nd Layer)	Brown, Homogeneous, Non-Fibrous	48.5	16.7	34.8	0%	100%	NAD Inconclusive	NAD
I19	BK0821371-19	Room 217 - Brown Mastic associated with Cove Base (2nd Layer)	Brown, Homogeneous, Non-Fibrous	51.7	17.1	31.1	0%	100%	NAD Inconclusive	NAD
J20	BK0821371-20	Room 217 - Creme Adhesive Associated with Cove Base (1st Layer)	Beige, Homogeneous, Non-Fibrous	29.0	3.0	68.0	0%	100%	NAD Inconclusive	NAD



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Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
J21	BK0821371-21	Room 217 - Creme Adhesive Associated with Cove Base (1st Layer)	Beige, Homogeneous, Non-Fibrous	23.3	1.8	74.9	0%	100%	NAD Inconclusive	NAD
K22	BK0821371-22	Room 217 - Blue Cove Base	Blue, Homogeneous, Non-Fibrous	55.2	1.5	43.3	0%	100%	NAD Inconclusive	NAD
K23	BK0821371-23	Room 217 - Blue Cove Base	Blue, Homogeneous, Non-Fibrous	54.5	2.2	43.2	0%	100%	NAD Inconclusive	NAD
L24	BK0821371-24	Room 217 - 12"x12" White VFT with Blue Spots	White, Homogeneous, Non-Fibrous	17.4	2.2	80.4	0%	100%	NAD Inconclusive	NAD
L25	BK0821371-25	Room 217 - 12"x12" White VFT with Blue Spots	White, Homogeneous, Non-Fibrous	25.0	11.9	63.1	0%	100%	NAD Inconclusive	NAD
M26	BK0821371-26A	Room 217 - White Floor Leveling Compound with Yellow Adhesive	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
M26	BK0821371-26B	Room 217 - White Floor Leveling Compound with Yellow Adhesive	Beige, Homogeneous, Non-Fibrous	36.5	25.8	37.7	0%	100%	NAD Inconclusive	NAD
M27	BK0821371-27A	Room 217 - White Floor Leveling Compound with Yellow Adhesive	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
M27	BK0821371-27B	Room 217 - White Floor Leveling Compound with Yellow Adhesive	Beige, Homogeneous, Non-Fibrous	41.9	15.7	42.5	0%	100%	NAD Inconclusive	NAD
N28	BK0821371-28	Mechanical Room 247 - Acoustical Ceiling Plaster (Grey)	Grey, Homogeneous, Friable	Not Applicable			5%FOAM	95%	NAD	



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Project Address: Todd Elementary School
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Lab ID: BK0821371
Date Received: 8/23/2021
PLM Date Analyzed: 8/25/2021
TEM Date Analyzed: 8/26/2021
Report Date: 8/26/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
N29	BK0821371-29	Mechanical Room 247 - Acoustical Ceiling Plaster (Grey)	Grey, Homogeneous, Friable	Not Applicable			5%FOAM	95%	NAD	
N30	BK0821371-30	Mechanical Room 247 - Acoustical Ceiling Plaster (Grey)	Grey, Homogeneous, Friable	Not Applicable			5%FOAM	95%	NAD	
O31	BK0821371-31	Mechanical Room 247 - Ceiling Plaster Patches (White)	White, Homogeneous, Friable	Not Applicable			5%FOAM	95%	NAD	
O32	BK0821371-32	Mechanical Room 247 - Ceiling Plaster Patches (White)	White, Homogeneous, Friable	Not Applicable			5%FOAM	95%	NAD	
O33	BK0821371-33	Mechanical Room 247 - Ceiling Plaster Patches (White)	White, Homogeneous, Friable	Not Applicable			5%FOAM	95%	NAD	
P34	BK0821371-34	Mechanical Room 247 - Black Glue Dots on Wall	Black, Homogeneous, Non-Fibrous	18.8	8.6	72.6	0%	100%	NAD Inconclusive	NAD
P35	BK0821371-35	Mechanical Room 247 - Black Glue Dots on Wall	Black, Homogeneous, Non-Fibrous	24.7	10.1	65.2	0%	100%	NAD Inconclusive	NAD
Q36	BK0821371-36	Mechanical Room 247 - Sealant (White) at Pipe Edges	White, Homogeneous, Non-Fibrous	42.6	30.3	27.0	0%	100%	NAD Inconclusive	NAD
Q37	BK0821371-37	Mechanical Room 247 - Sealant (White) at Pipe Edges	White, Homogeneous, Non-Fibrous	42.7	15.8	41.5	0%	100%	NAD Inconclusive	NAD
Q38	BK0821371-38	Mechanical Room 247 - Sealant (White) at Pipe Edges	White, Homogeneous, Non-Fibrous	43.1	27.1	29.8	0%	100%	NAD Inconclusive	NAD



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
Collected by: Client
Project Name/No.: Briarcliff Manor UFSD / 31403475.005
Project Address: Todd Elementary School
Work Area: Various Locations

Lab ID: BK0821371
Date Received: 8/23/2021
PLM Date Analyzed: 8/25/2021
TEM Date Analyzed: 8/26/2021
Report Date: 8/26/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
R39	BK0821371-39	Exterior - Overhang by Room 127 Exit - Cementitious Ceiling (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
R40	BK0821371-40	Exterior - Overhang by Room 127 Exit - Cementitious Ceiling (Grey)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
S41	BK0821371-41	Library 201 - Yellow Mastic Associated with Carpet Flooring	Brown, Homogeneous, Non-Fibrous	48.1	15.3	36.6	0%	100%	NAD Inconclusive	NAD
S42	BK0821371-42	Library 201 - Yellow Mastic Associated with Carpet Flooring	Brown, Homogeneous, Non-Fibrous	47.9	24.3	27.9	0%	100%	NAD Inconclusive	NAD
T43	BK0821371-43	Boys Toilet by mail - Mortar Associated with Ceramic Floor Tiles	Grey, Homogeneous, Friable	Not Applicable			5%CELL	95%	NAD	
T44	BK0821371-44	Girls Toilet by mail - Mortar Associated with Ceramic Floor Tiles	Grey, Homogeneous, Friable	Not Applicable			5%CELL	95%	NAD	
U45	BK0821371-45	Boys Toilet by mail - Backing associated with Wall Tiles	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
U46	BK0821371-46	Girls Toilet by mail - Backing associated with Wall Tiles	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
V47	BK0821371-47	Courtyard by Classroom 242 - White Textured Paint	White, Homogeneous, Non-Fibrous	39.3	30.0	30.7	0%	100%	NAD Inconclusive	NAD
V48	BK0821371-48	Courtyard by Classroom 175 - White Textured Paint	White, Homogeneous, Non-Fibrous	33.0	34.0	33.0	0%	100%	NAD Inconclusive	NAD



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Bulk Asbestos Report by PLM-TEM

Client: WSP
Collected by: Client
Project Name/No.: Briarcliff Manor UFSD / 31403475.005
Project Address: Todd Elementary School
Work Area: Various Locations

Lab ID: BK0821371
Date Received: 8/23/2021
PLM Date Analyzed: 8/25/2021
TEM Date Analyzed: 8/26/2021
Report Date: 8/26/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
W49	BK0821371-49	Courtyard by Classroom 242 - Mortar at Cinderblock	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
W50	BK0821371-50	Courtyard by Classroom 175 - Mortar at Cinderblock	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
X51	BK0821371-51	Courtyard by Classroom 242 - Widow Caulking (White)	White, Homogeneous, Non-Fibrous	35.1	3.8	61.1	0%	100%	NAD Inconclusive	NAD
X52	BK0821371-52	Courtyard by Classroom 175 - Widow Caulking (White)	White, Homogeneous, Non-Fibrous	41.6	12.2	46.2	0%	100%	NAD Inconclusive	NAD
Y53	BK0821371-53	Stair 6 Courtyard - Expansion Joint Caulking Brown (At Wall)	Red, Homogeneous, Non-Fibrous	51.0	22.8	26.2	0%	100%	NAD Inconclusive	NAD
Y54	BK0821371-54	Stair 6 Courtyard - Expansion Joint Caulking Brown (At Wall)	Red, Homogeneous, Non-Fibrous	48.7	26.8	24.5	0%	100%	NAD Inconclusive	NAD
Z55	BK0821371-55	Stair 6 Courtyard - Tar Foundation Wall	Black, Homogeneous, Non-Fibrous	44.3	24.5	31.2	0%	~99%	Trace (<1%)CHRY Inconclusive	2.5%CHRY
Z56	BK0821371-56	Stair 6 Courtyard - Tar Foundation Wall	Black, Homogeneous, Non-Fibrous	40.2	25.7	34.1	0%	~99%	Trace (<1%)CHRY Inconclusive	Not Analyzed
AA57	BK0821371-57	Stair 6 Courtyard - Beige Door Frame Caulking	Beige, Homogeneous, Non-Fibrous	45.6	11.0	43.4	0%	~99%	Trace (<1%)CHRY Inconclusive	1.7%CHRY
AA58	BK0821371-58	Stair 6 Courtyard - Beige Door Frame Caulking	Beige, Homogeneous, Non-Fibrous	41.2	11.5	47.3	0%	~99%	Trace (<1%)CHRY Inconclusive	Not Analyzed



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Bulk Asbestos Report by PLM-TEM

Client: WSP
Collected by: Client
Project Name/No.: Briarcliff Manor UFSD / 31403475.005
Project Address: Todd Elementary School
Work Area: Various Locations

Lab ID: BK0821371
Date Received: 8/23/2021
PLM Date Analyzed: 8/25/2021
TEM Date Analyzed: 8/26/2021
Report Date: 8/26/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
AB59	BK0821371-59	Stair 6 Courtyard - Expansion Joint Caulking Grey (At Wall)	Grey, Homogeneous, Non-Fibrous	25.7	15.5	58.8	0%	100%	NAD Inconclusive	0.8%CRY 3.1%ANTH
AB60	BK0821371-60	Stair 6 Courtyard - Expansion Joint Caulking Grey (At Wall)	Grey, Homogeneous, Non-Fibrous	30.8	16.2	53.0	0%	100%	NAD Inconclusive	Not Analyzed
AC61	BK0821371-61	Courtyard by Classroom 245 - Window Frame Caulking (Grey)	Grey, Homogeneous, Non-Fibrous	68.6	8.9	22.5	0%	100%	NAD Inconclusive	NAD
AC62	BK0821371-62	Courtyard by Classroom 245 - Window Frame Caulking (Grey)	Grey, Homogeneous, Non-Fibrous	65.8	7.4	26.8	0%	100%	NAD Inconclusive	NAD
AD63	BK0821371-63	Courtyard by Classroom 175 - Stone Sill Caulking (Crème)	Beige, Homogeneous, Non-Fibrous	42.2	43.3	14.6	0%	100%	NAD Inconclusive	NAD
AD64	BK0821371-64	Courtyard by Classroom 175 - Stone Sill Caulking (Crème)	Beige, Homogeneous, Non-Fibrous	48.1	24.4	27.5	0%	100%	NAD Inconclusive	NAD
AE65	BK0821371-65	Exterior - Kindergarten Courtyard - Gray Door Frame Caulking	Grey, Homogeneous, Non-Fibrous	18.9	16.8	64.3	0%	~99%	Trace (<1%) CHRY Inconclusive	4.2%CHRY 1.7%ANTH
AE66	BK0821371-66	Exterior - Kindergarten Courtyard - Gray Door Frame Caulking	Grey, Homogeneous, Non-Fibrous	22.9	14.7	62.4	0%	~99%	Trace (<1%) CHRY Inconclusive	Not Analyzed
AF67	BK0821371-67	Stair 6 Courtyard - Fiberboard at Floor (Black)	Black, Homogeneous, Non-Fibrous	91.8	6.5	1.8	0%	100%	NAD Inconclusive	NAD
AF68	BK0821371-68	Stair 6 Courtyard - Fiberboard at Floor (Black)	Black, Homogeneous, Non-Fibrous	79.7	4.0	16.4	0%	100%	NAD Inconclusive	NAD



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Bulk Asbestos Report by PLM-TEM

Client: WSP
Collected by: Client
Project Name/No.: Briarcliff Manor UFSD / 31403475.005
Project Address: Todd Elementary School
Work Area: Various Locations

Lab ID: BK0821371
Date Received: 8/23/2021
PLM Date Analyzed: 8/25/2021
TEM Date Analyzed: 8/26/2021
Report Date: 8/26/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASl%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
AG69	BK0821371-69	Classroom 110 - 2'x4' Suspended Ceiling Tiles	Grey, Homogeneous, Non-Fibrous	21.5	69.9	8.6	0%	100%	NAD Inconclusive	NAD
AG70	BK0821371-70	Classroom 110 - 2'x4' Suspended Ceiling Tiles	Grey, Homogeneous, Non-Fibrous	18.1	47.7	34.2	0%	100%	NAD Inconclusive	NAD

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.

MG

NAD=no asbestos detected, NA/PS=Not Analyzed/Positive Stop, Trace=<1%, FBGL=Fiberglass, CELL=Cellulose, CHRY=Chrysotile, Amo=Amosite, CRO=Crocidolite, ANTH=Anthophyllite, 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%, All= Acid Insoluble Inorganic%, ASl= 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, CT Reg. ID: PH-0154

PLM Analyst: AS

TEM Analyst: VR

Approved by:

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 1 OF 6

PROJECT NO.: 31403475.005

CLIENT: Briarcliff Manor UFSD

PROJECT SITE: ~~Briarcliff HS~~ Todd Elementary School

Project Manager: A. Smolyar

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

LOCATION(S) SURVEYED: Various Locations

PROPOSED PROJECT: Reconstruction

DATE(S) OF INSPECTION: 8/17/2021

Inspector(s): Stephen Gruber

BK0821371

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
A	01	Roof O	[Gypsum (white) under]		
↓	02	↓ M	[EPDM Roofing]		
B	03	Roof K	Petlite Insulation (tan)		Under Fiberboard / Steel / plywood deck
↓	04	↓	↓		3rd layer
↓	05	↓	↓		
C	06	↓	[Fiberboard (brown) under]		2nd layer (1st Layer)
↓	07	↓	[EPDM]		(EPDM)
D	08	Roof E	Vent Sealant (Gray)		
E	10	Roof G	Pitch Pocket Sealant		
↓	11	↓ L	(Black) (Gray)		
F	12	Roof G	Pitch pocket Sealant		
↓	13	↓ ↓	(Gray) (Black)		

CHAIN OF CUSTODY

Relinquished by: (print) <u>Stephen Gruber</u> (Sign) <u>[Signature]</u>	8/23/21 6:15 AM/PM	Relinquished by: (Sign) _____	AM/PM	Relinquished by: (Sign) _____	AM/PM
Received by: (print) <u>Natalia</u> (Sign) <u>[Signature]</u>	8/23/21 18:40 AM/PM	Received by: (Sign) _____	AM/PM	Received by: (Sign) _____	AM/PM

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

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 2 OF 6

PROJECT NO.: 31403475.005
CLIENT: Babalift Manor UFSD
PROJECT SITE: Todd Elementary School
Project Manager: A. Smolyar

LOCATION(S) SURVEYED: Various Locations
PROPOSED PROJECT: Reconstruction
DATE(S) OF INSPECTION: 8/19/2021
Inspector(s): Stephen Gruber

BK0821371

LOUIS BERGER
 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
G	14	Roof L	Gray Caulking at Metal		
↓	15	↓	Cap Flashing		
H	16	Room 217	Sink Undercoating (gray)		
↓	17	↓	↓		
I	18		[Brown Mastic assoc w		
↓	19		Cove base (2nd Layer)]		
J	20		[Creme adhesive assoc		
↓	21		w Cove base (1st Layer)]		
K	22		[Blue Cove base		
↓	23		↓ ↓ ↓		
L	24		[12"X12" White VFT		
↓	25		w Blue Spots]		

CHAIN OF CUSTODY

Relinquished by: (print) <u>J. Wang</u> (Sign) <u>[Signature]</u>	8/23/21 6:50 AM/PM	Relinquished by: (print) _____ (Sign) _____	AM/PM	Relinquished by: (print) _____ (Sign) _____	AM/PM
Received by: (print) <u>Antal</u> (Sign) <u>[Signature]</u>	8/23/21 18:40 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

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 3 OF 6

PROJECT NO.: 31403475.005
CLIENT: Brookliff Manor UFSD
PROJECT SITE: Todd Elementary School
Project Manager: A. Smolyar

LOCATION(S) SURVEYED: Various Locations
PROPOSED PROJECT: Reconstruction
DATE(S) OF INSPECTION: 8/19/2021
Inspector(s): Stephen Gruber

BK0821371

LOUIS BERGER
 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.

Alexander.Smolyar@wsp.com

☐ 48 HR. ☒ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
M	26	Room 217	[White Floor levelling compound] ^A		
↓	27	↓	[w yellow adhesive] ^B		
N	28	Mechanical Room 247	Acoustical ceiling		
↓	29	↓	Plaster (gray)		
↓	30	↓	↓		
○	31	↓	Ceiling Plaster Patches		
↓	32	↓	(white)		
↓	33	↓	↓		
P	34	↓	[Black Glue dots on]		
↓	35	↓	[Wall]		
Q	36	↓	Sealant (white) at		
↓	37	↓	pipe edges		

CHAIN OF CUSTODY

Relinquished by: (print) <u>STEPHEN GRUBER</u> (Sign) <u>[Signature]</u>	8/23/21 6:50 AM/PM	Relinquished by: (Sign) _____	_____	_____	Relinquished by: (print) _____ (Sign) _____	_____	_____	_____
Received by: (print) <u>Alexander Smolyar</u> (Sign) <u>[Signature]</u>	8/23/21 18:48 AM/PM	Received by: (Sign) _____	_____	_____	Received by: (print) _____ (Sign) _____	_____	_____	_____

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



ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 4 OF 6

PROJECT NO.: 314034-75.005
CLIENT: Brunelift Manor UFSD
PROJECT SITE: Todd Elementary School
Project Manager: A. Smolyar

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

LOCATION(S) SURVEYED: Various Locations
PROPOSED PROJECT: Reconstruction
DATE(S) OF INSPECTION: 8/19/2021
Inspector(s): Stephen Gruber

BK0821371

RESULTS TO: Lb.Labresults@wsp.com

TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR.

Alexander Smolyar @wsp.com

☐ 48 HR. ☒ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
Q	38	Mechanical Room 247	Sealant (white) at Pipe Edges		Fiberglass pipes
R	39	Exterior - Overhung by Room 124 Exit	[Cementitious Ceiling]		
↓	40	↓ ↓	(gray)		
S	41	Library 201	[Yellow mastic assoc w carpet Flooring]		
↓	42	↓ ↓			
T	43	Boys Toilet by Mail	[Mortar assoc w ceramic Floor Tiles]		
↓	44	Girls Toilet by Mail			
U	45	Boys Toilet by Mail	[Backing assoc w ceramic Wall tiles]		
↓	46	Girls Toilet by Mail			
V	47	Courtyard by Classroom 242	[White textured Paint]		
↓	48	↓ by Classroom 175			
W	49	Courtyard by classroom 242	Mortar at Cinderblock		

CHAIN OF CUSTODY

Relinquished by: (print) J. Wang	(Sign) <u>[Signature]</u>	8/23/21 6:15 AM	Relinquished by: (print)	(Sign)	/ /	AM/PM	Relinquished by: (print)	(Sign)	/ /	AM/PM
Received by: (print) [Signature]	(Sign) <u>[Signature]</u>	8/23/21 18:40 AM	Received by: (print)	(Sign)	/ /	AM/PM	Received by: (print)	(Sign)	/ /	AM/PM

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

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 5 OF 6

PROJECT NO.: 31403475.005
CLIENT: Bruchliff Manor UFSD
PROJECT SITE: Todd Elementary School
Project Manager: A. Smolyar

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

LOCATION(S) SURVEYED: Various Locations

PROPOSED PROJECT: Reconstruction

DATE(S) OF INSPECTION: 8/19/2021

Inspector(s): Stephen Gruber

BK0821371

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	50	Courtyard by classroom 175	Mortar at Cinderblock		
X	51	Courtyard by classroom 242	Window caulking (white)		
↓	52	↓ ↓ 175	↓ ↓		
Y	53	Stair 6 Courtyard	Expansion Joint Caulking		
↓	54		Brown (at wall)		
Z	55		Tar at Foundation wall		
↓	56		↓		
AA	57		Beige door Frame Caulking		
↓	58		↓ ↓		
			Gray sealant on brick		
			at Wall Joint		
AB	59		Expansion Joint Caulking (gray) at wall		

CHAIN OF CUSTODY

Relinquished by: (print) J. Wang	(Sign)	8/23/21	6:50 AM	Relinquished by: (print) Stephen Gruber	(Sign)		/	/	AM/PM
Received by: (print) A. Smolyar	(Sign)	8/23/21	12:40 PM	Received by: (print) Stephen Gruber	(Sign)		/	/	AM/PM

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

ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY

PAGE 6 OF 6

PROJECT NO.: 31403475.005

CLIENT: Briardiff Manor UFSD

PROJECT SITE: Todd Elementary School

Project Manager: A. Smolyar

LOUIS BERGER

TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341

ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014

LOCATION(S) SURVEYED: Various Locations

PROPOSED PROJECT: Reconstruction

DATE(S) OF INSPECTION: 8/19/2021

Inspector(s): Stephen Gruber

BK0821371

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
AB	60	Expansion Joint Cawling			
AB	60	Stair 6 Courtyard	Expansion Joint Cawling (gray) at wall		
AC	61	Courtyard by Classroom 245	Window Frame Cawling		
↓	62	↓	(Gray)		
AD	63	Courtyard by Classroom	Stone Sill cawling		
↓	64	175	(Creme)		
AE	65	Exterior - Kindergarten Courtyard	[Gray door frame]		Wooden Trim
↓	66	↓	[Cawling]		
AF	67	Stair 6 Courtyard	[Fiberglass at Floor]		Concrete Floor Join
↓	68	↓	(Black)		
AG	69	Classroom 110	[2'x4' suspended]		
↓	70	↓	[Cawling Tiles]		

CHAIN OF CUSTODY

Relinquished by: (print) J. Wang	(Sign)	8/23/21	6:50 AM	Relinquished by: (print) [blank]	(Sign) [blank]	/ /	AM/PM	Relinquished by: (print) [blank]	(Sign) [blank]	/ /	AM/PM
Received by: (print) Antulias	(Sign)	8/23/21	18:40 AM	Received by: (print) [blank]	(Sign) [blank]	/ /	AM/PM	Received by: (print) [blank]	(Sign) [blank]	/ /	AM/PM

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



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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
Collected by: Client
Project Name/No.: Briarcliff CSD / 31403475.005
Project Address: Todd Elementary School; 45 Inghum Rd, Briarcliff Manor NY 10510
Work Area:

Lab ID: BK0821467
Date Received: 8/30/2021
PLM Date Analyzed: 8/31/2021
TEM Date Analyzed: 9/1/2021
Report Date: 9/2/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	AI%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
AH71	BK0821467-1	Corridor 258 Adjacent Room 232 - Cementitious Window Sill (Black)	Black, Homogeneous, Non-Fibrous	18.6	3.5	77.8	0%	100%	NAD Inconclusive	NAD
AH72	BK0821467-2	Corridor 254 Adjacent Room 241 - Cementitious Window Sill (Black)	Black, Homogeneous, Non-Fibrous	94.2	3.1	2.6	0%	100%	NAD Inconclusive	NAD
AI73	BK0821467-3	Corridor 260 - Cementitious Window Sill (White)	White, Homogeneous, Friable	Not Applicable			0%	97%	33%CHRY	
AI74	BK0821467-4	Corridor 260 - Cementitious Window Sill (White)	White, Homogeneous, Friable	Not Applicable					NA/PS	
AJ75	BK0821467-5	Corridor Adj Room 227 - Black Mastic Associated with 12"x12" White VFT with Brown Spots	Black, Homogeneous, Non-Fibrous	61.6	14.2	24.2	0%	100%	NAD Inconclusive	NAD
AJ76	BK0821467-6	Corridor 260 - Black Mastic Associated with 12"x12" White VFT with Brown Spots	Black, Homogeneous, Non-Fibrous	80.3	5.8	13.9	0%	100%	NAD Inconclusive	NAD
AK77	BK0821467-7	Corridor Adj Room 227 - 12"x12" White VFT with Brown Spots	Grey, Homogeneous, Non-Fibrous	18.0	3.7	78.3	0%	100%	NAD Inconclusive	NAD
AK78	BK0821467-8	Corridor 260 - 12"x12" White VFT with Brown Spots	Grey, Homogeneous, Non-Fibrous	19.3	7.0	73.6	0%	100%	NAD Inconclusive	NAD
AL79	BK0821467-9	Library 201 - Sealant (Beige) at Brick Expansion Joint	Beige, Homogeneous, Non-Fibrous	36.4	13.1	50.5	0%	97.4%	2.6%CHRY	Not Analyzed
AL80	BK0821467-10	Library 201 - Sealant (Beige) at Brick Expansion Joint	Beige, Homogeneous, Non-Fibrous	35.7	13.2	51.1			NA/PS	Not Analyzed



Atlas Environmental Lab, Corp.
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 Phone:(212) 563-0400 Fax:(212) 563-0401
 www.atlasenvironmentallab.com

Bulk Asbestos Report by PLM-TEM

Client: WSP
Collected by: Client
Project Name/No.: Briarcliff CSD / 31403475.005
Project Address: Todd Elementary School; 45 Ingham Rd, Briarcliff Manor NY 10510
Work Area:

Lab ID: BK0821467
Date Received: 8/30/2021
PLM Date Analyzed: 8/31/2021
TEM Date Analyzed: 9/1/2021
Report Date: 9/2/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
AM81	BK0821467-11	Library 201 - Joint Compound (White) associated with Gypsum Board	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AM82	BK0821467-12	Library 201 - Joint Compound (White) associated with Gypsum Board	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AN83	BK0821467-13	Library 201 - Gypsum Board (White)	Grey/Brown, Homogeneous, Friable	Not Applicable			5%CELL 5%FBGL	90%	NAD	
AN83	BK0821467-14	Closet Near Mail Room - Gypsum Board (White)	Grey/Brown, Homogeneous, Friable	Not Applicable			5%CELL	95%	NAD	
AO85	BK0821467-15	Boys Adj Room 201 - Backing (Greyish/White) Associated with Ceramic Wall Tiles	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AO86	BK0821467-16	Boys Adj Room 201 - Backing (Greyish/White) Associated with Ceramic Wall Tiles	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AP87	BK0821467-17	Boys Adj Room 201 - Grout (White) Associated with Ceramic Wall Tiles	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AO88	BK0821467-18	Boys Adj Room 201 - Grout (White) Associated with Ceramic Wall Tiles	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AQ89	BK0821467-19	Corridor 130 - 12"x12" Grey with Spots Vinyl Floor Tiles	Grey, Homogeneous, Non-Fibrous	22.2	14.6	63.3	0%	100%	NAD Inconclusive	NAD
AQ90	BK0821467-20	Corridor 130 - 12"x12" Grey with Spots Vinyl Floor Tiles	Grey, Homogeneous, Non-Fibrous	22.7	13.8	63.6	0%	100%	NAD Inconclusive	NAD



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Client: WSP
Collected by: Client
Project Name/No.: Briarcliff CSD / 31403475.005
Project Address: Todd Elementary School; 45 Ingham Rd, Briarcliff Manor NY 10510
Work Area:

Lab ID: BK0821467
Date Received: 8/30/2021
PLM Date Analyzed: 8/31/2021
TEM Date Analyzed: 9/1/2021
Report Date: 9/2/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
AR91	BK0821467-21	Corridor 130 - Black Mastic Associated with 12"x12" Grey with Spots VFT	Black, Homogeneous, Non-Fibrous	27.0	23.0	50.0	0%	100%	NAD Inconclusive	NAD
AR92	BK0821467-22	Corridor 130 - Black Mastic Associated with 12"x12" Grey with Spots VFT	Black, Homogeneous, Non-Fibrous	29.5	19.8	50.7	0%	100%	NAD Inconclusive	NAD
AS93	BK0821467-23	Corridor Adj Room 220 - Black Cove Base (6")	Black, Homogeneous, Non-Fibrous	45.7	2.4	51.9	0%	100%	NAD Inconclusive	NAD
AS94	BK0821467-24	Corridor Adj Room 227 - Black Cove Base (6")	Black, Homogeneous, Non-Fibrous	46.9	3.3	49.8	0%	100%	NAD Inconclusive	NAD
AT95	BK0821467-25	Corridor Adj Room 220 -Grey Mastic Associated with Black Cove Base (6")	Yellow, Homogeneous, Non-Fibrous	36.0	31.4	32.6	0%	100%	NAD Inconclusive	NAD
AT96	BK0821467-26	Corridor Adj Room 227 -Grey Mastic Associated with Black Cove Base (6")	Yellow, Homogeneous, Non-Fibrous	28.2	10.2	61.7	0%	100%	NAD Inconclusive	NAD
AU97	BK0821467-27	Lobby 100 - Wall Plaster (Brown Coat)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AU98	BK0821467-28	Nurse 103 - Wall Plaster (Brown Coat)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AU99	BK0821467-29	Nurse 103 - Wall Plaster (Brown Coat)	Beige, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AV100	BK0821467-30	Lobby 100 - Wall Plaster (White Coat)	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	



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Client: WSP
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Project Name/No.: Briarcliff CSD / 31403475.005
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Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
AV101	BK0821467-31	Nurse 103- Wall Plaster (White Coat)	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AV102	BK0821467-32	Nurse 103 - Toilet - Wall Plaster (White Coat)	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AW103	BK0821467-33	Nurse 103- Toilet - Ceiling Plaster (Brown Coat)	Grey, Homogeneous, Friable	Not Applicable			5%FOAM	95%	NAD	
AW104	BK0821467-34	Girls Toilet by Lobby 100 - Ceiling Plaster (Brown Coat)	Grey, Homogeneous, Friable	Not Applicable			5%FOAM	95%	NAD	
AW105	BK0821467-35	Girls Toilet by Lobby 100 - Ceiling Plaster (Brown Coat)	Grey, Homogeneous, Friable	Not Applicable			5%FOAM	95%	NAD	
AX106	BK0821467-36	Nurse 103 - Toilet - Ceiling Plaster (White Coat)	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AX107	BK0821467-37	Girls Toilet by Lobby 100 - Ceiling Plaster (White Coat)	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AX108	BK0821467-38	Girls Toilet by Lobby 100 - Ceiling Plaster (White Coat)	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AY109	BK0821467-39	Nurse Toilet - Mortar (Gray) at Ceramic Floor Tiles	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AY110	BK0821467-40	Nurse Toilet - Mortar (Gray) at Ceramic Floor Tiles	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	



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Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
AZ111	BK0821467-41	Girls Toilet by Lobby 100 - Backing (Gray) associated with Ceramic Wall Tiles	Beige, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
AZ112	BK0821467-42	Girls Toilet by Lobby 100 - Backing (Gray) associated with Ceramic Wall Tiles	Beige, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
BA113	BK0821467-43	Nurse Toilet - Grout (White) associated with Ceramic Wall Tiles	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
BA114	BK0821467-44	Nurse Toilet - Grout (White) associated with Ceramic Wall Tiles	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
BB115	BK0821467-45	Exterior - A Wing by Lobby 160 - Gypsum Board (Brown)	Tan, Homogeneous, Friable	Not Applicable			5%FBGL	95%	NAD	
BB116	BK0821467-46	Exterior - A Wing by Lobby 160 - Gypsum Board (Brown)	Tan, Homogeneous, Friable	Not Applicable			5%FBGL	95%	NAD	
BC117	BK0821467-47	Exterior - A Wing by Lobby 160 - Joint Compound Associated with Gypsum Board (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
BC118	BK0821467-48	Exterior - A Wing by Lobby 160 - Joint Compound Associated with Gypsum Board (White)	White, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
BD119	BK0821467-49	Exterior - Stair 6 Courtyard - Brick Mortar (Gray)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	
BD120	BK0821467-50	Exterior - North - Brick Mortar (Gray)	Grey, Homogeneous, Friable	Not Applicable			0%	100%	NAD	



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Bulk Asbestos Report by PLM-TEM

Client: WSP
Collected by: Client
Project Name/No.: Briarcliff CSD / 31403475.005
Project Address: Todd Elementary School; 45 Ingham Rd, Briarcliff Manor NY 10510
Work Area:

Lab ID: BK0821467
Date Received: 8/30/2021
PLM Date Analyzed: 8/31/2021
TEM Date Analyzed: 9/1/2021
Report Date: 9/2/2021

Client ID#	Lab ID#	Description/ Location	Analyst Description	ORG%	All%	ASI%	PLM			TEM
							Fibrous%	Non Fibrous%	Asbestos% &Type	Asbestos% &Type
BE121	BK0821467-51	Exterior - By Classroom 123 - Louver Caulking	Grey, Homogeneous, Non-Fibrous	56.2	23.6	20.2	0%	100%	NAD Inconclusive	NAD
BE122	BK0821467-52	Exterior - By Classroom 234 - (Gray)	Grey, Homogeneous, Non-Fibrous	50.3	29.7	20.1	0%	100%	NAD Inconclusive	NAD

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=Anthophyllite, 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%, All= 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, CT Reg. ID: PH-0154

PLM Analyst: AS

TEM Analyst: VR

Approved by:



ASBESTOS SURVEY DATA SHEET / CHAIN OF CUSTODY

PAGE 1 OF 5

PROJECT NO.: 31403475005
 CLIENT: Bracecliff Manor U.S.P. CAPIS ID#: —
 PROJECT SITE: Todd Elementary School
 PROJECT ADDRESS: 45 Ingham Rd, Bracecliff Manor NY 10510

DATE(S) OF INSPECTION: 8-27-2021
 Project Manager: A. Smolyar
 Inspector(s)/Investigator(s): STEPHEN GRUBER NICHOLAS CASALE

LOUIS BERGER dba WSP USA Solutions, Inc.
 TELEPHONE NO.: (212) 612-7900
 ADDRESS: 96 Morton Street 8th Floor, New York, NY 10014

Alexander Smolyar @wsp.com
 RESULTS TO: joseph.garcia@wsp.com
prakash.saha@wsp.com labresults@wsp.com
 TURNAROUND TIME: ☐ 12 HR. ☐ 24 HR. ☐ 48 HR. ☒ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	Conditions Good/Fair/Poor	Friable Yes/No	FIELD NOTES
1 AH	71	Corridor 258 adjacent Rm 232	Cementitious Window				
2 ↓	72	Corridor 258 adjacent Rm 241	Sill (Black)				
3 AI	73	Corridor 260	Cementitious Window				
4 ↓	74		Sill (White)				
5 AJ	75	Corridor adj Rm 227	Black mastie assoc w				
6 ↓	76	Corridor 260	12'x12" White VFT w Brown spots				
7 AK	77	Corridor adj Rm 227	12'x12" White VFT				
8 ↓	78	Corridor 260	↓ w Brown spots				
9 AL	79	Library 201	Sealant (beige) at				
10 ↓	80		Brick expansion Joint				
11 AM	81		Joint compound (white)				
12 ↓	82		assoc w Gypsum Board				

CHAIN OF CUSTODY

Relinquished by: (print) <u>STEPHEN GRUBER</u>	(Sign) <u>[Signature]</u>	<u>08/30/2021</u>	<u>7:00</u> AM/PM	Relinquished by: (print)	(Sign)	<u>1</u>	<u>1</u>	AM/PM	Relinquished by: (print)	(Sign)	<u>1</u>	<u>1</u>	AM/PM
Received by: (print) <u>Prakash Saha</u>	(Sign) <u>[Signature]</u>	<u>08/30/21</u>	<u>7:00</u> AM/PM	Received by: (print)	(Sign)	<u>1</u>	<u>1</u>	AM/PM	Received by: (print)	(Sign)	<u>1</u>	<u>1</u>	AM/PM

General Notes: All inconclusive NOBs to be analyzed by TEM. Please stop at 1st positive in any homogeneous group.



ASBESTOS SURVEY DATA SHEET / CHAIN OF CUSTODY

PAGE 2 OF 5

PROJECT NO.: 31403475.005
 CLIENT: Bourcliff Manor ^{VPSP} CAPIS ID#: #
 PROJECT SITE: Todd Elementary School
 PROJECT ADDRESS: 45 Ingham Rd, Bourcliff Manor
NY 10510

LOUIS BERGER dba WSP USA Solutions, Inc.
 TELEPHONE NO.: (212) 612-7900
 ADDRESS: 96 Morton Street 8th Floor, New York, NY 10014

DATE(S) OF INSPECTION: 8-27-2021
 Project Manager: A. Smolyar
 Inspector(s)/Investigator(s): STEPHEN GRUBER ^{NICHOLAS CASALE}
 RESULTS TO: Alexander Smolyar @wsp.com
justin.garcia@wsp.com
prakash.saha@wsp.com 60196 results @wsp.com
 TURNAROUND TIME:
☐ 12 HR. ☐ 24 HR. ☐ 48 HR. ☒ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	Conditions Good/Fair/Poor	Friable Yes/No	FIELD NOTES
13 AN	83	Library 201	Gypsum Board (white)				
14 ↓	84	closet near Mail Room	↓				
15 AO	85	Boys adl Rm 201	Backing (grayish/white) assoc.				
16 ↓	86		w ceramic wall tiles				
17 AP	87		Grout (white) assoc				
18 ↓	88		w ceramic wall tiles				
19 AQ	89	Corridor 130	[12"X12" Grey w spots]				
20 ↓	90		[Vinyl Floor Tiles]				
21 AR	91		[Black mastic assoc w]				
22 ↓	92		[12"X12" Grey w spots VFT]				
23 AS	93	Corridor adl Rm 220	[Black Cove base]				
24 ↓	94	Corridor adl Rm 227	[6"]				

CHAIN OF CUSTODY

Relinquished by: (print) <u>STEPHEN GRUBER</u>	(Sign) <u>[Signature]</u>	<u>08/30/2021</u>	Relinquished by: (print) <u>[Signature]</u>	(Sign) <u>[Signature]</u>	<u>11</u>	Relinquished by: (print) <u>[Signature]</u>	(Sign) <u>[Signature]</u>	<u>08/30/21</u>
Received by: (print) <u>Melamonty</u>	(Sign) <u>No</u>	<u>8/30/21</u>	Received by: (print) <u>[Signature]</u>	(Sign) <u>[Signature]</u>	<u>11</u>	Received by: (print) <u>[Signature]</u>	(Sign) <u>[Signature]</u>	<u>08/30/21</u>

General Notes: All inconclusive NOBs to be analyzed by TEM. Please stop at 1st positive in any homogeneous group.



ASBESTOS SURVEY DATA SHEET / CHAIN OF CUSTODY

PAGE 3 OF 5

PROJECT NO.: 314 03475.005
 CLIENT: Burdett Manor UFSO CAPIS ID#: #
 PROJECT SITE: Todd Elementary School
 PROJECT ADDRESS: 45 Ingham Rd, Burdett Manor

DATE(S) OF INSPECTION: 8-27-2021
 Project Manager: A. Smolyar
 Inspector(s)/Investigator(s): STEPHEN GRUBER, MICHAEL CASALE

LOUIS BERGER dba WSP USA Solutions, Inc.
 TELEPHONE NO.: (212) 612-7900
 ADDRESS: 96 Morton Street 8th Floor, New York, NY 10014

Alexander Smolyar @wsp.com
 RESULTS TO: josue.garcia@wsp.com;
 prakash.saha@wsp.com

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

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	Conditions Good/Fair/Poor	Friable Yes/No	FIELD NOTES
25	AT 95	Corridor adj 220 Rm	Gray mastic associated				
26	↓ 96	Corridor adj 227 Rm	w black Cove base (6")				
27	AV 97	Lobby 100	Wall plaster (Brown coat)				
28	↓ 98	Nurse 103	↓				
29	↓ 99	↓	↓				
30	AV 100	Lobby 100	Wall Plaster (white coat)				
31	↓ 101	Nurse 103	↓				
32	↓ 102	↓ - Toilet	↓				
33	AW 103	Nurse 103-Toilet	Ceiling Plaster (Brown coat)				
34	↓ 104	Girls Toilet by Lobby 100	↓				
35	↓ 105	↓	↓				
36	AX 106	Nurse 103-Toilet	Ceiling Plaster (white coat)				

CHAIN OF CUSTODY

Relinquished by: (print) <u>STEPHEN GRUBER</u>	(Sign) <u>[Signature]</u>	8/30/2021	70	Relinquished by: (print)	(Sign)	AMPM	Relinquished by: (print)	(Sign)	AMPM
Received by: (print) <u>Michael Casale</u>	(Sign) <u>[Signature]</u>	8/30/21	7:38	Received by: (print)	(Sign)	AMPM	Received by: (print)	(Sign)	AMPM

General Notes: All inconclusive NOBs to be analyzed by TEM. Please stop at 1st positive in any homogeneous group.



ASBESTOS SURVEY DATA SHEET / CHAIN OF CUSTODY

PAGE 4 OF 5

PROJECT NO.: 31403475.005

CLIENT: Brarcliff Manor JFS CAPIS ID#: #

PROJECT SITE: Todd Elementary School

PROJECT ADDRESS: 45 Ingham Rd, Brarcliff Manor

LOUIS BERGER dba WSP USA Solutions, Inc.
TELEPHONE NO.: (212) 612-7900
ADDRESS: 96 Morton Street 8th Floor, New York, NY 10014

NY 10510

DATE(S) OF INSPECTION: 8-27-2021

Project Manager: As Smolyar

Inspector(s)/Investigator(s): STEPHEN GUNBEN; NICHOLAS CASALE

Alexander Smolyar @wsp.com

RESULTS TO: jesue.garcia@wsp.com

prakash.saha@wsp.com

260146results@wsp.com

TURNAROUND TIME:

☐ 12 HR. ☐ 24 HR. ☐ 48 HR. ☒ 72 HR.

HA	SAMPLE NO.	SAMPLE LOCATION	MATERIAL DESCRIPTION	APPROX. QUANTITY (LF/SF)	Conditions Good/Fair/Poor	Friable Yes/No	FIELD NOTES
37 AX	107	Girls Toilet by Lobby 100	Ceiling Plaster (white coat)				
38 ↓	108	↓	↓				
39 AY	109	Nurse Toilet	[Mortar (gray) at				
40 ↓	110	↓	Ceramic Floor tiles]				
41 AZ	111	Girls Toilet by Lobby 100	Backing (gray) assoc w				
42 ↓	112	↓	Ceramic wall tiles				
43 BA	113	Nurse Toilet	Grout (white) assoc				
44 ↓	114	↓	w Ceramic wall tiles				
45 BB	115	Exterior - Awning by Lobby 160	Gypsum Board (Brown)				
46 ↓	116	↓	↓				
47 BC	117	↓	Joint Compound assoc				
48 ↓	118	↓	w Gypsum Board (White)				

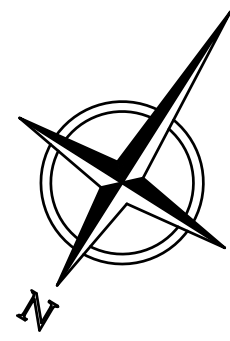
CHAIN OF CUSTODY

Relinquished by: (print) <u>STEPHEN GUNBEN</u>	(Sign) <u>[Signature]</u>	<u>8/30/2021</u>	Relinquished by: (print) <u>[Signature]</u>	(Sign) <u>[Signature]</u>	<u>11/11/2021</u>	Relinquished by: (print) <u>[Signature]</u>	(Sign) <u>[Signature]</u>	<u>11/11/2021</u>	Relinquished by: (print) <u>[Signature]</u>	(Sign) <u>[Signature]</u>	<u>11/11/2021</u>
Received by: (print) <u>Relaxation</u>	(Sign) <u>[Signature]</u>	<u>8/30/21</u>	Received by: (print) <u>[Signature]</u>	(Sign) <u>[Signature]</u>	<u>11/11/2021</u>	Received by: (print) <u>[Signature]</u>	(Sign) <u>[Signature]</u>	<u>11/11/2021</u>	Received by: (print) <u>[Signature]</u>	(Sign) <u>[Signature]</u>	<u>11/11/2021</u>

General Notes: All inconclusive NOBs to be analyzed by TEM. Please stop at 1st positive in any homogeneous group.



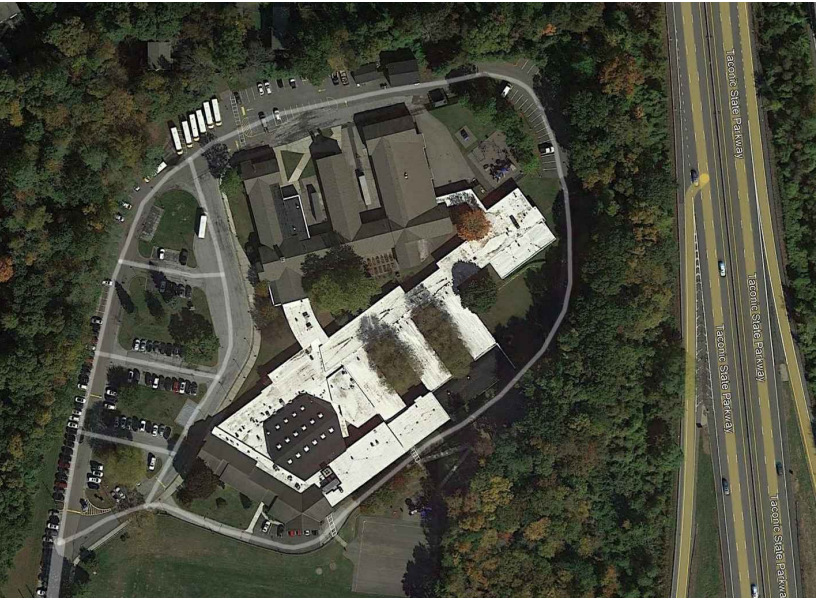
**APPENDIX C:
ASBESTOS BULK SAMPLE LOCATION DRAWINGS**



**BRIARCLIFF MANOR UNION
FREE SCHOOL DISTRICT**

**45 INGHAM ROAD
BRIARCLIFF MANOR, NY
10510**

LOCATION PLAN
NTS



ENVIRONMENTAL CONSULTANT



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

**TODD ELEMENTARY SCHOOL
45 INGHAM RD,
BRIARCLIFF MANOR, NY 10510**

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

**CONSULTANT SERVICES FOR
PHASE 1, 2 & 3 PROJECT
SURVEY & DESIGN SERVICE**

TODD ELEMENTARY SCHOOL

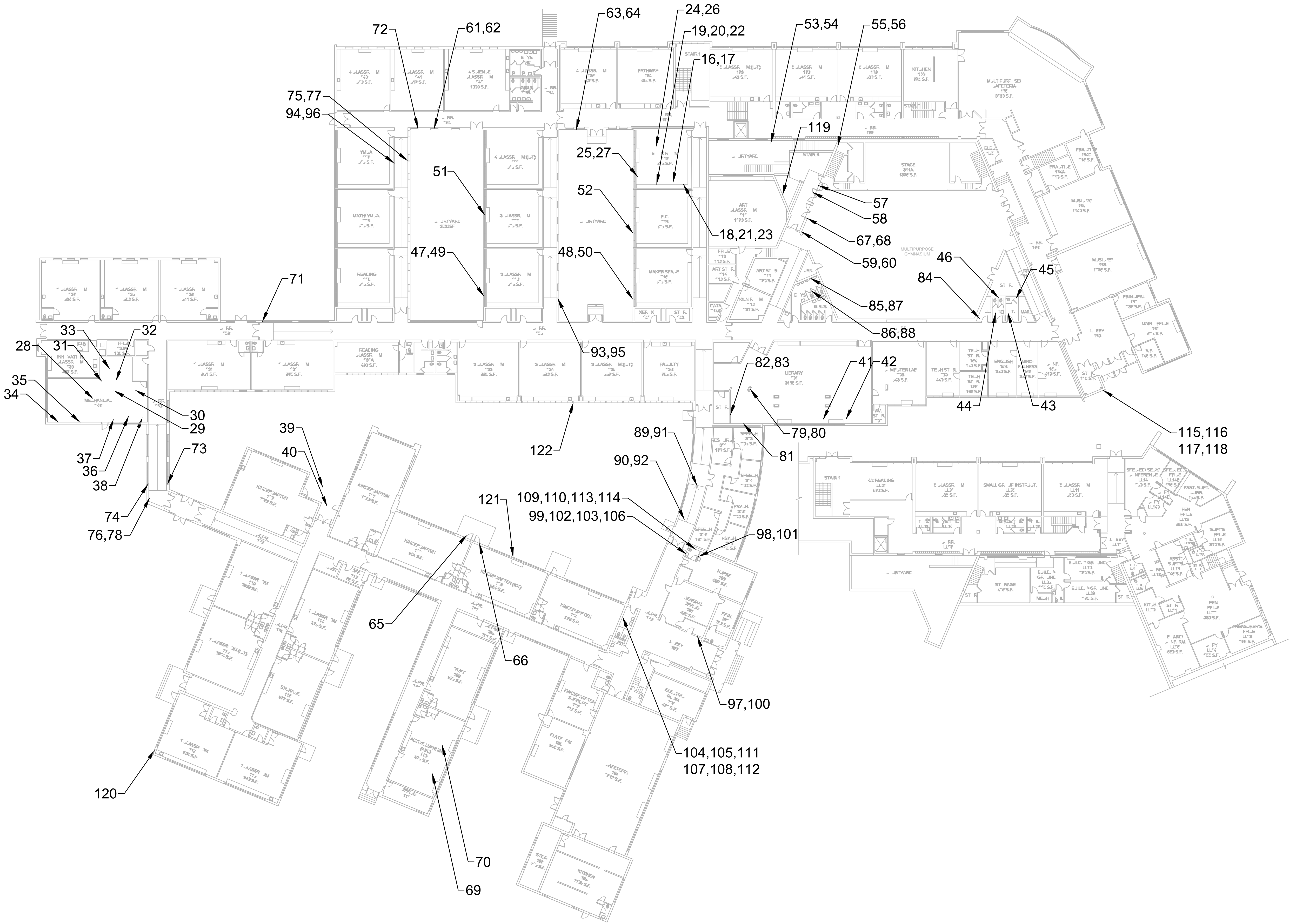
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**BULK SAMPLE LOCATION PLAN
FIRST FLOOR**

DRAWN BY:	J. LIU	SCALE:	NOT TO SCALE
INSP/INV.	S. GRUBER	DATE:	09/10/2021
CERTIFICATE NO.	17-42557	DRAWING NUMBER:	
CHECKED BY:	A. SMOLYAR		

BSL001

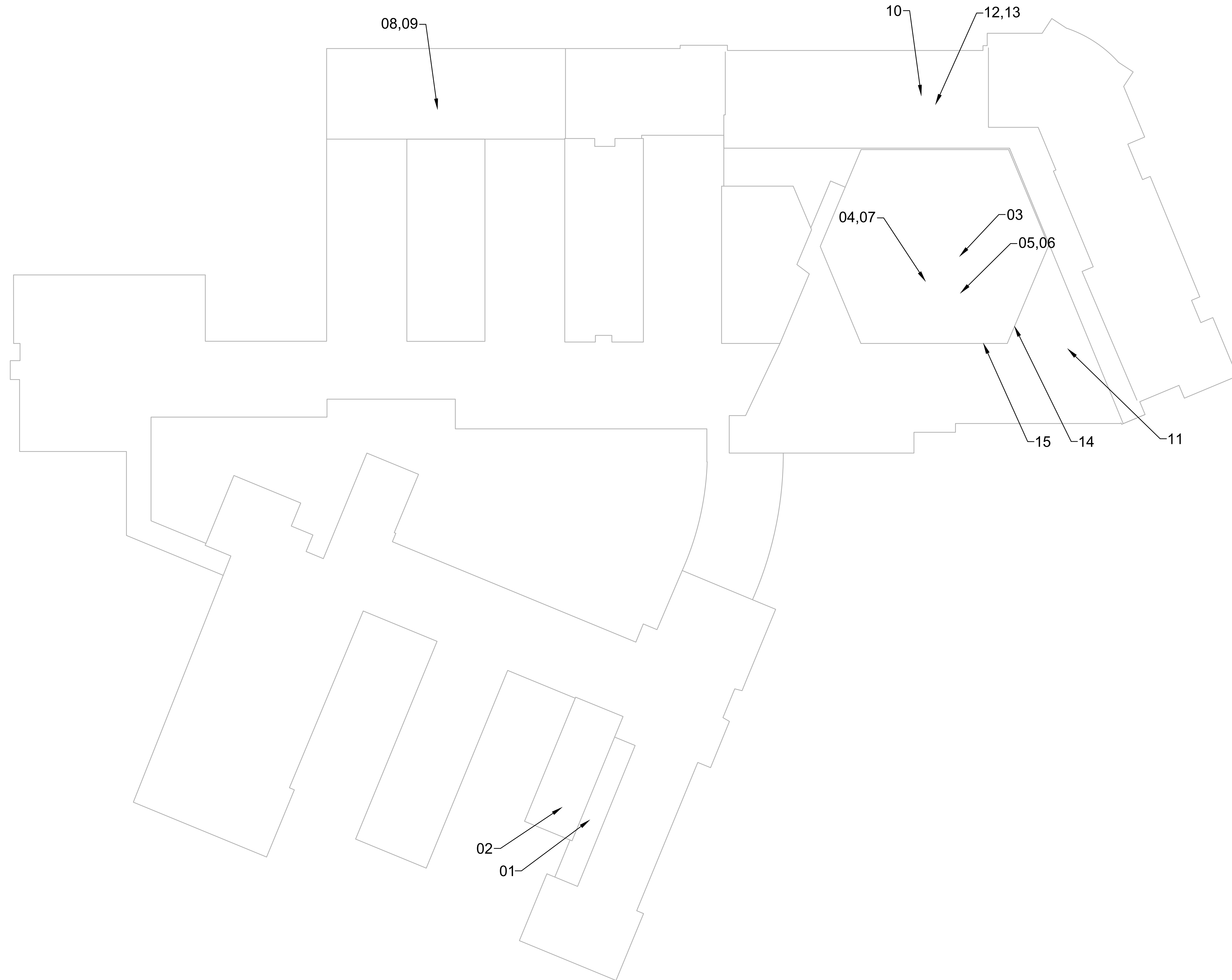
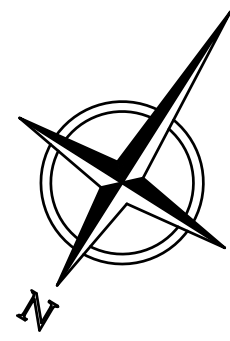
DRAWING NUMBER:
1 OF 2



1

BULK SAMPLE LOCATION PLAN - FIRST FLOOR

SCALE: NOT TO SCALE



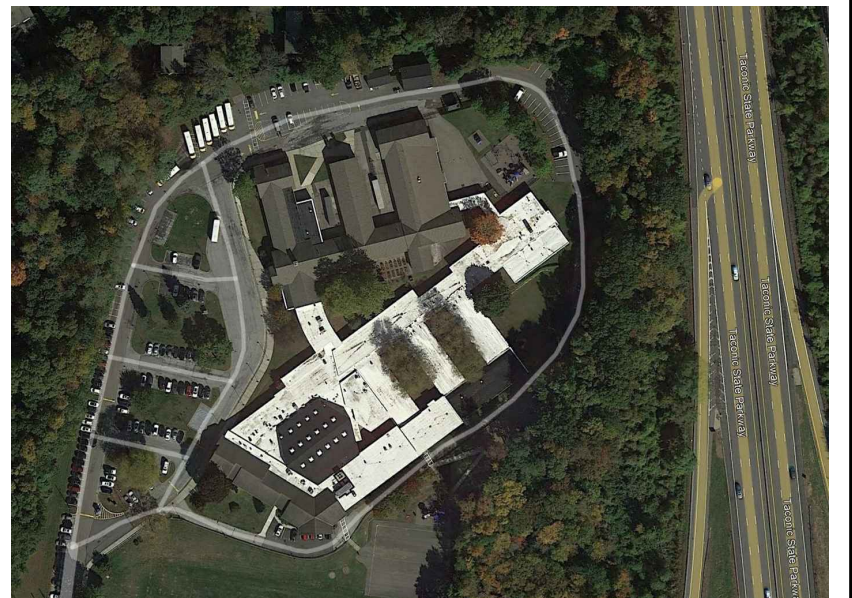
1 **BULK SAMPLE LOCATION PLAN - ROOF**
SCALE: NOT TO SCALE



**BRIARCLIFF MANOR UNION
FREE SCHOOL DISTRICT**

**45 INGHAM ROAD
BRIARCLIFF MANOR, NY
10510**

LOCATION PLAN
NTS



ENVIRONMENTAL CONSULTANT



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

**TODD ELEMENTARY SCHOOL
45 INGHAM RD,
BRIARCLIFF MANOR, NY 10510**

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

**CONSULTANT SERVICES FOR
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SURVEY & DESIGN SERVICE**

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DRAWING TITLE:

**BULK SAMPLE LOCATION PLAN
ROOF**

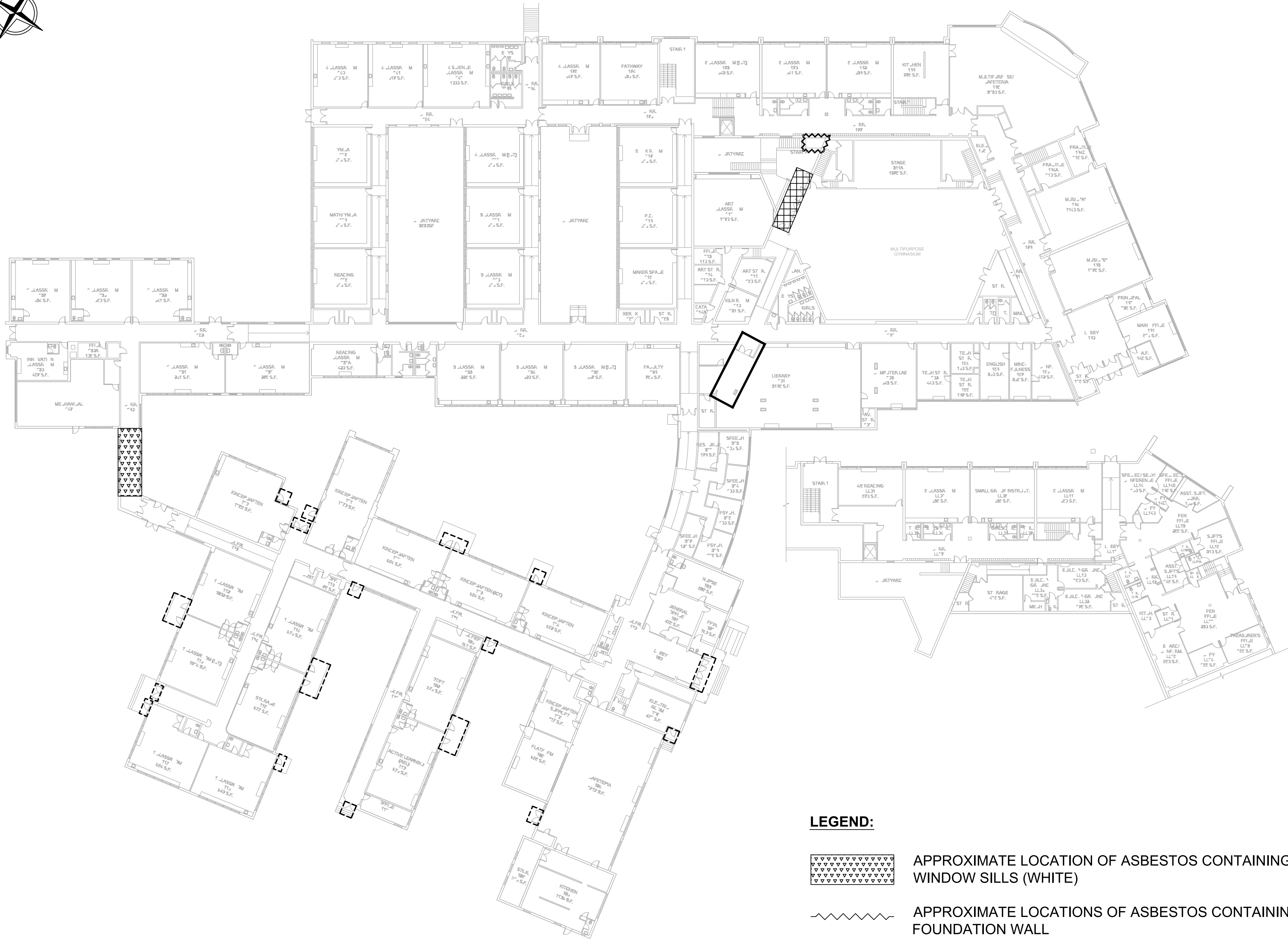
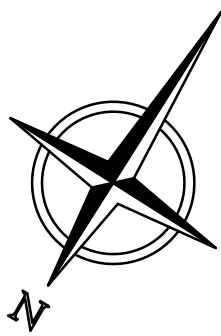
DRAWN BY: J. LIU	SCALE: NOT TO SCALE
INSP/INV. S. GRUBER	DATE: 09/10/2021
CERTIFICATE NO. 17-42557	DRAWING NUMBER:
CHECKED BY: A. SMOLYAR	

BSL002

DRAWING NUMBER:
2 OF 2

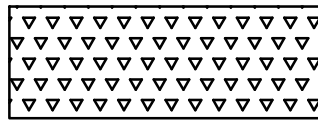


**APPENDIX D:
ASBESTOS CONTAINING MATERIALS LOCATION
DRAWINGS**



1 **ACM LOCATION PLAN - FIRST FLOOR**
SCALE: NOT TO SCALE

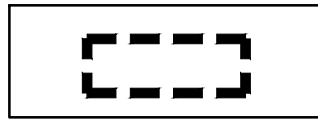
LEGEND:



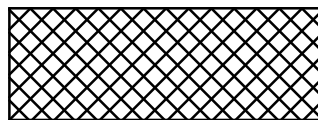
APPROXIMATE LOCATION OF ASBESTOS CONTAINING CEMENTITIOUS WINDOW SILLS (WHITE)



APPROXIMATE LOCATIONS OF ASBESTOS CONTAINING TAR AT FOUNDATION WALL



APPROXIMATE LOCATIONS OF ASBESTOS CONTAINING WOOD DOOR FRAME CAULKING (GRAY)



APPROXIMATE LOCATION OF ASBESTOS CONTAINING DOOR FRAME CAULKING (BEIGE) AND EXPANSION JOINT CAULKING (GRAY)



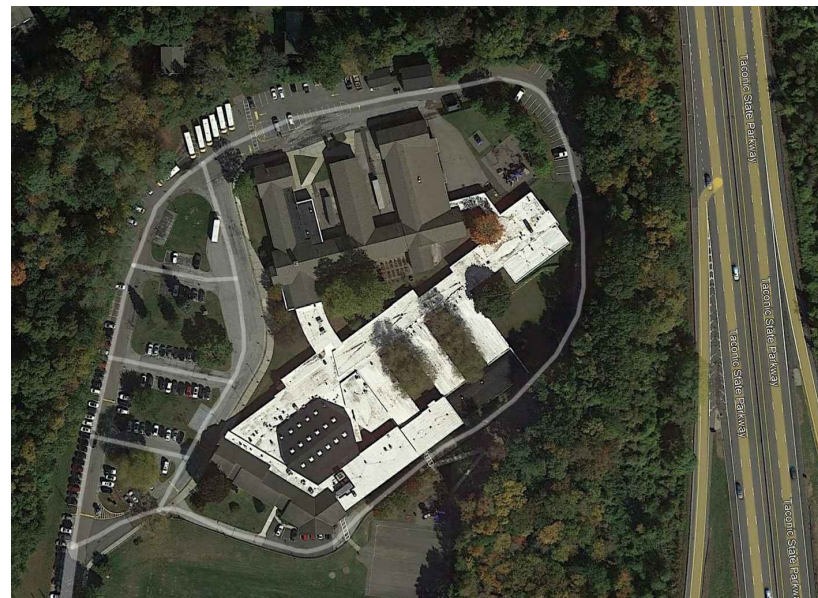
APPROXIMATE LOCATION OF ASBESTOS CONTAINING SEALANT (GRAY) AT BRICK EXPANSION JOINT



**BRIARCLIFF MANOR UNION
FREE SCHOOL DISTRICT**

**45 INGHAM ROAD
BRIARCLIFF MANOR, NY
10510**

LOCATION PLAN
NTS



ENVIRONMENTAL CONSULTANT



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

**TODD ELEMENTARY SCHOOL
45 INGHAM RD,
BRIARCLIFF MANOR, NY 10510**

REVISIONS:

NUMBER	DESCRIPTION	DATE
1		
2		
3		
4		

**CONSULTANT SERVICES FOR
PHASE 1, 2 & 3 PROJECT
SURVEY & DESIGN SERVICE**

TODD ELEMENTARY SCHOOL

DRAWING TITLE:

**ACM LOCATION PLAN
FIRST FLOOR**

DRAWN BY:	J. LIU	SCALE:	NOT TO SCALE
INSP/INV.	S. GRUBER	DATE:	09/10/2021
CERTIFICATE NO.	17-42557	DRAWING NUMBER:	
CHECKED BY:	A. SMOLYAR		

ACM001

DRAWING NUMBER:
1 OF 1



**APPENDIX E:
LEAD XRF SHOT RESULTS**

WSP		XRF CALIBRATION CHECK FORM			PAGE <u>1</u> OF <u>4</u>	
PROJ. NO.:		31403475.005		DATE:		8/27/21
PROJECT NAME:		Reconstruction		INSPECTOR NAME:		N. Casale & S. Grube
CLIENT:		Briarcliff SD		INSPECTOR SIGNATURE:		<i>[Signature]</i>
SITE:		Todd Elementary		PROJ. MANAGER:		A. Smolyar
<small>WSP USA Solutions Inc. TELEPHONE #: (212) 612-7900 FAX #: (212) 425-1618 ADDRESS: 96 Morton Street, 8th Floor, New York, NY 10014</small>		XRF MAKE/MODEL:		LLW#:		JOB#:
		RMD LPA-1 (Serial#3675) Heuresis Pb200i (Serial#2150)				08271219
NOTES:						
CALIBRATION CHECK – PRIOR TO LEAVING OFFICE						
1.0 mg/cm ² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE	
CALIBRATION TIME: 8:50 AM	TEST #	1	2	3		
	XRF READING	1.0	1.0	1.1		
CALIBRATION CHECK – PRIOR TO LEAVING OFFICE						
0.0 mg/cm ² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE	
CALIBRATION TIME: 8:55 AM	TEST #	4	5	6		
	XRF READING	0.1	0.2	-0.1		
CALIBRATION CHECK – FIELD-START End						
1.0 mg/cm ² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE	
CALIBRATION TIME: 12:03 PM	TEST #	61	62	63		
	XRF READING	1.1	1.1	1.1		
CALIBRATION CHECK – FIELD-END /2-HR (circle one)						
0.0 mg/cm ² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE	
CALIBRATION TIME: 12:06 PM	TEST #	64	65	66		
	XRF READING	0.2	0.1	0.1		
CALIBRATION CHECK – FIELD-END/2-HR (circle one)						
mg/cm ² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE	
CALIBRATION TIME: _____	TEST #					
	XRF READING					
CALIBRATION CHECK – FIELD-END/2-HR (circle one)						
mg/cm ² Calibration Block		FIRST READING	SECOND READING	THIRD READING	AVERAGE	
CALIBRATION TIME: _____	TEST #					
	XRF READING					
CALIBRATION CHECK – FIELD-END/2-HR (circle one)						
mg/cm ² 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 2 OF 4

PROJECT NO.: _____

PROJECT NAME: _____

PA1 - #3675
PB2001 - #2158

CLIENT: _____

PROJECT LOCATION: Todd Ekm.INSPECTOR(S): S. Gruber, N. CasaleINSPECTION DATE: 8/27/21PROJ. MANAGER: A. Smelyar

SPACE CHARACTERISTICS:

FLOOR #: _____ ROOM #: _____ ROOM NAME: _____

NOTES:

LLW#: _____

JOB#: _____

SAMPLE #	SUBSTRATE	COMPONENT DESCRIPTION										XRF READING (mg/cm ²)
		COLOR	CONDITION (I/F/P)	COMPONENT	WALL/SIDE DESIGN.	SIDE (L/C/R)	HEIGHT (L/M/U)	COMPONENT TREPLICANT	QUANTITY (IF POSITIVE) [SF]	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	
7	M PL S C CB PG CR B W V CT G FG OTHER:	Red		Ext. Door Fr.	A B C D RM CTR FL CL						Mens Bath by 156	0.2
8	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
9	M PL S C CB PG CR B W V CT G FG OTHER:	Grey		Door Frame	A B C D RM CTR FL CL							1-6
10	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
11	M PL S C CB PG CR B W V CT G FG OTHER:	White		Upper Wall	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:	Red		Rad. Cover	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		I-Beam	A B C D RM CTR FL CL							3.2
14	M PL S C CB PG CR B W V CT G FG OTHER:	↓		Ceiling	A B C D RM CTR FL CL							1.8
15	M PL S C CB PG CR B W V CT G FG OTHER:	White		Conduit	A B C D RM CTR FL CL							0.5
16	M PL S C CB PG CR B W V CT G FG OTHER:	↓		↓	A B C D RM CTR FL CL							0.4
17	M PL S C CB PG CR B W V CT G FG OTHER:	White		Rad. Cover	A B C D RM CTR FL CL						Women's Bathroom by 156	0.2
18	M PL S C CB PG CR B W V CT G FG OTHER:	White		Shelves	A B C D RM CTR FL CL						Mail room by 156	0.3
19	M PL S C CB PG CR B W V CT G FG OTHER:	Tan		I-Beam	A B C D RM CTR FL CL						Closet Across from 155	2.9
20	M PL S C CB PG CR B W V CT G FG OTHER:	↓		Ceiling	A B C D RM CTR FL CL						↓	3.2
21	M PL S C CB PG CR B W V CT G FG OTHER:	White		Ceiling	A B C D RM CTR FL CL						Storage Room in 209	1.6
22	M PL S C CB PG CR B W V CT G FG OTHER:	Tan		Wall	A B C D RM CTR FL CL						Library 201	0.2
23	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							0.2
24	M PL S C CB PG CR B W V CT G FG OTHER:	White		Rad. Cover	A B C D RM CTR FL CL							0.1
25	M PL S C CB PG CR B W V CT G FG OTHER:	Tan		Column	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							

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

PAGE 3 OF 4

PROJECT NO.: _____

PROJECT NAME: _____

LPA1 - #3675
PB2001 - #2150

CLIENT: _____

PROJECT LOCATION: Todd. Elem.

INSPECTOR(S): N. Casale, S. Gruber

PROJ. MANAGER: A. Smolyar

INSPECTION DATE: 8/27/21

SPACE CHARACTERISTICS:

FLOOR #: _____ ROOM #: _____ ROOM NAME: _____

NOTES:

LLW#: _____

JOB#: _____

SAMPLE #	SUBSTRATE	COMPONENT DESCRIPTION										XRF READING (mg/cm²)
		COLOR	CONDITION [I/F/P]	COMPONENT	WALL/SIDE DESIGN.	SIDE [L/C/R]	HEIGHT [L/M/U]	COMPONENT TREPICANT	QUANTITY (IF POSITIVE) [SF]	PHOTO	NOTES (DETERIORATION TO FRICTION/IMPACT AND/OR MOISTURE?)	
26	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	Yellow		Wall	A B C D RM CTR FL CL						Hall outside of Special Services	0.2
27	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	Red		Handrail	A B C D RM CTR FL CL							0.0
28	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	↓		Door	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: <u>✓</u>	Yellow		Wall	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: <u>✓</u>	White		Wall	A B C D RM CTR FL CL						General Office	-0.4
31	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	Red		Wall Trim	A B C D RM CTR FL CL						Nurses office	0.1
32	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	Red		Door Frame	A B C D RM CTR FL CL						Nurse's Bathroom	0.3
33	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	↓		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: <u>✓</u>	Yellow		Wall	A B C D RM CTR FL CL							0.0
35	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	Red		Window Frame	A B C D RM CTR FL CL						Hall outside General Office	-0.1
36	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	beige		Door Frame	A B C D RM CTR FL CL						General Office Mail Room	0.4
37	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	Blue		Door	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: <u>✓</u>	Varnish		Window Frame	A B C D RM CTR FL CL						General Office	0.1
39	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	White		Door Frame	A B C D RM CTR FL CL						Large Courtyard	1.3
40	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	Blue		Baseboard	A B C D RM CTR FL CL						Corridor 133	0.1
41	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	Yellow		Rail Cover	A B C D RM CTR FL CL							0.2
42	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	Black		Baseboard	A B C D RM CTR FL CL							0.0
43	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	Yellow		Corkboard	A B C D RM CTR FL CL						Hall by 232	0.1
44	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	↓		Window	A B C D RM CTR FL CL						Hall by 225	0.2
45	M PL S C CB PG CR B W V CT G FG OTHER: <u>✓</u>	↓		Window Frame	A B C D RM CTR FL CL							0.0

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

PAGE 4 OF 4

PROJECT NO.: _____

PROJECT NAME: _____

LPA1 - #3675

RB2001 - #2150

CLIENT: _____

PROJECT LOCATION: Todd Elem.INSPECTOR(S): N. Casale, S. GruberPROJ. MANAGER: A. SmolyarINSPECTION DATE: 8/27/21

SPACE CHARACTERISTICS:

FLOOR #: _____

ROOM #: _____

ROOM NAME: _____

NOTES:

LLW#: _____

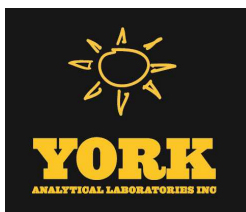
JOB#: _____

SAMPLE #	SUBSTRATE	COMPONENT DESCRIPTION										XRF READING (mg/cm ²)
		COLOR	CONDITION (I/F/P)	COMPONENT	WALL/SID E DESIGN.	SIDE (L/C/R)	HEIGHT (L/M/U)	COMPONENT TREPLICANT	QUANTITY (IF POSITIVE) (SF)	PHOTO	NOTES (DETERIORATIO N TO FRICTION/IMPAC T AND/OR MOISTURE?)	
46	M PL S C CB PG CR B W V CT G FG OTHER: _____	Yellow		Lower Wall	A B C D RM CTR FL CL				Hall by 225			0.2
47	M PL S C CB PG CR B W V CT G FG OTHER: _____	Red		Column	A B C D RM CTR FL CL				↓			0.5
48	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				Small Courtyard			0.2
49	M PL S C CB PG CR B W V CT G FG OTHER: _____	Tan		Wall	A B C D RM CTR FL CL				↓			0.0
50	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
51	M PL S C CB PG CR B W V CT G FG OTHER: _____	Yellow		Wall	A B C D RM CTR FL CL				Hall Outside Small Courtyard			0.0
52	M PL S C CB PG CR B W V CT G FG OTHER: _____	Blue		Door Frame	A B C D RM CTR FL CL				Book Room 217			0.6
53	M PL S C CB PG CR B W V CT G FG OTHER: _____	Blue		Wall	A B C D RM CTR FL CL				↓			0.0
54	M PL S C CB PG CR B W V CT G FG OTHER: _____	↓		Rad. Cover	A B C D RM CTR FL CL				↓			0.2
55	M PL S C CB PG CR B W V CT G FG OTHER: _____	Red		Door	A B C D RM CTR FL CL				Gym Courtyard			0.1
56	M PL S C CB PG CR B W V CT G FG OTHER: _____	Red		Door Frame	A B C D RM CTR FL CL				↓			0.3
57	M PL S C CB PG CR B W V CT G FG OTHER: _____	White		Awning	A B C D RM CTR FL CL				↓			1.5
58	M PL S C CB PG CR B W V CT G FG OTHER: _____	Blue		Door Frame	A B C D RM CTR FL CL				↓			0.4
59	M PL S C CB PG CR B W V CT G FG OTHER: _____	Black		Stairs	A B C D RM CTR FL CL				↓			0.1
60	M PL S C CB PG CR B W V CT G FG OTHER: _____	Red		Floor	A B C D RM CTR FL CL				Mech. Room			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: Sink, 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 Solutions Inc. (New York, NY)

96 Morton Street, 8th Floor

New York NY, 10014

Attention: Alexander Smolyar

Report Date: 09/02/2021

Client Project ID: 31403475.005

York Project (SDG) No.: 21H1493

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
www.YORKLAB.com

STRATFORD, CT 06615
(203) 325-1371

132-02 89th AVENUE
FAX (203) 357-0166

RICHMOND HILL, NY 11418
ClientServices@yorklab.com

Report Date: 09/02/2021
Client Project ID: 31403475.005
York Project (SDG) No.: 21H1493

WSP USA Solutions Inc. (New York, NY)
96 Morton Street, 8th Floor
New York NY, 10014
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 30, 2021 and listed below. The project was identified as your project: **31403475.005**.

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.

<u>York Sample ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>
21H1493-01	A-01/02/03	Caulk	08/19/2021	08/30/2021
21H1493-02	B-04/05/06	Caulk	08/19/2021	08/30/2021
21H1493-03	C-07/08/09	Caulk	08/19/2021	08/30/2021
21H1493-04	D-10/11/12	Caulk	08/19/2021	08/30/2021
21H1493-05	E-13/14/15	Caulk	08/19/2021	08/30/2021
21H1493-06	F-16/17/18	Caulk	08/19/2021	08/30/2021
21H1493-07	G-19/20/21	Caulk	08/19/2021	08/30/2021
21H1493-08	H-22/23/24	Caulk	08/19/2021	08/30/2021
21H1493-09	I-25/26/27	Caulk	08/27/2021	08/30/2021

General Notes for York Project (SDG) No.: 21H1493

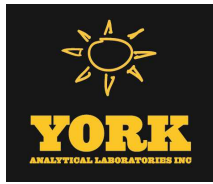
1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
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: 09/02/2021

Cassie L. Mosher
Laboratory Manager





Sample Information

Client Sample ID: A-01/02/03

York Sample ID: 21H1493-01

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

21H1493

31403475.005

Caulk

August 19, 2021 3:00 pm

08/30/2021

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	0.407	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:35	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.407	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:35	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.407	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:35	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.407	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:35	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.407	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:35	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.407	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:35	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.407	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:35	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.407	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 19:35	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.407	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 19:35	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.407	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 19:35	BJ
Surrogate Recoveries		Result	Acceptance Range							
877-09-8	Surrogate: Tetrachloro-m-xylene	84.5 %	30-140							
2051-24-3	Surrogate: Decachlorobiphenyl	59.5 %	30-140							

Sample Information

Client Sample ID: B-04/05/06

York Sample ID: 21H1493-02

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

21H1493

31403475.005

Caulk

August 19, 2021 3:00 pm

08/30/2021

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	0.382	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:49	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.382	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:49	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.382	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:49	BJ



Sample Information

Client Sample ID: B-04/05/06

York Sample ID: 21H1493-02

York Project (SDG) No.
21H1493

Client Project ID
31403475.005

Matrix
Caulk

Collection Date/Time
August 19, 2021 3:00 pm

Date Received
08/30/2021

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	0.382	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:49	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.382	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:49	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.382	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:49	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.382	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 19:49	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.382	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 19:49	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.382	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 19:49	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.382	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 19:49	BJ
Surrogate Recoveries		Result		Acceptance Range						
877-09-8	Surrogate: Tetrachloro-m-xylene	85.0 %		30-140						
2051-24-3	Surrogate: Decachlorobiphenyl	61.5 %		30-140						

Sample Information

Client Sample ID: C-07/08/09

York Sample ID: 21H1493-03

York Project (SDG) No.
21H1493

Client Project ID
31403475.005

Matrix
Caulk

Collection Date/Time
August 19, 2021 3:00 pm

Date Received
08/30/2021

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	0.342	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:02	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.342	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:02	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.342	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:02	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.342	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:02	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.342	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:02	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.342	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:02	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.342	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:02	BJ



Sample Information

Client Sample ID: C-07/08/09

York Sample ID: 21H1493-03

York Project (SDG) No.
21H1493

Client Project ID
31403475.005

Matrix
Caulk

Collection Date/Time
August 19, 2021 3:00 pm

Date Received
08/30/2021

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	0.342	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 20:02	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.342	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 20:02	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.342	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 20:02	BJ
Surrogate Recoveries		Result		Acceptance Range						
877-09-8	Surrogate: Tetrachloro-m-xylene	67.0 %		30-140						
2051-24-3	Surrogate: Decachlorobiphenyl	50.5 %		30-140						

Sample Information

Client Sample ID: D-10/11/12

York Sample ID: 21H1493-04

York Project (SDG) No.
21H1493

Client Project ID
31403475.005

Matrix
Caulk

Collection Date/Time
August 19, 2021 3:00 pm

Date Received
08/30/2021

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	0.347	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:16	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.347	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:16	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.347	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:16	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.347	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:16	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.347	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:16	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.347	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:16	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.347	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:16	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.347	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 20:16	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.347	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 20:16	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.347	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 20:16	BJ
Surrogate Recoveries		Result		Acceptance Range						
877-09-8	Surrogate: Tetrachloro-m-xylene	74.0 %		30-140						
2051-24-3	Surrogate: Decachlorobiphenyl	53.5 %		30-140						



Sample Information

Client Sample ID: D-10/11/12

York Sample ID: 21H1493-04

<u>York Project (SDG) No.</u> 21H1493	<u>Client Project ID</u> 31403475.005	<u>Matrix</u> Caulk	<u>Collection Date/Time</u> August 19, 2021 3:00 pm	<u>Date Received</u> 08/30/2021
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Sample Information

Client Sample ID: E-13/14/15

York Sample ID: 21H1493-05

<u>York Project (SDG) No.</u> 21H1493	<u>Client Project ID</u> 31403475.005	<u>Matrix</u> Caulk	<u>Collection Date/Time</u> August 19, 2021 3:00 pm	<u>Date Received</u> 08/30/2021
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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	0.316	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:30	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.316	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:30	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.316	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:30	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.316	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:30	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.316	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:30	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.316	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:30	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.316	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:30	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.316	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 20:30	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.316	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 20:30	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.316	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 20:30	BJ
Surrogate Recoveries		Result		Acceptance Range						
877-09-8	Surrogate: Tetrachloro-m-xylene	84.0 %		30-140						
2051-24-3	Surrogate: Decachlorobiphenyl	64.0 %		30-140						

Sample Information

Client Sample ID: F-16/17/18

York Sample ID: 21H1493-06

<u>York Project (SDG) No.</u> 21H1493	<u>Client Project ID</u> 31403475.005	<u>Matrix</u> Caulk	<u>Collection Date/Time</u> August 19, 2021 3:00 pm	<u>Date Received</u> 08/30/2021
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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
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@		



Sample Information

Client Sample ID: F-16/17/18

York Sample ID: 21H1493-06

York Project (SDG) No.
21H1493

Client Project ID
31403475.005

Matrix
Caulk

Collection Date/Time
August 19, 2021 3:00 pm

Date Received
08/30/2021

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	0.355	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:43	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.355	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:43	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.355	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:43	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.355	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:43	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.355	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:43	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.355	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:43	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.355	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:43	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.355	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 20:43	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.355	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 20:43	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.355	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 20:43	BJ
Surrogate Recoveries		Result	Acceptance Range							
877-09-8	Surrogate: Tetrachloro-m-xylene	96.0 %	30-140							
2051-24-3	Surrogate: Decachlorobiphenyl	64.5 %	30-140							

Sample Information

Client Sample ID: G-19/20/21

York Sample ID: 21H1493-07

York Project (SDG) No.
21H1493

Client Project ID
31403475.005

Matrix
Caulk

Collection Date/Time
August 19, 2021 3:00 pm

Date Received
08/30/2021

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	0.427	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:57	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:57	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:57	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:57	BJ



Sample Information

Client Sample ID: G-19/20/21

York Sample ID: 21H1493-07

York Project (SDG) No.
21H1493

Client Project ID
31403475.005

Matrix
Caulk

Collection Date/Time
August 19, 2021 3:00 pm

Date Received
08/30/2021

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
12672-29-6	Aroclor 1248	ND		mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:57	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:57	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 20:57	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 20:57	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.427	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 20:57	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.427	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 20:57	BJ
Surrogate Recoveries		Result		Acceptance Range						
877-09-8	Surrogate: Tetrachloro-m-xylene	86.0 %		30-140						
2051-24-3	Surrogate: Decachlorobiphenyl	60.5 %		30-140						

Sample Information

Client Sample ID: H-22/23/24

York Sample ID: 21H1493-08

York Project (SDG) No.
21H1493

Client Project ID
31403475.005

Matrix
Caulk

Collection Date/Time
August 19, 2021 3:00 pm

Date Received
08/30/2021

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	0.362	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 21:10	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.362	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 21:10	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.362	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 21:10	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.362	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 21:10	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.362	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 21:10	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.362	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 21:10	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.362	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 12:54	09/01/2021 21:10	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.362	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 21:10	BJ



Sample Information

Client Sample ID: H-22/23/24

York Sample ID: 21H1493-08

York Project (SDG) No.
21H1493

Client Project ID
31403475.005

Matrix
Caulk

Collection Date/Time
August 19, 2021 3:00 pm

Date Received
08/30/2021

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
11100-14-4	Aroclor 1268	ND		mg/kg	0.362	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 12:54	09/01/2021 21:10	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.362	1	EPA 8082A Certifications:	08/31/2021 12:54	09/01/2021 21:10	BJ
Surrogate Recoveries		Result		Acceptance Range						
877-09-8	Surrogate: Tetrachloro-m-xylene	95.5 %		30-140						
2051-24-3	Surrogate: Decachlorobiphenyl	65.5 %		30-140						

Sample Information

Client Sample ID: I-25/26/27

York Sample ID: 21H1493-09

York Project (SDG) No.
21H1493

Client Project ID
31403475.005

Matrix
Caulk

Collection Date/Time
August 27, 2021 3:00 pm

Date Received
08/30/2021

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	0.382	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:58	BJ
11104-28-2	Aroclor 1221	ND		mg/kg	0.382	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:58	BJ
11141-16-5	Aroclor 1232	ND		mg/kg	0.382	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:58	BJ
53469-21-9	Aroclor 1242	ND		mg/kg	0.382	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:58	BJ
12672-29-6	Aroclor 1248	ND		mg/kg	0.382	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:58	BJ
11097-69-1	Aroclor 1254	ND		mg/kg	0.382	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:58	BJ
11096-82-5	Aroclor 1260	ND		mg/kg	0.382	1	EPA 8082A Certifications: NELAC-NY10854,CTDOH,NJDEP	08/31/2021 13:07	09/02/2021 03:58	BJ
37324-23-5	Aroclor 1262	ND		mg/kg	0.382	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 13:07	09/02/2021 03:58	BJ
11100-14-4	Aroclor 1268	ND		mg/kg	0.382	1	EPA 8082A Certifications: NELAC-NY10854,NJDEP	08/31/2021 13:07	09/02/2021 03:58	BJ
1336-36-3	* Total PCBs	ND		mg/kg	0.382	1	EPA 8082A Certifications:	08/31/2021 13:07	09/02/2021 03:58	BJ
Surrogate Recoveries		Result		Acceptance Range						
877-09-8	Surrogate: Tetrachloro-m-xylene	75.0 %		30-140						
2051-24-3	Surrogate: Decachlorobiphenyl	53.0 %		30-140						



Analytical Batch Summary

Batch ID: BH11755

Preparation Method: EPA 3550C

Prepared By: EMS

YORK Sample ID	Client Sample ID	Preparation Date
21H1493-01	A-01/02/03	08/31/21
21H1493-02	B-04/05/06	08/31/21
21H1493-03	C-07/08/09	08/31/21
21H1493-04	D-10/11/12	08/31/21
21H1493-05	E-13/14/15	08/31/21
21H1493-06	F-16/17/18	08/31/21
21H1493-07	G-19/20/21	08/31/21
21H1493-08	H-22/23/24	08/31/21
BH11755-BLK1	Blank	08/31/21
BH11755-BS1	LCS	08/31/21
BH11755-BSD1	LCS Dup	08/31/21

Batch ID: BH11758

Preparation Method: EPA 3550C

Prepared By: EMS

YORK Sample ID	Client Sample ID	Preparation Date
21H1493-09	I-25/26/27	08/31/21
BH11758-BLK1	Blank	08/31/21
BH11758-BS1	LCS	08/31/21
BH11758-BSD1	LCS Dup	08/31/21



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
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Batch BH11755 - EPA 3550C

Blank (BH11755-BLK1)

Prepared: 08/31/2021 Analyzed: 09/01/2021

Aroclor 1016	ND	0.0166	mg/kg								
Aroclor 1221	ND	0.0166	"								
Aroclor 1232	ND	0.0166	"								
Aroclor 1242	ND	0.0166	"								
Aroclor 1248	ND	0.0166	"								
Aroclor 1254	ND	0.0166	"								
Aroclor 1260	ND	0.0166	"								
Aroclor 1262	ND	0.0166	"								
Aroclor 1268	ND	0.0166	"								
Total PCBs	ND	0.0166	"								
Surrogate: Tetrachloro-m-xylene	0.0601		"	0.0664		90.5	30-140				
Surrogate: Decachlorobiphenyl	0.0385		"	0.0664		58.0	30-140				

LCS (BH11755-BS1)

Prepared: 08/31/2021 Analyzed: 09/01/2021

Aroclor 1016	0.359	0.0166	mg/kg	0.332		108	40-130				
Aroclor 1260	0.342	0.0166	"	0.332		103	40-130				
Surrogate: Tetrachloro-m-xylene	0.0571		"	0.0664		86.0	30-140				
Surrogate: Decachlorobiphenyl	0.0382		"	0.0664		57.5	30-140				

LCS Dup (BH11755-BSD1)

Prepared: 08/31/2021 Analyzed: 09/01/2021

Aroclor 1016	0.360	0.0166	mg/kg	0.332		108	40-130	0.333	25		
Aroclor 1260	0.341	0.0166	"	0.332		103	40-130	0.545	25		
Surrogate: Tetrachloro-m-xylene	0.0575		"	0.0664		86.5	30-140				
Surrogate: Decachlorobiphenyl	0.0379		"	0.0664		57.0	30-140				

Batch BH11758 - EPA 3550C

Blank (BH11758-BLK1)

Prepared: 08/31/2021 Analyzed: 09/02/2021

Aroclor 1016	ND	0.0166	mg/kg								
Aroclor 1221	ND	0.0166	"								
Aroclor 1232	ND	0.0166	"								
Aroclor 1242	ND	0.0166	"								
Aroclor 1248	ND	0.0166	"								
Aroclor 1254	ND	0.0166	"								
Aroclor 1260	ND	0.0166	"								
Aroclor 1262	ND	0.0166	"								
Aroclor 1268	ND	0.0166	"								
Total PCBs	ND	0.0166	"								
Surrogate: Tetrachloro-m-xylene	0.0508		"	0.0664		76.5	30-140				
Surrogate: Decachlorobiphenyl	0.0355		"	0.0664		53.5	30-140				



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
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Batch BH11758 - EPA 3550C

LCS (BH11758-BS1)

Prepared: 08/31/2021 Analyzed: 09/02/2021

Aroclor 1016	0.327	0.0166	mg/kg	0.332		98.4	40-130				
Aroclor 1260	0.301	0.0166	"	0.332		90.6	40-130				
Surrogate: Tetrachloro-m-xylene	0.0542		"	0.0664		81.5	30-140				
Surrogate: Decachlorobiphenyl	0.0336		"	0.0664		50.5	30-140				

LCS Dup (BH11758-BSD1)

Prepared: 08/31/2021 Analyzed: 09/02/2021

Aroclor 1016	0.317	0.0166	mg/kg	0.332		95.5	40-130	2.99	25		
Aroclor 1260	0.300	0.0166	"	0.332		90.3	40-130	0.354	25		
Surrogate: Tetrachloro-m-xylene	0.0528		"	0.0664		79.5	30-140				
Surrogate: Decachlorobiphenyl	0.0349		"	0.0664		52.5	30-140				

Batch Y110210 - BH11681

Aroclor Reference (Y110210-ARC1)

Prepared & Analyzed: 09/01/2021

Surrogate: Tetrachloro-m-xylene	0.179		ug/mL	0.200		89.5					
Surrogate: Decachlorobiphenyl	0.144		"	0.200		72.0					



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

PAGE 1 OF 3

21H1493

WSP PROJ #: 31403475.005
 CLIENT: Brardiff Manor VSPD
 Project Site: Todd Elementary School
 Project Manager: A. Smolyar

LOCATION(S) SURVEYED: Various Locations
 PROPOSED PROJECT: Reconstruction
 DATE(S) OF INSPECTION: 8/14/2021
 Inspector(s): Stephen Gruber

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

RESULTS TO: labresults@wsp.com
alexander.smolyar@wsp.com

TURNAROUND TIME: ☒ 1 WEEK
☐ 48 HR ☐ 72 HR ☐ 96 HR ☐ 120 HR

LAB SAMPLE NO.	HA	SAMPLE NO.	MATERIAL DESCRIPTION	SAMPLE LOCATION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
A 01			Gray Caulking at	Roof L		
↓		02	↓ Metal cap Flashing	↓		
↓		03	↓			
B 04			Stainless Brown Expansion	Star 6 Courtyard		At wall
↓		05	Join Caulking	↓		
↓		06	↓			
C 07			Gray Expansion Join	↓		
↓		08	Caulking	↓		
↓		09	↓			
D 10			Beige Door Frame	↓		
↓		11	Caulking	↓		
↓		12	↓			

CHAIN OF CUSTODY

Shed by: <u>STEPHEN GRUBER</u> (Sign)	8/30/21	Relinquished by: <u>FRANCESCO</u> (print)	8/30/21	18:00 AM/PM	Relinquished by: <u>FRANCESCO</u> (print)	8/30/21	1928 AD/PM
Received by: <u>FRANCESCO</u> (Sign)	8/30/21	Received by: <u>K. BLODGETT</u> (print)	8/30/21	AM/PM	Received by: <u>K. BLODGETT</u> (print)	8/30/21	1928 AD/PM

PAGE 2 OF 3

2141493

LOCATION(S) SURVEYED

PROPOSED PROJECT: Reconstruction

DATE(S) OF INSPECTION: 8/19/2021

Inspector(s) Stephen Girber

RESULTS TO:

TURNAROUND TIME: ~~1~~ 1 WEEK

☐ 48 HR ☐ 72 HR ☐ 96 HR ☐ 120 HR

LAB SAMPLE NO.	HA	SAMPLE NO.	MATERIAL DESCRIPTION	SAMPLE LOCATION	APPROX. QUANTITY (LF/SF)	FIELD NOTES
	E	13	White Window Caulking	Courtyard by Classroom 175		
	I	14	↓	↓		
	↓	15	↓	↓ Classroom 242		
	F	16	Gray Window Frame	Courtyard by Classroom		
	I	17	Caulking	242		
	↓	18	↓	↓		
	G	19	Crepe Stone Joint	Courtyard by Classroom		
	I	20	Caulking	175		
	↓	21	↓			
	H	22	Gray door Frame	Kindergarten Courtyard		wed Trim
	I	23	Caulking	↓		
	↓	24	↓			

1,600

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Relinquished by:

202 (Sign)

8.2.11

Relinquished by

(Sign)

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82

Sign)

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Received by:

(Sign)

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Received by:

(Sign)

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128

Page 16 of 17

LAB INSTRUCTIONS: create one (1) composite sample of each homogeneous material from equal mass portions ($\pm 5\%$) of the three (3) sub-samples for extraction and analysis via EPA Method 8082 and report the Aroclors 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

WSP PROJ #: 31403475.005

CLIENT: Broadbent Major VFSD

Project Site: Todd Elementary School

Project Manager: A Smolyar

WSP

TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341

ADDRESS: 96 Morton Street, 8 Floor, New York, NY 10014

SAMPLE
NO.

 \overline{HA}

NO.	SAMPLE
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100	100

MATERIAL DESCRIPTION

5225

Grimy Lower Flange

Exterior qadi Rm 123

92-7-8

Car/buy

→ →

1782

→

✓ Rm 234



**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.
8th Floor
96 Morton Street
New York, NY 10014

FILE NUMBER:
LICENSE NUMBER: 132876
LICENSE CLASS: RESTRICTED
DATE OF ISSUE: 03/31/2021
EXPIRATION DATE: 03/31/2022

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

United States Environmental Protection Agency

This is to certify that

Nicholas S Casale



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 September 24, 2022

John Gorman, Chief

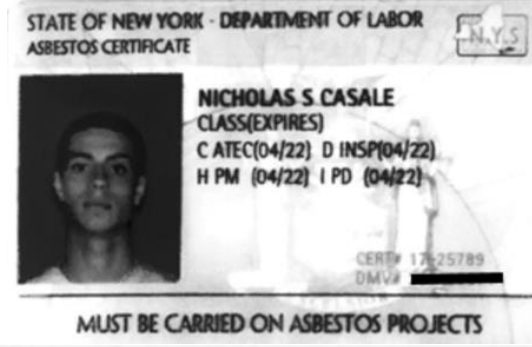
Pesticides & Toxic Substances Branch

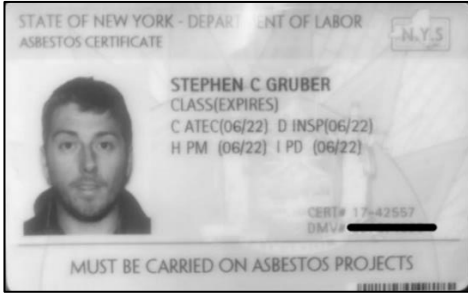
LBP-I-1207478-1

Certification #

September 10, 2019

Issued On





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-1219874-1

Certification #

November 28, 2020

Issued On



Ben Conetta

Ben Conetta, Chief

Chemicals and Multimedia Programs Branch

**NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER**



Expires 12:01 AM April 01, 2022
Issued April 01, 2021

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.: 63260

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



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 Communiqué dated January 2009).*

2020-10-01 through 2021-09-30
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

<input checked="" type="checkbox"/>	INDUSTRIAL HYGIENE	Accreditation Expires: August 01, 2023
<input checked="" type="checkbox"/>	ENVIRONMENTAL LEAD	Accreditation Expires: August 01, 2023
<input checked="" type="checkbox"/>	ENVIRONMENTAL MICROBIOLOGY	Accreditation Expires: August 01, 2023
<input type="checkbox"/>	FOOD	Accreditation Expires:
<input type="checkbox"/>	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

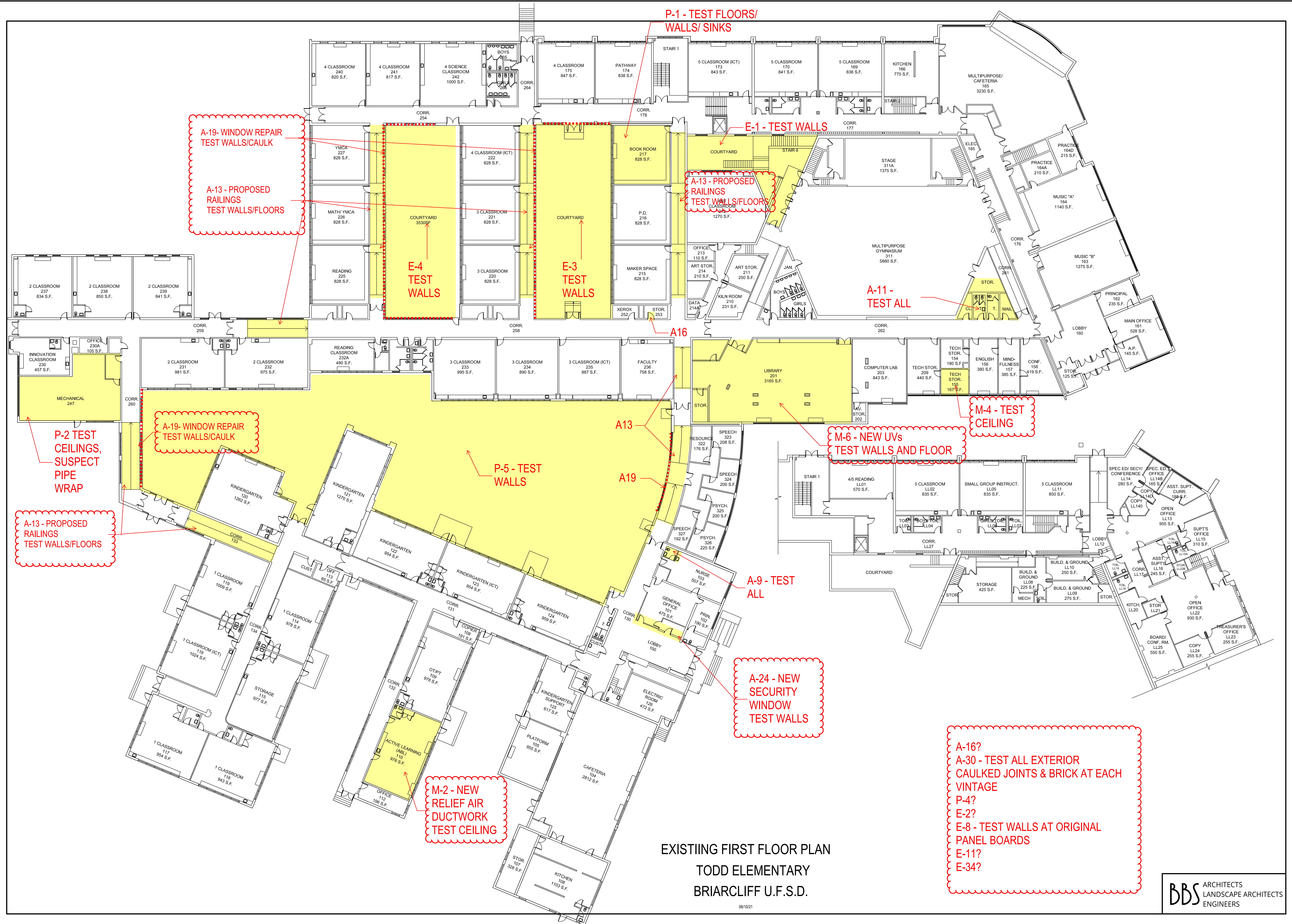
Cheryl O Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision 19.1: 07/28/2021

Date Issued: 07/28/2021



**APPENDIX H:
SCOPE OF WORK DRAWINGS**



Braircliff MANOR Todd Elementary PHASE 1	
Item #	Todd Elementary Phase 1 (BBS File No.21-274B)
A2	Add fall protection to existing dome skylights (21 locations).
A20	Replace EPDM roof areas (1995).
A22	Install missing gutters and downspouts at pitched roof. Reconnect existing loose or missing downspouts.
M1	Replace six older type rooftop exhaust fans to restore to proper operation, and provide adequate ventilation in the bathroom areas.
M2	Provide a relief air path from classroom 111, which was subdivided from classroom 110.
M3	Ensure that all rooftop exhaust fans are turned on during occupied times. It was observed during our walkthrough that several of the bathroom fans did not appear to be on. Upgrade controls as required.
M4	Cap all unused ducts in room 155 storage room as required by code.
M6	Provide humidity controls on the two unit ventilators in the library to alleviate the musty odor as discussed.
E1	Provide exit lighting, fire alarm pull stations, and raise the light fixture in the small courtyard.
E2	Retrofit the original Metropolitan circuit breaker panel in the slop sink and fill all missing spaces as required by code.
E3	Replace the non-functional exit signs in the larger courtyard, as well as adding pull stations and one horn/strobe unit.
E4	In the other larger courtyard, replace the non-functional exit signs, and add two fire alarm pull stations as required.
E5	In the front courtyard provide pull stations and replace the non-functional exit signs as required.
Total	

Braircliff MANOR Todd Elementary PHASE 2		
Item #	Todd Elementary Phase 2 (BBS File No.21-274D)	Loaded Project Cost
A13	Add missing handrails at interior ramps (wall or post mounted).	\$ 168,000
A16	(at Storage/Custodial Rms) with rated CMU construction and doors. Extend demising walls to underside of roof deck. (3 locations).	\$ 97,450
A19	Repair leaks at Corridor windows (near interior courtyards).	\$ 17,500
A24	Security vestibule upgrades (transaction window and security film over existing glazing).	\$ 32,900
A29	Replace caulking at masonry control joints and expansion joints.	\$ 30,800
A30	Tuckpoint mortar joints and replace damaged brick.	\$ 112,000
P1	Provide a separate drinking fountain basin in room 217, and remove the bubbler from the classroom sink as required by code.	\$ 5,000
P2	Provide a natural gas leak detection system in the boiler room area.	\$ 50,000
E8	Retrofit the original Frank Adams circuit breaker panels, for which replacement parts are no longer available. Assume six panels total.	\$ 120,000
E11	Provide hardwired carbon monoxide detectors tied into the building's fire alarm system to replace the current battery and line voltage detectors.	\$ 17,500
A9	Renovate and enlarge Nurse's Office toilet for ADA accessibility.	\$ 77,000
A11	Renovate and enlarge Toilet Rms (near Rm. 156 and 125) for ADA .	\$ 208,325
A12	Provide District-Wide portable lift for ADA accessibility.	\$ 77,000
		1,013,475

Braircliff MANOR Todd Elementary PHASE 3	
	Todd Elementary Phase 3 (BBS File No.21-274F)
A17	Additional storm drainage and piping near Library.
A21	Replace TPO roof areas (2002).
P4	Replace seven waterless urinals with new low flow urinals as discussed.
E27	Replace the screw in fuse type panel in the repair garage with a new 100 amp circuit breaker panel.
E34	Provide surge suppression at the main switchgear location to eliminate power surges.
Total	



Todd Elementary

Roof Core Cuts and testing.

Legend

- | | |
|--------|---------|
| 1. B-1 | 9. N-1 |
| 2. B-2 | 10. N-2 |
| 3. E-1 | 11. M-1 |
| 4. E-2 | 12. M-2 |
| 5. K-1 | 13. O-1 |
| 6. K-2 | 14. O-2 |
| 7. K-3 | |
| 8. N-1 | |

Roof Area B
1990's?
Replaced 2002
Scheduled for future
Replacement in Phase 3

Roof Area A
1963
Replaced 2002
Scheduled for future
Replacement in Phase 3

Roof Area C
1955
Replaced 2002

Roof Area E
1995

Roof Area F
2001
Scheduled for future
Replacement in Phase 3

Roof Area G
2001
Scheduled for future
Replacement in Phase 3

Roof Area D
1963
Replaced 2002
Scheduled for future
Replacement in Phase 3

Roof Area H
1963
Replaced 2002
Scheduled for future
Replacement in Phase 3

Roof Area J
2001

Roof Area K
1955

Roof Area L
1955
Replaced 2002
Scheduled for future
Replacement in Phase 3

Roof Area O
Date unknown

Roof Area M
1990's?


Roof Area N
1952


Test Flashings at
existing exhaust
fans locations for
replacement.
Various locations.

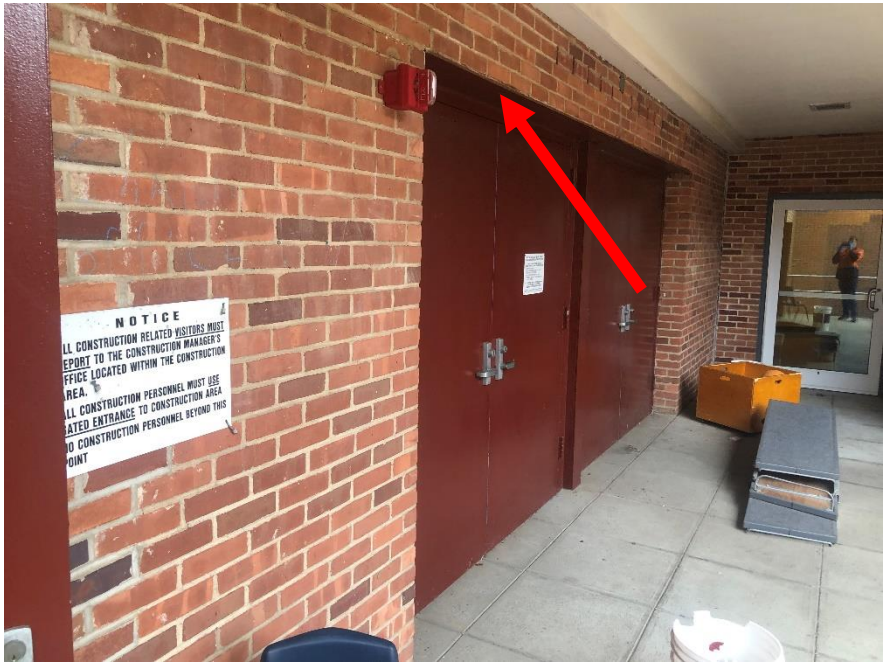
Test Flashings
at existing
skylights 21
locations



**APPENDIX I:
PHOTOGRAPHIC DOCUMENTATION**

 <div> 500 Summit Lake Drive, Suite 450 Valhalla, NY 10595 </div>		<h1>PHOTOGRAPHIC DOCUMENTATION</h1>	
Client: Briarcliff Manor Union Free School District	Project Name: Final Report of Environmental Services for Phase 1, 2 & 3 Project at Todd Elementary School	WSP Project No.: 31403475.005	

<div> PHOTO No.: 1 </div>	
<div> DESCRIPTION: Exterior, Stair 6 Courtyard Tar at foundation wall confirmed to be ACM </div>	

<div> PHOTO No.: 2 </div>	
<div> DESCRIPTION: Exterior (1955 & 1963 Bldg.), Stair 6 Courtyard Beige Door Frame Caulking Confirmed to be ACM </div>	


 500 Summit Lake Drive, Suite 450 Valhalla, NY 10595		<h1>PHOTOGRAPHIC DOCUMENTATION</h1>	
Client: Briarcliff Manor Union Free School District		Project Name: Final Report of Environmental Services for Phase 1, 2 & 3 Project at Todd Elementary School	
		WSP Project No.: 31403475.005	


PHOTO No.: <div>3</div>	
DESCRIPTION: Exterior (1955 & 1963 Bldg.), Stair 6 Courtyard Expansion Joint Caulking (Gray) at wall confirmed to be ACM	

PHOTO No.: <div>4</div>	
DESCRIPTION: Exterior (1952 & 1963 Bldg.) (Typical) Gray Door Frame Caulking confirmed to be ACM (Wooden Trim Doors)	


 500 Summit Lake Drive, Suite 450 Valhalla, NY 10595	<h1>PHOTOGRAPHIC DOCUMENTATION</h1>	
Client: Briarcliff Manor Union Free School District	Project Name: Final Report of Environmental Services for Phase 1, 2 & 3 Project at Todd Elementary School	WSP Project No.: 31403475.005


PHOTO No.: 5		
DESCRIPTION: Interior – Corridor 260 Cementitious Windowsill (White) Confirmed to be ACM		

PHOTO No.: 6		
DESCRIPTION: Interior – Library 201 Sealant (beige) at brick expansion joint confirmed to be ACM		



**APPENDIX J:
FILE SEARCH**



EMSL Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514
 Tel/Fax: (516) 997-7251 / (516) 997-7528
<http://www.EMSL.com / carleplacelab@emsl.com>

EMSL Order: 061927132
Customer ID: LBAP78
Customer PO: 2043465.38
Project ID:

Attention: Marvin Luccioni
 Louis Berger U.S., Inc
 96 Morton Street
 8th floor
 New York, NY 10014

Phone: (718) 730-2741

Fax:

Received Date: 12/10/2019 7:04 PM

Analysis Date: 12/11/2019

Collected Date: 12/05/2019

Project: Todd E.S, 45 Ingham Rd, Briarcliff Manor, Project # 2043465.38, Briarcliff S.D.

Test Report:Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID 01-01 061927132-0001		Description Homogeneity	Room 110 - Glue Dots, Brown Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	12/11/2019	Brown		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	12/11/2019	Brown		100.00% Other	None Detected
Sample ID 01-02 061927132-0002		Description Homogeneity	Room 110 - Glue Dots, Brown Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	12/11/2019	Brown		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	12/11/2019	Brown		100.00% Other	None Detected
Sample ID 02-03 061927132-0003		Description Homogeneity	Room 110 - Gypsum Board, Gray Heterogeneous		
PLM NYS 198.1 Friable	12/11/2019	Brown/ White	18.00% Cellulose	8.00% Ca Carbonate 70.00% Gypsum 4.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID 02-04 061927132-0004		Description Homogeneity	Room 110 - Gypsum Board, Gray Heterogeneous		
PLM NYS 198.1 Friable	12/11/2019	Brown/ White	15.00% Cellulose	8.00% Ca Carbonate 75.00% Gypsum 2.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID 03-05 061927132-0005		Description Homogeneity	Room 110 - Wall Plaster, Brown Coat Homogeneous		
PLM NYS 198.1 Friable	12/11/2019	Brown/ Gray/ Tan		13.00% Ca Carbonate 35.00% Gypsum 2.00% Mica 50.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed

Initial report from: 12/11/2019 17:38:38



EMSL Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514

Tel/Fax: (516) 997-7251 / (516) 997-7528

<http://www.EMSL.com> / carleplacelab@emsl.com

EMSL Order: 061927132

Customer ID: LBAP78

Customer PO: 2043465.38

Project ID:

Test Report:Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID 03-06 061927132-0006		Description Homogeneity	Room 110 - Wall Plaster, Brown Coat Homogeneous		
PLM NYS 198.1 Friable	12/11/2019	Brown/ Gray/ Tan	<1.00% Cellulose	12.00% Ca Carbonate 35.00% Gypsum 53.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID 03-07 061927132-0007		Description Homogeneity	Room 110 - Wall Plaster, Brown Coat Homogeneous		
PLM NYS 198.1 Friable	12/11/2019	Brown/ Gray/ Tan		12.00% Ca Carbonate 38.00% Gypsum 50.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID 04-08 061927132-0008		Description Homogeneity	Room 110 - Wall Plaster, White Coat Heterogeneous		
PLM NYS 198.1 Friable	12/11/2019	Tan/ White		30.00% Ca Carbonate 60.00% Gypsum 10.00% Non-fibrous (other)	None Detected
Paint layer present in sample, not included in analysis.					
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID 04-09 061927132-0009		Description Homogeneity	Room 110 - Wall Plaster, White Coat Heterogeneous		
PLM NYS 198.1 Friable	12/11/2019	Tan/ White		25.00% Ca Carbonate 65.00% Gypsum 10.00% Non-fibrous (other)	None Detected
Paint layer present in sample, not included in analysis.					
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID 04-10 061927132-0010		Description Homogeneity	Room 110 - Wall Plaster, White Coat Heterogeneous		
PLM NYS 198.1 Friable	12/11/2019	Tan/ White		25.00% Ca Carbonate 60.00% Gypsum 15.00% Non-fibrous (other)	None Detected
Paint layer present in sample, not included in analysis.					
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed

Initial report from: 12/11/2019 17:38:38



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EMSL Order: 061927132

Customer ID: LBAP78

Customer PO: 2043465.38

Project ID:

Test Report: Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID 05-11 061927132-0011		Description Homogeneity	Elec Room - Ceiling Insulation, White Heterogeneous		
PLM NYS 198.1 Friable	12/11/2019	Brown/ Gray/ White	12.00% Cellulose 85.00% Min. Wool	3.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID 05-12 061927132-0012		Description Homogeneity	Elec Room - Ceiling Insulation, White Homogeneous		
PLM NYS 198.1 Friable	12/11/2019	Brown/ Gray/ White	10.00% Cellulose 80.00% Min. Wool	10.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID 05-13 061927132-0013		Description Homogeneity	Elec Room - Ceiling Insulation, White (Type 1) Homogeneous		
PLM NYS 198.1 Friable	12/11/2019	Brown/ Gray/ White	8.00% Cellulose 85.00% Min. Wool	7.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID 06-14 061927132-0014		Description Homogeneity	Elec Room - Ceiling Insulation, Brown (Type 2) Homogeneous		
PLM NYS 198.1 Friable	12/11/2019	Brown/ Tan/ Various	98.00% Cellulose	2.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID 06-15 061927132-0015		Description Homogeneity	Elec Room - Ceiling Insulation, Brown (Type 2) Homogeneous		
PLM NYS 198.1 Friable	12/11/2019	Brown/ Tan/ Various	99.00% Cellulose	1.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID 06-16 061927132-0016		Description Homogeneity	Elec Room - Ceiling Insulation, Brown (Type 2) Homogeneous		
PLM NYS 198.1 Friable	12/11/2019	Brown/ Tan/ Various	98.00% Cellulose	2.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed

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EMSL Order: 061927132

Customer ID: LBAP78

Customer PO: 2043465.38

Project ID:

Test Report: Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID 07-17 061927132-0017		Description	Elec Room - Ceiling Plaster, Brown Coat		
		Homogeneity	Heterogeneous		
PLM NYS 198.1 Friable	12/11/2019	Brown/ Gray/ Rust		12.00% Ca Carbonate 18.00% Non-fibrous (other) 70.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID 07-18 061927132-0018		Description	Elec Room - Ceiling Plaster, Brown Coat		
		Homogeneity	Heterogeneous		
PLM NYS 198.1 Friable	12/11/2019	Brown/ Gray/ Rust	3.00% Min. Wool	15.00% Ca Carbonate 17.00% Non-fibrous (other) 65.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID 07-19 061927132-0019		Description	Elec Room - Ceiling Plaster, Brown Coat		
		Homogeneity	Heterogeneous		
PLM NYS 198.1 Friable	12/11/2019	Brown/ Gray/ Rust		12.00% Ca Carbonate 13.00% Non-fibrous (other) 75.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID 08-20 061927132-0020		Description	Elec Room - Ceiling Plaster, White Coat		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable	12/11/2019	Gray		15.00% Ca Carbonate 14.00% Non-fibrous (other) 6.00% Perlite 65.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID 08-21 061927132-0021		Description	Elec Room - Ceiling Plaster, White Coat		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable	12/11/2019	Gray		10.00% Ca Carbonate 13.00% Non-fibrous (other) 7.00% Perlite 70.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed

Initial report from: 12/11/2019 17:38:38



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EMSL Order: 061927132

Customer ID: LBAP78

Customer PO: 2043465.38

Project ID:

Test Report: Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID 08-22 061927132-0022		Description Homogeneity	Elec Room - Ceiling Plaster, White Coat Homogeneous		
PLM NYS 198.1 Friable	12/11/2019	Gray		15.00% Ca Carbonate 14.00% Non-fibrous (other) 6.00% Perlite 65.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed

Initial report from: 12/11/2019 17:38:38



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EMSL Order: 061927132

Customer ID: LBAP78

Customer PO: 2043465.38

Project ID:

Test Report: Asbestos Analysis of Bulk Material

The samples in this report were submitted to EMSL for analysis by Asbestos Analysis of Bulk Materials via NYS ELAP Approved Methods. The reference number for these samples is the EMSL Order ID above. Please use this reference number when calling about these samples.

Report Comments:

Sample Receipt Date: 12/10/2019

Sample Receipt Time: 7:04 PM

Analysis Completed Date: 12/11/2019

Analysis Completed Time: 11:04 AM

Analyst(s):

Tomas Montes De Oca PLM NYS 198.1 Friable (20)

Tomas Montes De Oca PLM NYS 198.6 NOB (2)

Rosemary Ortega TEM NYS 198.4 NOB (2)

Samples reviewed and approved by:

Daniel Clarke, Asbestos Laboratory Manager
or Other Approved Signatory

NOB = Non Friable Organically Bound N/A = Not Applicable VCM = Vermiculite Containing Material

-In New York State, TEM is currently the only method that can be used to determine if NOB materials can be considered or treated as non-asbestos containing.


All samples examined for the presence of vermiculite when analyzed via NYS 198.1.

-NYS Guidelines for Vermiculite containing samples are available at http://www.wadsworth.org/labcert/elapcert/forms/VermiculiteInterimGuidance_Rev070913.pdf EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples were received in good condition unless otherwise noted.

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Samples analyzed by EMSL Analytical, Inc. Carle Place, NY NYS ELAP 11469

Initial report from: 12/11/2019 17:38:38


	LOUIS BERGER	ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY				PAGE <u>1</u> OF <u>2</u>
LB PROJ <u>2043465.38</u>		LOCATION(S) SURVEYED: <u>Room 110</u>				
CLIENT: <u>BRIARCLIFF S.D.</u>		PROPOSED PROJECT: <u>RENOVATION</u>				
PROJECT SITE: <u>TODD E.S. @ 45 INGHAM RD., BRIARCLIFF MANOR</u>		DATE(S) OF INSPECTION: <u>12/05/19</u>				
Project Manager: _____		Inspector(s) <u>M. Muccioni</u>				
LOUIS BERGER TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341 ADDRESS: 98 Morton Street, 8 Floor, New York, NY 10014		RESULTS TO: _____ <u>M. Muccioni@louisberger.com</u>		TURNAROUND TIME: <input checked="" type="checkbox"/> 4 HRS. <input type="checkbox"/> 24 HRS. <input type="checkbox"/> 48 HRS. <input type="checkbox"/> 72 HRS.		
HA	SAMPLE NO.	MATERIAL DESCRIPTION	SAMPLE LOCATION	APPROX. QUANTITY (LF/SF)	FIELD NOTES	
01	01	GLUE DOTS, BROWN	Room 110			
↓	02	↓				
02	03	GYPSUM BOARD, GRAY			CEILING	
↓	04	↓			↓	
03	05	WALL PLASTER, BROWN COAT				
↓	06	↓				
↓	07	↓				
04	08	WALL PLASTER, WHITE COAT				
↓	09	↓				
↓	10	↓				
05	11	CEILING INSULATION, WHITE	Elec Room			
↓	12	↓				

19 DEC 10 PM 7:04
 CARROLL PLACE, NY
 MARY TOLSON

CHAIN OF CUSTODY											
Relinquished by: (print) <u>M. Muccioni</u>	(Sign) <u>[Signature]</u>	<u>12/10/19</u>	AM/PM	Relinquished by: (print) _____	(Sign) _____	____/____/____	AM/PM	Relinquished by: (print) _____	(Sign) _____	____/____/____	AM/PM
Received by: (print) <u>U. McKay</u>	(Sign) <u>[Signature]</u>	<u>12/10/19</u>	AM/PM	Received by: (print) _____	(Sign) _____	____/____/____	AM/PM	Received by: (print) _____	(Sign) _____	____/____/____	AM/PM

GENERAL NOTES: All inconclusive NOBs to be analyzed by TEM. Please stop at 1st positive in any homogeneous group.

061927132

 LOUIS BERGER		ASBESTOS SURVEY DATA SHEET/ CHAIN OF CUSTODY				PAGE <u>2</u> OF <u>2</u>	
LB PROJ <u>2043465.38</u> CLIENT: <u>BRIARCLIFF S.D.</u>				LOCATION(S) SURVEYED: <u>Room 110</u> PROPOSED PROJECT: <u>RENOVATION</u> DATE(S) OF INSPECTION: <u>12/05/19</u> Inspector(s) <u>M. Muccioni</u>			
PROJECT SITE: <u>TOODES @ 45 INGHAM RD., BRIARCLIFF MANOR</u> Project Manager: _____							
LOUIS BERGER TELEPHONE NO.: (212) 612-7900 FAX NO.: (212) 363-4341 ADDRESS: 98 Morton Street, 8 Floor, New York, NY 10014		RESULTS TO: _____ <u>Muccioni@LouisBerger.com</u>		TURNAROUND TIME: <input type="checkbox"/> 4 HRS. <input checked="" type="checkbox"/> 24 HRS. <input type="checkbox"/> 48 HRS. <input type="checkbox"/> 72 HRS.			
HA	SAMPLE NO.	MATERIAL DESCRIPTION	SAMPLE LOCATION		APPROX. QUANTITY (LF/SF)	FIELD NOTES	
05	13	CEILING INSULATION, WHITE (TYPE 1)	ELEC Room				
06	14	CEILING INSULATION, BROWN (TYPE 2)					
↓	15						
↓	16						
07	17	CEILING PLASTER, BROWN COAT					
↓	18						
↓	19						
08	20	CEILING PLASTER, WHITE COAT					
↓	21						
↓	22						

19 DEC 10 PM 7:04
 CARLE PLACE, NY

CHAIN OF CUSTODY											
Relinquished by: (print) <u>M. Muccioni</u>	(Sign) <u>[Signature]</u>	<u>12/10/19</u>	AM/PM	Relinquished by: (print) _____	(Sign) _____	____/____/____	AM/PM	Relinquished by: (print) _____	(Sign) _____	____/____/____	AM/PM
Received by: (print) <u>J. McCoy</u>	(Sign) <u>[Signature]</u>	<u>12/10/19</u>	AM/PM	Received by: (print) _____	(Sign) _____	____/____/____	AM/PM	Received by: (print) _____	(Sign) _____	____/____/____	AM/PM

GENERAL NOTES: All inconclusive NOBs to be analyzed by TEM. Please stop at 1st positive in any homogeneous group.

061927132



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<http://www.EMSL.com / carleplacelab@emsl.com>

EMSL Order: 062000260
Customer ID: LBAP78
Customer PO: 2043465.38
Project ID:

Attention: Marvin Luccioni
 Louis Berger U.S., Inc
 96 Morton Street
 8th floor
 New York, NY 10014

Phone: (718) 730-2741

Fax:

Received Date: 01/06/2020 4:10 PM

Analysis Date: 01/07/2020

Collected Date: 01/03/2020

Project: 2043465.38, Briarcliff S.D., Todd E.S., Room 110

Test Report:Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID 01-01 062000260-0001		Description Homogeneity	Room 110 - Glue Dots assoc. w./ Pegboard, Brown Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	01/07/2020	Brown		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	01/07/2020	Brown		100.00% Other	None Detected
Sample ID 01-02 062000260-0002		Description Homogeneity	Room 110 - Glue Dots assoc. w./ Pegboard, Brown Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	01/07/2020	Brown		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	01/07/2020	Brown		100.00% Other	None Detected
Sample ID 02-03 062000260-0003		Description Homogeneity	Room 110 - Pegboard Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	01/07/2020	Green		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	01/07/2020	Green		100.00% Other	None Detected
Sample ID 02-04 062000260-0004		Description Homogeneity	Room 110 - Pegboard Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	01/07/2020	Green		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	01/07/2020	Green		100.00% Other	None Detected

Initial report from: 01/07/2020 21:54:30



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EMSL Order: 062000260

Customer ID: LBAP78

Customer PO: 2043465.38

Project ID:

Test Report: Asbestos Analysis of Bulk Material

The samples in this report were submitted to EMSL for analysis by Asbestos Analysis of Bulk Materials via NYS ELAP Approved Methods. The reference number for these samples is the EMSL Order ID above. Please use this reference number when calling about these samples.

Report Comments:

Sample Receipt Date: 1/6/2020

Sample Receipt Time: 4:10 PM

Analysis Completed Date: 1/7/2020

Analysis Completed Time: 1:06 PM

Analyst(s):

Omatie Ramrattan-Scarallo

Omatie Ramrattan-Scarallo PLM NYS 198.6 NOB (4)

Keith McWilliams

Keith McWilliams TEM NYS 198.4 NOB (4)

Samples reviewed and approved by:

Daniel Clarke

Daniel Clarke, Asbestos Laboratory Manager
or Other Approved Signatory

NOB = Non Friable Organically Bound N/A = Not Applicable VCM = Vermiculite Containing Material

-In New York State, TEM is currently the only method that can be used to determine if NOB materials can be considered or treated as non-asbestos containing.

All samples examined for the presence of vermiculite when analyzed via NYS 198.1.

-NYS Guidelines for Vermiculite containing samples are available at http://www.wadsworth.org/labcert/elapcert/forms/VermiculiteInterimGuidance_Rev070913.pdf EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples were received in good condition unless otherwise noted.

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Samples analyzed by EMSL Analytical, Inc. Carle Place, NY NYS ELAP 11469

Initial report from: 01/07/2020 21:54:30



565 Taxter Road, Suite 510
Elmsford, New York 10523

HOMOGENEOUS AREA SHEET

Client: Briarcliff Manor UFSD

Project Site: Todd Elementary School

Page 1 of 1

Inspector(s): Drew Cheskin

Management Planner(s): Drew Cheskin

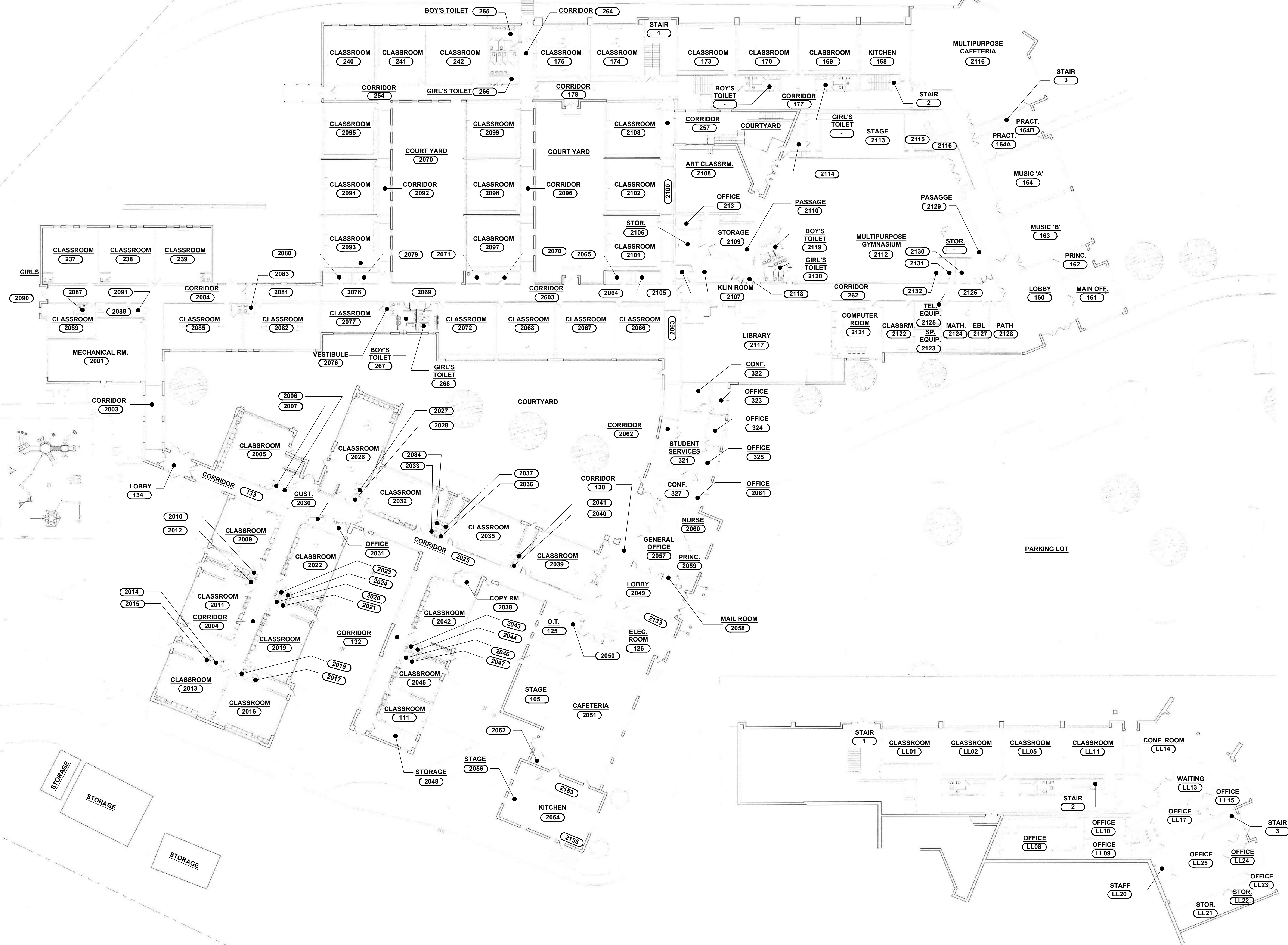
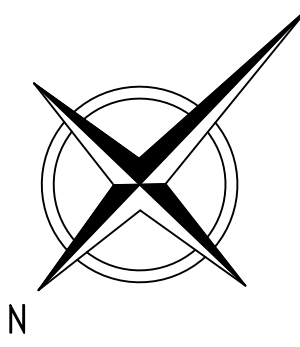
Project #: 2042839.044

HA #	Homogenous Area Description	Material Type	ACM	Friable
01	9"x9" White VAT w/Black Specks and Mastic	M	YES	NO
02	9"x9" Blue VAT w/White Specks and Mastic	M	YES	NO
03	9"x9" Tan VAT w/Black Marbled and Mastic	M	YES	NO
04	9"x9" Orange-Born VAT and Mastic	M	YES	NO
05	9"x9" Gray VAT w/Beige Specks and Mastic	M	YES	NO
06	9"x9" White VAT w/Brown Specks and Mastic	M	YES	NO
07	9"x9" Black VAT w/White Spots and Mastic	M	YES	NO
08	9"x9" Black VAT w/White Marbled and Mastic	M	YES	NO
09	Pipe Elbows	TSI	YES	YES
10	Pipe Insulation	TSI	YES	YES

TSI = Thermal System Insulation

S = Surfacing

M = Miscellaneous



FIRST FLOOR PLAN

BASEMENT FLOOR PLAN

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HERA SITE PLAN
MIDDLE SCHOOL
HIGH SCHOOL
BRIARCLIFF MANOR, USFSD
444 PLEASANTVILLE ROAD
BRIARCLIFF MANOR, NY 10510

PROJECT TITLE
BRIARCLIFF MANOR U.S.F.S.D.
CAPITAL IMPROVEMENT PROJECT
TODD ELEMENTARY SCHOOL - BID NO
BRIARCLIFF MANOR, NY 10510

DRAWING TITLE
SPACE IDENTIFICATION
BASEMENT AND FIRST FLOOR PLAN

DATE: JULY 2019

SCALE
AS NOTED

DRAWN BY
J.P.

CHECKED BY
D.C.

DRAWING NO.
SP-001

FILE NO.
2042839.052

FIRST FLOOR TOTAL 107,346 S.F.



SUMMARY OF SPACE



2019 AHERA 3 YEAR RE-INSPECTION REPORT MANAGEMENT PLAN UPDATE

**BRIARCLIFF MANOR UNION FREE SCHOOL DISTRICT
TODD ELEMENTARY SCHOOL
45 Ingham Road, Briarcliff Manor, NY 10510**

Space ID	Description / Common Name	HA	HA Description	Quantity	Assesment	Response Action			Comment
						Remove	Repair	O&M	
1013	Crawlspace under Storage	1	Pipe Insulation	100 LF	7	-	-	100 LF	Unable to locate, May have been Abated
1013	Crawlspace under Storage	2	Pipe Elbow	100 LF	7	-	-	100 LF	Unable to locate, May have been Abated
2057	Safe in Office	3	9"x9" Floor Tile and Associated Mastic	64 SF	X	-	-	64 SF	Green w/ White Stripes
2067	Room 235	3	9"x9" Floor Tile and Associated Mastic	700 SF	X	-	1 SF	700 SF	White w/ Brown Specks, Chipped @ Door
2076	Vestible to Room 232A	3	9"x9" Floor Tile and Associated Mastic	60 SF	X	-	-	60 SF	Unable to locate Funtional Space
2082	Room 232	3	9"x9" Floor Tile and Associated Mastic	900 SF	X	-	-	900 SF	Orange-Brown
2085	Room 231	3	9"x9" Floor Tile and Associated Mastic	900 SF	X	-	-	900 SF	White w/ Brown Specks
2091	JSC by Boiler Room	3	9"x9" Floor Tile and Associated Mastic	15 SF	X	-	5 SF	10 SF	Gray w/ Beige Specks
2110	Art Room Stairs	3	9"x9" Floor Tile and Associated Mastic	60 SF	X	-	-	60 SF	Gray w/ Beige Specks
2116	District Office Stairs	3	9"x9" Floor Tile and Associated Mastic	75 SF	X	-	-	75 SF	Black w/ White Specks
2125	Room 155 - Closet A	3	9"x9" Floor Tile and Associated Mastic	300 SF	X	-	-	300 SF	Gray w/ Beige Specks
2126	Room 155 - Closet B	3	9"x9" Floor Tile and Associated Mastic	10 SF	X	-	-	10 SF	Tan w/ Black Marbled

ASSESSMENT CATEGORIES

- 1. = Damaged or Significantly Damaged TSI ACBM
- 2. = Damaged Friable Surfacing ACBM
- 3. = Significantly Damaged Friable Surfacing ACBM
- 4. = Damaged or Significantly Damaged Friable Miscellaneous ACBM

- 5. = ACBM with Potential for Damage
- 6. = ACBM with Potential for Significant Damage
- 7. = Any Remaining Friable ACBM or Friable Suspect ACBM
- X. = Not Applicable (Material is Nonfriable Surfacing or Miscellaneous Material)

Briarcliff Manor UFSD
Middle School & High School
444 Pleasantville Rd
Briar Cliff Manor, N.Y.

Roof Assessment Report



Prepared For
Mr. Gregory O'Conner
Director Of Architecture CSI CDT
BBS Architects
August 11, 2021



On Tuesday 8/10/21 an assessment inspection was performed on the above roof areas excluding both the MS & HS Gym roof areas that were previously replaced. The inspection was initiated to determine the existing system and to provide long term solutions.

Perimeter Detail of Roof is terminated by way of a metal edge fascia and masonry bulkhead walls.

Drainage is accomplished by way of internal drains.

Flashing material is EPDM material.

INSPECTION REPORT

Perimeter Edge: Fair: Perimeter of roof is terminated with a metal edge fascia which other than in a couple of locations appears to be intact. According to Factory Mutual data, almost 60 percent of roof failures begin at the edge. This statistic emphasizes the critical nature of secure, safe roof edges in protecting the building envelope—and the potential pitfalls of edging that fail.

The Single Ply Roofing Institute (SPRI), a roofing industry trade association, created an edge standard for low-slope roofs called “ES-1.” ES-1 was accepted by the American National Standard Institute (ANSI) as a standard and has been adopted by the International Code Council and included in the 2015 International Building Code (IBC) as paragraph 1405 – “Edge Securement for Low-Slope Roofs.” Numerous states and U.S. government departments have adopted the 2015 IBC; more details can be found at www.iccsafe.org/government/adoption. Formally called “ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems,” the ES-1 standard has existed for a number of years. With its inclusion in the 2015 IBC, ES-1 has now asked for calculating the wind load on edges for low-slope roofs and prescribes methodology for testing and evaluating the ability of edge systems to withstand those loads, thus ensuring wind resistance and long-term performance. ES-1 takes into account all the important factors that go into a properly designed roof edge. These include wind speed, building height, roof edge regions, building exposure, importance factors, metal thickness, galvanic compatibility and resistance, rooftop appliances, nailer securement, membrane attachment, and fastener spacing. There are three tests prescribed in ES-1, and these are based on the American Society of Civil Engineers’ document ASCE7/02, *Minimum Design Loads for Buildings and Other Structures*. Test method RE-1 measures how well the edge secures the perimeter on ballasted or mechanically-attached membranes. Method RE-2 is a pull-off test for metal edge flashing. It tests for wind load on the face dimension of the flashing system. RE-3 tests the strength of the metal coping cap to assure it meets or exceeds calculated design wind pressure. RE-3 tests wind load on both the face and top dimension and the top and back leg dimension. Many pre-manufactured roof edge systems have been tested according to ANSI/SPRI ES-1 requirements. The National Roofing Contractors Association (NRCA) also has an approval listing based on these requirements. To ensure that you’re up to code, be sure to write specifications requiring roof edge systems to meet ANSI/SPRI ES-1 standards for all low-slope construction and monitor the process to ensure that the specifications are followed. To review the ANSI/SPRI ES-1 standard, now required as part of the 2015 International Building Code. **Johns Manville Presto-Tite metal edge systems are tested and approved according to ANSI/SPRI ES-1 requirements.**

The remaining perimeter consists of bulkhead brick masonry walls that contain an EJ style expansion joint detail at the base.

Deck Substrate: The foundation or base which the roofing system is dependant is the structural deck. The architectural requirements are that the deck be designed to support the weight of the loads such as wind, snow, rain, equipment and the dead loads of the deck itself and the roof system are not enough to produce a base adequate for the application of a roof system. To provide an adequate foundation for the construction of a roof system, the structural deck must be smooth, free of humps, depressions offsets at joints and be stiff enough to support the equipment and materials needed to apply the roof system. Unless provision is made by use of non-structural fills, the structural deck must provide for the drainage of water from the roof. Enough slope should be built in so that water does not collect in the low areas between the roof framing members and so that the roof is completely dry 48 hours after it stops raining. The deck is constructed of both concrete and corrugated steel and appears not to be providing consistent proper slope for positive drainage. There was evidence of ponding water throughout majority roof surface areas.

Insulation: The primary function of roof insulation is to retard heat flow by acting as a barrier or retarder between the inside and outside temperature conditions. The insulation either reduces heat flow from the hot or warm side, or reduces heat entering the cold side. There is 3 1/2" of polyisocyanurate and 1/2" coverboard throughout the roof areas.



Photo exhibits Reinforced EPDM, 3 1/2" of polyisocyanurate & 1/2" fiberboard over metal deck of all roof areas other than areas K & H that consist of concrete substrate.



Area K consisted of 6" of tapered insulation at the high point and 3 1/2" at the Low point on a concrete deck

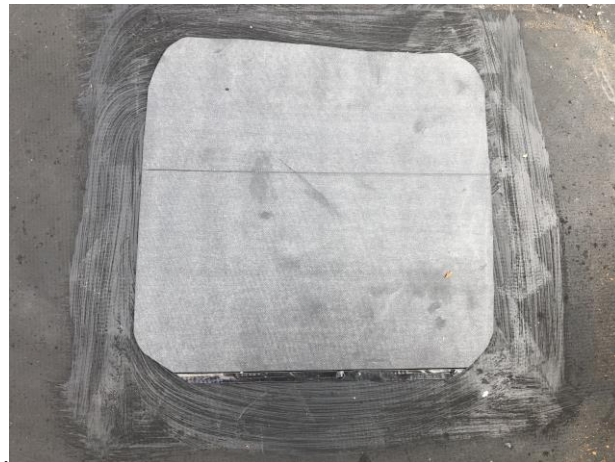


Photo exhibits repairs to probes made according to NRCA recommendations with compatible EPDM material.

Field: The roof consists of both a non-reinforced and a reinforced a fully adhered 60 Mil EPDM (Ethylene Propylene Diene Monomer) single ply system installed over 3 ½" inches of polyisocyanurate insulation, ½" fiberboard. The surface membrane is exhibiting fatigue by visible evidence of the underlying reinforcement scrim of the membrane. This is the result of the suns UV Light, heat, oxidation and the natural effects of aging. The membrane basically has dried out and lost its elasticity and is no longer able to withstand the expansion, contraction and thermal shock that the system and roof surface experience.

The main enemies of the roofs in the northeast are also freeze to thaw cycles and thermal shock. Thermal shock is a stress producing phenomenon resulting from sudden and usually extreme temperature changes that adversely affect the roof membrane, such as the temperature transition from a sunny 90-degree day (Roof Surface Temp 150) that experiences an afternoon thunder shower. The existing roof surface temperature will drop from 150 degrees to 80 degrees in a couple of hours' time. This condition has a tremendous effect on the roof system which results in surface splits to the membrane. See photos of high volume of surface repairs.

In the future which has already taken place with the Gym roof's replacements, a white surface will help reflect and prevent that condition. Some existing plumbing and curbs will more than likely need to be raised when reroofing takes place due to the increased required R Value and insulation thickness.

Insulation: Condition Failed: The primary function of roof insulation is to retard heat flow by acting as a barrier or retarder between the inside and outside temperature conditions. The insulation either reduces heat flow from the hot or warm side, or reduces heat entering the cooler side. There is approximately 3" of polyisocyanurate providing an R Value of 15, and a ½" Fiberboard (R Value 1.4) for a total of 16.4 current building code requires R Value of 30.

Drainage: Drainage is accomplished by way of internal drains throughout the field of the roof. At the time of the survey the majority were clear of debris and appeared to be functioning properly. There is evidence of ponding water throughout all fields due to a lack of proper positive slope. See Photos. This condition not only contributes to membrane failure by the moss and algae that develop on the roof surface but becomes a breeding ground for mosquitos and viruses.

Penetrations: Failed: The curb flashings of the vent units are open and exposed allowing for water entry. See photos.

Overall Rating: Condition Failed: The present condition of the existing roof system states that is in need of replacement. This roof system has reached the end of its useful life, and is it running on borrowed time, not taking a proactive approach with this system will continue to result in on going leaks and inconveniences, interior damage along with the concern of the toxic mold possibly developing below which is a concern for individuals with allergies and respiratory ailments.



Photo exhibits unattached metal edge fascia.



Photo exhibits shingle roof transition on roof area K.



Above existing fascia should be able to be retained, existing roof metal edge to be replaced with new TPO roof system.

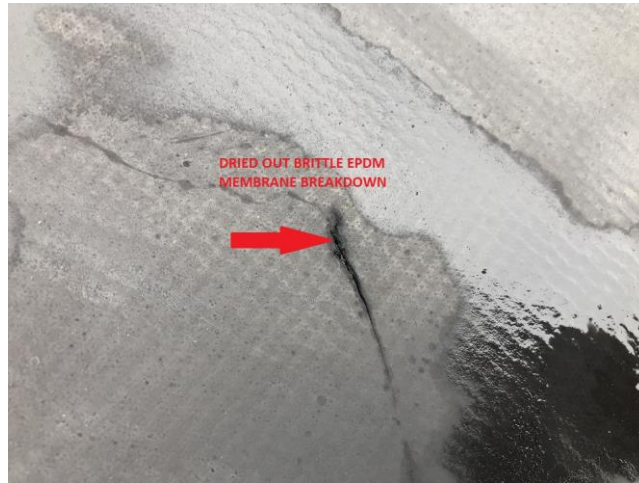


Above and below photos exhibit perimeter bulkhead wall conditions.



Above and below photos exhibit a high volume of perimeter bulkhead consists of an expansion joint detail.

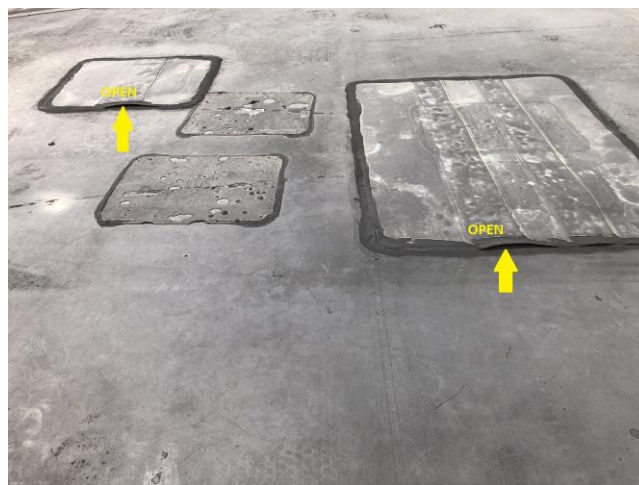




Above photo exhibits failing, dried out, brittle membrane, that has lost its elasticity and can no longer withstand the constant expansion, contraction and thermal shock that the roof system and surface experience.



Above and below photos exhibit the ongoing temporary repairs to failing membrane.



Repairs beginning to become unadhered



Above photo exhibits previous temporary repairs and no longer watertite.



Above and below photos exhibit open seams and side laps that are allowing for water entry.





Above and below photos exhibit the standing ponding water condition throughout fields.



Above photo also exhibits standing water conditions.

Recommended Solution: Replacement

Priority: 2022

Scope of Work: TPO System

Remove and legally dispose of the existing roof system down to the deck structure according to state and county requirements. Mechanically fasten and or adhere according to code new **Johns Manville tapered 1/8":12 polyisocyanurate insulation and 1/4" invinsa Board or JM Dexcell gypsum cover board for positive slope and drainage with a minimum R Value of 30.**

Invinsa cover board optimizes roof system performance in new, re-cover and re-roof applications. The coated fiber glass facers provide strong, smooth surfaces suitable for fully adhered membranes.

Dexcell cover board optimizes roof system performance in new, re-cover and re-roof applications. It provides FM Class 1 for fire barrier requirements and UL Class A unlimited slope with excellent surface burning characteristics.

Install by way of fully adhering with Johns Manville 60 Mil SA TPO Roof system throughout the fields. Johns Manville TPO has long term superior weather ability through a wide range of temperatures and conditions and demonstrates superior ozone resistance. JM TPO is a Energy Star® compliant with an SRI of 95 that exceeds the EPA standard. This system is a no odor Class A Fire Rated FM system. A higher elongation of 27% in the machine direction, versus most competitors ensures a greater accommodation for deck movement. Most importantly, JM TPO membrane has superior cold temperature mechanical properties. Brittleness Point D 2137 -40°C (-40°F) Pass @ -40°C (-40°F) The durability and strength of TPO make JM's roofing membrane an ideal long-term solution for roofs that demand **high performance at a lower life cycle cost.**

Replace existing drains with JM Retrofit drains.

Install according to Johns Manville details new Perimeter EJ Style expansion joints to base perimeter bulkhead walls and CF style for in field of roof.

Install according to building code new Johns Manville Presto-Tite .040 alum perimeter metal edge. **System has FM 1-645 and ANSI-SPRI ES-1 Design Pressure of 290PSF approval Rating.**

This system which includes all components above the roof deck is backed by JM's single source complete system 20 Yr. No Dollar Limit Warranty.

Again, Johns Manville, Moseley Assoc. and I wish to thank you for this opportunity and look forward to working with you in the near future in providing BBS and the Briarcliff UFSD with a long-term successful roofing solution. If you should have any questions, or if I can be of any further assistance please don't hesitate to contact me at 914-356-1233.

Respectfully yours

John Moore

www.jmroofing.news



ASSEMBLY LETTER

Roofing Systems

717 17th St. Denver, CO 80202 (800) 922-5922

September 23, 2021

The following roof system has been reviewed and approved as a warrantable system under the Johns Manville Peak Advantage Guarantee Program. A guarantee will be issued to the contractor in accordance with all procedures and requirements of the Johns Manville Peak Advantage Guarantee Program.

PROJECT INFORMATION

Project Number:	8059577 <i>**Reference number when corresponding with Johns Manville**</i>
Project Name:	Todd Elementary School
Guarantee Term:	20 Year No Dollar Limit
Project Location:	Briarcliff Manor UFSD 444 Pleasantville Rd Briarcliff Manor, NY 10510

RIDERS

Please reference SDR # JFRED09232021T when applying for your Johns Manville Guarantee

Wind (mph)	Hail (inches)	Accidental Puncture (repair hours)	Ponding	Overburden	Lightweight Concrete
<input checked="" type="checkbox"/> 120	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ROOF ASSEMBLY AS PROPOSED TO JOHNS MANVILLE

Roof Area Name: Steel Deck Areas
System & Spec: TPO – ST6RA

Deck Information

Deck Type & Thickness:	Steel Deck; 22 gauge
Deck Slope (inch / foot):	0
Materials Left in Place:	

Insulation Layer 1

Insulation:	ENRGY 3, 3.7 inch (4x8 boards)	
Attachment:	Fastened	UltraFast Fasteners & UltraFast Plates
Attachment Pattern:	Field (Zone 1): 8 Perimeter (Zone 2): 24 Corner (Zone 3): 32	Fasteners & Plates per board

Insulation Layer 2

Insulation:	Tapered ENRGY 3 (4x4 boards) 1/8 in per ft slope	
Attachment:	Ribbon Adhered	JM Two-Part Urethane Insulation Adhesive (UIA)
Attachment Pattern:	Field (Zone 1): 12 in oc Perimeter (Zone 2): 4 in oc Corner (Zone 3): 4 in oc	Bead Spacing using 3/4 inch bead

Cover Board

Cover Board:	ProtectoR HD, 0.5 inch (4x4 boards)	
Attachment:	Ribbon Adhered	JM Two-Part Urethane Insulation Adhesive (UIA)
Attachment Pattern:	Field (Zone 1): 12 in oc Perimeter (Zone 2): 4 in oc Corner (Zone 3): 4 in oc	Bead Spacing using 3/4 inch bead

Membrane

Membrane:	JM TPO 60	
Attachment:	Adhered	JM All Season Sprayable Bonding Adhesive

Flashings

Flashing Materials:	JM TPO 60 adhered using JM All Season Sprayable Bonding Adhesive	
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Accessories

Edge Metal:	Presto-Tite Fascia System (Single Ply Systems) or PrestoLock Gold Coping	Shop drawings must be submitted to JM Technical for review and approval.
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DESIGN CRITERIA & INFORMATION**Perimeter and Corner Dimensions**

Perimeter and corner dimensions for buildings less than 60 ft. in height:

Equal to the smaller of:

- 0.1 times the building lesser plan dimension (overall length or width)
- 0.4 times the eave height

but will never measure less than 0.04 times the building lesser plan dimension and never less than 3 ft.

Perimeter and corner dimensions for buildings greater than 60 ft. in height:

Equal to 0.1 times the building lesser plan dimension (overall length or width), but never less than 3 ft.

Corners are "L" shaped with legs twice the width of the perimeter.

Buildings with continuous parapets 36" or greater may treat corners as perimeters.

Ensure any whole or partial insulation board that falls within the calculated perimeter or corner has the increased securement applied over the entire board. This must also be true for any roof cover/base sheet width when the roll is parallel to the building edge.

Installation Notes

- For additional installation guidelines and considerations, please visit <https://www.jm.com/en/commercial-roofing/specs-and-details/>

Johns Manville is a manufacturer of commercial roofing products and offers this general conceptual information to you as a courtesy. This complimentary assistance is not to be used or relied upon by anyone as a substitute for professional engineering design or documentation required by building code, contract or applicable law. By accepting these comments you agree they do not constitute any representations, endorsements of, or an assumption by Johns Manville of any liability for either the adequacy of the design of this building or of any material not supplied by Johns Manville. These comments are for Johns Manville Guarantee purposes only. Additional requirements may be necessary as determined by contract documents, building code and regulations, or governing entity.

- Listed below are recommendations for installation of products **only if included** in the proposed roof assembly

Attachment Method or Product	Recommendation
Materials Left In Place	<ul style="list-style-type: none"> Moisture scan is required All wet/damaged materials material must be completely removed and replaced. All flashing must be removed, all drains cut out, and new sumps installed.
Asphalt	Installed in full coverage hot asphalt
MBR Cold Application Adhesive	Wait 28 days to allow adhesive to cure
Roofing Systems Urethane Adhesive (RSUA)	Install with ¾ inch bead
JM 2 Part Urethane Insulation Adhesive (UIA)	Install with ¾ inch bead
JM All Season Sprayable Adhesive	Fan Pattern shall use 50% overlap
JM 2 Part Urethane Insulation Adhesive (UIA) Canister	Spatter Pattern shall use 80% coverage
UltraFast Fastener Plates – Square Flat	<ul style="list-style-type: none"> May be used with all Insulation and Cover Boards Recommended installation with high compressive strength boards (>80 PSI) Use with Structural Concrete Deck Fasteners
UltraFast Fastener Plates – Recessed Round	Installation of insulation boards or cover boards with lower compressive strength
Polymer Auger Fastener Plates – Cover Boards	Install with 3-inch plates
Polymer Auger Fastener Plate – Membrane	Install with 2-inch plates
Overburden	Owner responsible for removal and reinstallation of any/all overburn products should a roof leak occur and require repair.

The system(s) shall be eligible for a Johns Manville Peak Advantage Roofing System Guarantee when installed by a certified Johns Manville contractor and inspected and approved by a Johns Manville Technical Representative. All materials supplied or marketed by Johns Manville will be covered under the terms and conditions of this agreement.

Thank you for your interest in our roofing products and services. Please contact Johns Manville if any information is incomplete or incorrect so that appropriate modifications can be made.

Johns Manville Technical Services
Roofing Systems Group
10100 W Ute Ave
Littleton, CO 80127
800-922-5922 Option 3

Johns Manville is a manufacturer of commercial roofing products and offers this general conceptual information to you as a courtesy. This complimentary assistance is not to be used or relied upon by anyone as a substitute for professional engineering design or documentation required by building code, contract or applicable law. By accepting these comments you agree they do not constitute any representations, endorsements of, or an assumption by Johns Manville of any liability for either the adequacy of the design of this building or of any material not supplied by Johns Manville. These comments are for Johns Manville Guarantee purposes only. Additional requirements may be necessary as determined by contract documents, building code and regulations, or governing entity.

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. Multiple Contract Summary - Prepared by Savin Engineers, P.C.3 Campus Drive Pleasantville, NY 10570 - Tel. (914)-769-3200
- B. Milestone Schedule - Prepared by Savin Engineers, P.C.3 Campus Drive Pleasantville, NY 10570 - Tel. (914)-769-3200
- C. Schedule of Allowances - Prepared by Savin Engineers, P.C.3 Campus Drive Pleasantville, NY 10570 - Tel. (914)-769-3200
- D. Temporary Facilities and Controls - Prepared by Savin Engineers, P.C.3 Campus Drive Pleasantville, NY 10570 - Tel. (914)-769-3200
- E. Pre-Construction Survey, Bulk Sampling and Analysis of Suspect Asbestos Containing Materials - Prepared by WSP, 500 Summit Lake Drive, Suite 450 Valhalla, NY 20595 - Tel. (914) 747-1120. Document follows this section.
- F. Roof Assessment Report - Prepared by Moseley Associates. Document follows this section.
- G. Roof Assembly Letters - Document follows this section.

END OF SECTION

Phase 1 Bond Improvements at Briarcliff Manor MS/HS and Todd Elementary School**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 **Briarcliff Manor Union Free School District, Town of Briarcliff Manor**, 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.

Fifth: Single Prime Contracts: Where the project cost does not exceed \$1,500,000 and the Owner has decided to solicit bids from one general contractor, the Bidder shall submit with its bid a separate sealed list that names each subcontractor that the bidder will use to perform work in the contract, and the agreed-upon amount to be paid to each, for: (A) Plumbing and gas fitting; (B) Steam heating, hot water heating, ventilating and air condition apparatus and (C) Electric wiring and standard illuminating fixtures.

After the low bid is announced, the sealed list of subcontractors submitted with such low bid shall be opened and the names of such subcontractors shall be announced, and thereafter any change of subcontractor or agreed-upon amount to be paid to each shall require the approval of the public

BRIARCLIFF MANOR UNION FREE SCHOOL DISTRICT**BID PROPOSAL FORM**

owner, upon a showing presented to the public owner of legitimate construction need for such change, which shall be open to public inspection.

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: _____

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:

**Phase 1 Bond Improvements at Briarcliff Manor MS/HS and Todd
Elementary School**

in strict accordance with the contract documents:

BASE BID GC-1 GENERAL CONSTRUCTION CONTRACT

BRIARCLIFF MANOR UNION FREE SCHOOL DISTRICT**BID PROPOSAL FORM**

The General Contractor shall state the complete price to perform all work including, but not limited to, all abatement, demolition, general construction, related to the **High School and Middle School** Interior reconstruction, as shown on the drawings, and specified herein.

BASE BID GC-1 BID PRICE = \$ _____

Lump Sum Allowance No. 1A = \$ _____ \$15,000
Unforeseen Conditions (See Section 1020)

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

BASE BID GC-2 GENERAL CONSTRUCTION CONTRACT
(SINGLE PRIME CONTRACT)

The General Contractor shall state the complete price to perform all work including, but not limited to, all abatement, demolition, general construction, mechanical construction, plumbing construction and electrical construction related to the **High School, Middle School, & Todd Elementary School** Interior reconstruction, as shown on the drawings, and specified herein.

BASE BID GC-2 BID PRICE = \$ _____

Lump Sum Allowance No. 2A = \$ _____ \$45,000
Unforeseen Conditions (See Section 1020)

TOTAL GENERAL CONSTRUCTION (SINGLE PRIME)

BASE BID GC-2 BID PRICE = \$ _____

Total Construction Base Bid GC-2 Price written in dollars and cents

\$ _____

Total Construction Base Bid GC-2 Price written in words

BASE BID MC-1 MECHANICAL CONSTRUCTION CONTRACT

The Mechanical Contractor shall state the complete price to perform all work including, but not limited to, all demolition mechanical construction & plumbing construction at the **High School, Middle School & Todd Elementary School**, as shown on the drawings and specified herein.

BASE BID MC-1 BID PRICE = \$ _____

Lump Sum Allowance No. 3A = \$ _____ \$15,000
Unforeseen Conditions (See Section 1020)

TOTAL MECHANICAL CONSTRUCTION

BASE BID MC-1 BID PRICE = \$ _____

Total Construction Base Bid MC-1 Price written in dollars and cents

\$ _____
Total Construction Base Bid MC-1 Price written in words

BASE BID EC-1 ELECTRICAL CONSTRUCTION CONTRACT

The Electrical Contractor shall state the complete price to perform all work including, but not limited to, all demolition and electrical construction at the **High School, Middle School & Todd Elementary School**, as shown on the drawings and specified herein.

BASE BID EC-1 BID PRICE = \$ _____

Lump Sum Allowance No. 4A = \$ _____ \$15,000
Unforeseen Conditions (See Section 1020)

TOTAL ELECTRICAL CONSTRUCTION

BASE BID EC-1 BID PRICE = \$ _____

Total Construction Base Bid EC-1 Price written in dollars and cents

\$ _____
Total Construction Base Bid EC-1 Price written in words

BASE BID RC-1 ROOFING CONSTRUCTION CONTRACT

The Roofing Contractor shall state the complete price to perform all work including, but not limited to, all demolition, roof construction, at the **Todd Elementary School roof**, as shown on the drawings and specified herein.

BASE BID RC-1 BID PRICE = \$ _____

Lump Sum Allowance No. 5A = \$ _____ \$15,000
Unforeseen Conditions (See Section 1020)

TOTAL ROOFING CONSTRUCTION

BASE BID RC-1 BID PRICE = \$ _____

Total Construction Base Bid RC-1 Price written in dollars and cents

\$ _____

Total Construction Base Bid RC-1 Price written in words

BASE BID RC-2a ROOFING CONSTRUCTION CONTRACT

The Roofing Contractor shall state the complete price to perform all work including, but not limited to, all abatement, demolition, roof construction, at the **High School roof**, as shown on the drawings and specified herein.

BASE BID RC-2a BID PRICE = \$ _____

Lump Sum Allowance No. 6A = \$ _____ \$50,000
Unforeseen Conditions (See Section 1020)

TOTAL ROOFING CONSTRUCTION

BASE BID RC-2a BID PRICE = \$ _____

Total Construction Base Bid RC-2a Price written in dollars and cents

\$ _____

Total Construction Base Bid RC-2a Price written in words

BASE BID RC-2b ROOFING CONSTRUCTION CONTRACT

The Roofing Contractor shall state the complete price to perform all work including, but not limited to, all demolition, roof construction, at the **Middle School roof**, as shown on the drawings and specified herein.

BASE BID RC-2b BID PRICE = \$ _____

Lump Sum Allowance No. 7A = \$ _____ \$35,000
Unforeseen Conditions (See Section 1020)

TOTAL ROOFING CONSTRUCTION

BASE BID RC-2b BID PRICE = \$ _____
Total Construction Base Bid RC-2b Price written in dollars and cents

\$ _____
Total Construction Base Bid RC-2b Price written in words

BASE BID RC-3 ROOFING CONSTRUCTION CONTRACT

The Roofing Contractor shall state the complete price to perform all work including, but not limited to, all abatement, demolition, roof construction, at the **High School & Middle School roofs**, as shown on the drawings and specified herein.

BASE BID RC-3 BID PRICE = \$ _____

Lump Sum Allowance No. 8A = \$ _____ \$75,000
Unforeseen Conditions (See Section 1020)

TOTAL ROOFING CONSTRUCTION

BASE BID RC-3 BID PRICE = \$ _____
Total Construction Base Bid RC-3 Price written in dollars and cents

\$ _____
Total Construction Base Bid RC-3 Price written in words

BRIARCLIFF MANOR UNION FREE SCHOOL DISTRICT**BID PROPOSAL FORM**

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.

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:

Board of Education, Briarcliff Manor UFSD 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

IF A FIRM:

NAME OF MEMBERS

ADDRESS

PROPOSED EQUIVALENT FORM

Project: Phase 1 Bond Improvements at Briarcliff Manor MS/HS and Todd ES

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
EquivalentThis image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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) has 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

Company: (Corporate Seal)

SURETY

Company: (Corporate Seal)

Signature: _____

Name and

Title:

(Any additional signatures appear on the last page of this Payment Bond.)

Signature: _____

Name and

Title:

(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

Company: _____ (Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____

SURETY

Company: _____ (Corporate Seal)

Signature: _____
Name and Title: _____
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

Company: (Corporate Seal)

SURETY

Company: (Corporate Seal)

Signature: _____

Name and

Title:

(Any additional signatures appear on the last page of this Performance Bond.)

Signature: _____

Name and

Title:

(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.

Init.

§ 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

Company: _____ (Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____

SURETY

Company: _____ (Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____

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AIA[®] Document A132[™] – 2009

Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition

AGREEMENT made as of the _____ day of _____ in the year _____
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

and the Contractor:
(Name, legal status, address and other information)

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

The Construction Manager:
(Name, legal status, address and other information)

The Architect:
(Name, legal status, address and other information)

BBS Architects, Landscape Architects and Engineers P.C.
244E Main Street
Patchogue, New York 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. 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.

This document is intended to be used in conjunction with AIA Documents A232[™]–2009, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132[™]–2009, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132[™]–2009, Standard Form of Agreement Between Owner and Construction Manager as Adviser.

AIA Document A232[™]–2009 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

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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, 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.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.

(Insert the date of commencement, if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)

If, prior to the commencement of the Work, the Owner requires time to file mortgages, mechanics' liens and other security interests, the Owner's time requirement shall be as follows:

§ 3.2 The Contract Time shall be measured from the date of commencement.

§ 3.3 The Contractor shall achieve Substantial Completion of the entire Work not later than () days from the date of commencement, or as follows:

(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. If appropriate, insert requirements for earlier Substantial Completion of certain portions of the Work.)

Portion of the Work

Substantial Completion Date

, subject to adjustments of this Contract Time as provided in the Contract Documents.

(Insert provisions, if any, for liquidated damages relating to failure to achieve Substantial Completion on time or for bonus payments for early completion of the Work.)

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.)

☐ Stipulated Sum, in accordance with Section 4.2 below

☐ Cost of the Work plus the Contractor's Fee without a Guaranteed Maximum Price, 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. Based on the selection above, also complete either Section 5.1.4, 5.1.5 or 5.1.6 below.)

§ 4.2 Stipulated Sum

§ 4.2.1 The Stipulated Sum shall be (\$), subject to additions and deletions as provided in the Contract Documents.

§ 4.2.2 The Stipulated Sum is based on the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:

(State the numbers or other identification of accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

§ 4.2.3 Unit prices, if any:

(Identify and state the unit price, and state the quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)
------	-----------------------	-------------------------

§ 4.2.4 Allowances included in the Stipulated Sum, if any:

(Identify allowance and state exclusions, if any, from the allowance price.)

Item	Allowance
------	-----------

§ 4.3 Cost of the Work Plus Contractor's Fee without a Guaranteed Maximum Price

§ 4.3.1 The Contract Sum is the Cost of the Work as defined in Exhibit A, Determination of the Cost of the Work, plus the Contractor's Fee.

§ 4.3.2 The Contractor's Fee:

(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)

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§ 4.3.3 The method of adjustment of the Contractor's Fee for changes in the Work:

§ 4.3.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:

§ 4.3.5 Rental rates for Contractor-owned equipment shall not exceed percent (%) of the standard rate paid at the place of the Project.

§ 4.3.6 Unit prices, if any:

(Identify and state the unit price; state quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)
------	-----------------------	-------------------------

§ 4.3.7 The Contractor shall prepare and submit to the Construction Manager for the Owner, in writing, a Control Estimate within 14 days of executing this Agreement. The Control Estimate shall include the items in Section A.1 of Exhibit A, Determination of the Cost of the Work.

§ 4.4 Cost of the Work Plus Contractor's Fee with a Guaranteed Maximum Price

§ 4.4.1 The Contract Sum is the Cost of the Work as defined in Exhibit A, Determination of the Cost of the Work, plus the Contractor's Fee.

§ 4.4.2 The Contractor's Fee:

(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)

§ 4.4.3 The method of adjustment of the Contractor's Fee for changes in the Work:

§ 4.4.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:

§ 4.4.5 Rental rates for Contractor-owned equipment shall not exceed percent (%) of the standard rate paid at the place of the Project.

§ 4.4.6 Unit Prices, if any:

(Identify and state the unit price, and state the quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)
------	-----------------------	-------------------------

§ 4.4.7 Guaranteed Maximum Price

§ 4.4.7.1 The sum of the Cost of the Work and the Contractor's Fee is guaranteed by the Contractor not to exceed (\$), subject to additions and deductions by changes in the Work as provided in the Contract Documents. Such maximum sum is referred to in the Contract Documents as the Guaranteed Maximum Price. Costs which would cause the Guaranteed Maximum Price to be exceeded shall be paid by the Contractor without reimbursement by the Owner.

(Insert specific provisions if the Contractor is to participate in any savings.)

§ 4.4.7.2 The Guaranteed Maximum Price is based on the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:

§ 4.4.7.3 Allowances included in the Guaranteed Maximum Price, if any:
(Identify and state the amounts of any allowances, and state whether they include labor, materials, or both.)

Item	Allowance
------	-----------

§ 4.4.7.4 Assumptions, if any, on which the Guaranteed Maximum Price is based:

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, or as follows:

§ 5.1.3 Provided that an Application for Payment is received by the Construction Manager not later than the day of a month, the Owner shall make payment of the certified amount in the Application for Payment to the Contractor not later than the day of the month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment shall be made by the Owner not later than () days after the Construction Manager receives the Application for Payment.

(Federal, state or local laws may require payment within a certain period of time.)

§ 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.

§ 5.1.4.3 Subject to the provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

- .1 Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the total Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of percent (%). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute may be included as provided in Section 7.3.9 of the General Conditions;
- .2 Add 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), less retainage of percent (%);
- .3 Subtract the aggregate of previous payments made by the Owner; and

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- .4 Subtract amounts, if any, for which the Construction Manager or Architect has withheld or nullified a Certificate for Payment as provided in Section 9.5 of the General Conditions.

§ 5.1.4.4 The progress payment amount determined in accordance with Section 5.1.4.3 shall be further modified under the following circumstances:

- .1 Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to percent (%) of the Contract Sum, less such amounts as the Construction Manager recommends and the Architect determines for incomplete Work and unsettled claims; and
- .2 Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Section 9.10.3 of the General Conditions.

§ 5.1.4.5 Reduction or limitation of retainage, if any, shall be as follows:

(If it is intended, prior to Substantial Completion of the entire Work, to reduce or limit the retainage resulting from the percentages inserted in Sections 5.1.4.3.1 and 5.1.4.3.2 above, and this is not explained elsewhere in the Contract Documents, insert here provisions for such reduction or limitation.)

§ 5.1.5 Progress Payments Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price

§ 5.1.5.1 With each Application for Payment, the Contractor shall submit the cost control information required in Exhibit A, Determination of the Cost of the Work, along with payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached and any other evidence required by the Owner, Construction Manager or Architect to demonstrate that cash disbursements already made by the Contractor on account of the Cost of the Work equal or exceed (1) progress payments already received by the Contractor; less (2) that portion of those payments attributable to the Contractor's Fee; plus (3) payrolls for the period covered by the present Application for Payment.

§ 5.1.5.2 Applications for Payment shall show the Cost of the Work actually incurred by the Contractor through the end of the period covered by the Application for Payment and for which the Contractor has made or intends to make actual payment prior to the next Application for Payment.

§ 5.1.5.3 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

- .1 Take the Cost of the Work as described in Exhibit A, Determination of the Cost of the Work;
- .2 Add the Contractor's Fee, less retainage of percent (%). The Contractor's Fee shall be computed upon the Cost of the Work described in that Section at the rate stated in that Section; or if the Contractor's Fee is stated as a fixed sum, an amount which bears the same ratio to that fixed-sum Fee as the Cost of the Work bears to a reasonable estimate of the probable Cost of the Work upon its completion;
- .3 Subtract retainage of percent (%) from that portion of the Work that the Contractor self-performs;
- .4 Subtract the aggregate of previous payments made by the Owner;
- .5 Subtract the shortfall, if any, indicated by the Contractor in the documentation required by Article 5 or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and
- .6 Subtract amounts, if any, for which the Construction Manager or Architect has withheld or withdrawn a Certificate for Payment as provided in Section 9.5 of AIA Document A232™–2009, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition.

§ 5.1.5.4 The Owner, Construction Manager and Contractor shall agree upon (1) a mutually acceptable procedure for review and approval of payments to Subcontractors and (2) the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.

§ 5.1.5.5 In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and shall not be deemed to represent that the Construction Manager and Architect have made a detailed examination, audit or arithmetic verification of the documentation submitted in accordance with Article 5 or other supporting data; that the Construction Manager and Architect have made exhaustive or continuous on-site inspections; or that the Construction Manager and Architect have made examinations to ascertain how or for what purposes the Contractor has used

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amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

§ 5.1.5.6 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.1.6 Progress Payments Where the Contract Sum is Based on the Cost of the Work with a Guaranteed Maximum Price

§ 5.1.6.1 With each Application for Payment, the Contractor shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner or Architect to demonstrate that cash disbursements already made by the Contractor on account of the Cost of the Work equal or exceed (1) progress payments already received by the Contractor; less (2) that portion of those payments attributable to the Contractor's Fee; plus (3) payrolls for the period covered by the present Application for Payment.

§ 5.1.6.2 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.

§ 5.1.6.3 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. The percentage of completion shall be the lesser of (1) the percentage of that portion of the Work which has actually been completed; or (2) the percentage obtained by dividing (a) the expense that has actually been incurred by the Contractor on account of that portion of the Work for which the Contractor has made or intends to make actual payment prior to the next Application for Payment by (b) the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values.

§ 5.1.6.4 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

- .1 Take that portion of the Guaranteed Maximum Price properly allocable to completed Work as determined by multiplying the percentage of completion of each portion of the Work by the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values. Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.10 of AIA Document A232-2009;
- .2 Add that portion of the Guaranteed Maximum Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work, or if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing;
- .3 Add the Contractor's Fee, less retainage of percent (%). The Contractor's Fee shall be computed upon the Cost of the Work at the rate stated in Section 4.4.2 or, if the Contractor's Fee is stated as a fixed sum in that Section, shall be an amount that bears the same ratio to that fixed-sum fee as the Cost of the Work bears to a reasonable estimate of the probable Cost of the Work upon its completion;
- .4 Subtract retainage of percent (%) from that portion of the Work that the Contractor self-performs;
- .5 Subtract the aggregate of previous payments made by the Owner;
- .6 Subtract the shortfall, if any, indicated by the Contractor in the documentation required by Section 5.1.6.1 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and
- .7 Subtract amounts, if any, for which the Construction Manager or Architect have withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A232-2009.

§ 5.1.6.5 The Owner and the Contractor shall agree upon a (1) mutually acceptable procedure for review and approval of payments to Subcontractors and (2) the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.

§ 5.1.6.6 In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and shall not be deemed to represent that the Construction Manager or Architect have made a detailed examination, audit or arithmetic verification of the documentation submitted in accordance with Section 5.1.6.1 or other supporting data; that the

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Construction Manager or Architect have made exhaustive or continuous on-site inspections; or that the Construction Manager or Architect have made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

§ 5.1.6.7 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 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 Section 12.2 of AIA Document A232–2009, and to satisfy other requirements, if any, which extend beyond final payment;
- .2 the Contractor has submitted a final accounting for the Cost of the Work, pursuant to Exhibit A, Determination of the Cost of the Work when payment is on the basis of the Cost of the Work, with or without a Guaranteed Maximum payment; and
- .3 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect; such final payment shall be made by the Owner not more than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment, or as follows:

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as Initial Decision Maker pursuant to Section 15.2 of AIA Document A232–2009, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Section 15.3 of AIA Document A232–2009, the method of binding dispute resolution shall be as follows:

(Check the appropriate box. If the Owner and Contractor do not select a method of binding dispute resolution below, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.)

- ☐ Arbitration pursuant to Section 15.4 of AIA Document A232–2009.
- ☐ Litigation in a court of competent jurisdiction.
- ☐ 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 A232–2009.

§ 7.1.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2009.

§ 7.2 Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price
§ 7.2.1 Subject to the provisions of Section 7.2.2 below, the Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2009.

§ 7.2.2 The Contract may be terminated by the Owner for cause as provided in Article 14 of AIA Document A232–2009; however, the Owner shall then only pay the Contractor an amount calculated as follows:

- .1 Take the Cost of the Work incurred by the Contractor to the date of termination;
- .2 Add the Contractor's Fee computed upon the Cost of the Work to the date of termination at the rate stated in Sections 4.3.2 or 4.4.2, as applicable, or, if the Contractor's Fee is stated as a fixed sum, an amount that bears the same ratio to that fixed-sum Fee as the Cost of the Work at the time of termination bears to a reasonable estimate of the probable Cost of the Work upon its completion; and
- .3 Subtract the aggregate of previous payments made by the Owner.

§ 7.2.3 If the Owner terminates the Contract for cause when the Contract Sum is based on the Cost of the Work with a Guaranteed Maximum Price, and as provided in Article 14 of AIA Document A232–2009, the amount, if any, to be paid to the Contractor under Section 14.2.4 of AIA Document A232–2009 shall not cause the Guaranteed Maximum Price to be exceeded, nor shall it exceed the amount calculated in Section 7.2.2.

§ 7.2.4 The Owner shall also pay the Contractor fair compensation, either by purchase or rental at the election of the Owner, for any equipment owned by the Contractor that the Owner elects to retain and that is not otherwise included in the Cost of the Work under Section 7.2.1. To the extent that the Owner elects to take legal assignment of subcontracts and purchase orders (including rental agreements), the Contractor shall, as a condition of receiving the payments referred to in this Article 7, execute and deliver all such papers and take all such steps, including the legal assignment of such subcontracts and other contractual rights of the Contractor, as the Owner may require for the purpose of fully vesting in the Owner the rights and benefits of the Contractor under such subcontracts or purchase orders.

§ 7.2.5 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2009; in such case, the Contract Sum and Contract Time shall be increased as provided in Section 14.3.2 of AIA Document A232–2009, except that the term 'profit' shall be understood to mean the Contractor's Fee as described in Sections 4.3.2 and 4.4.2 of this Agreement.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2009 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

%

§ 8.3 The Owner's representative:
(Name, address and other information)

§ 8.4 The Contractor's representative:
(Name, address and other information)

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§ 8.5 Neither the Owner's nor the Contractor's representative shall be changed without ten days written notice to the other party.

§ 8.6 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated in the sections below.

§ 9.1.1 The Agreement is this executed AIA Document A132–2009, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition.

§ 9.1.2 The General Conditions are, AIA Document A232–2009, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition.

§ 9.1.3 The Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
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§ 9.1.4 The Specifications:

(Either list the Specifications here or refer to an exhibit attached to this Agreement.)

Section	Title	Date	Pages
---------	-------	------	-------

§ 9.1.5 The Drawings:

(Either list the Drawings here or refer to an exhibit attached to this Agreement.)

Number	Title	Date
--------	-------	------

§ 9.1.6 The Addenda, if any:

Number	Date	Pages
--------	------	-------

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 9.

§ 9.1.7 Additional documents, if any, forming part of the Contract Documents are:

- 1 AIA Document A132™–2009, Exhibit A, Determination of the Cost of the Work, if applicable.
- 2 AIA Document E201™–2007, Digital Data Protocol Exhibit, if completed, or the following:

- 3 AIA Document E202™–2008, Building Information Modeling Protocol Exhibit, if completed, or the following:

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- 4 Other documents, if any, listed below:
(List here any additional documents which are intended to form part of the Contract Documents. AIA Document A232–2009 provides that bidding requirements such as advertisement or invitation to bid, Instructions to Bidders, sample forms and the Contractor’s bid are not part of the Contract Documents unless enumerated in this Agreement. They should be listed here only if intended to be part of the Contract Documents.)

ARTICLE 10 INSURANCE AND BONDS

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A232–2009.

(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A232–2009.)

Type of Insurance or Bond

Limit of Liability or Bond Amount (\$0.00)

This Agreement is entered into as of the day and year first written above.

OWNER (Signature)

CONTRACTOR (Signature)

(Printed name and title)

(Printed name and title)

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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.

Application and Certificate for Payment, Construction Manager as Adviser Edition

TO OWNER:

PROJECT: Tenpalte

APPLICATION NO:

DISTRIBUTION TO:
OWNER
CONSTRUCTION MANAGER
ARCHITECT
CONTRACTOR
FIELD
OTHER

FROM
CONTRACTOR:
CONTRACT FOR: General Construction

VIA CONSTRUCTION
MANAGER:
VIA ARCHITECT:

PERIOD TO:
CONTRACT DATE:
PROJECT NOS: / /

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 \$ 0.00

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.

Continuation Sheet

AIA Document, G702TM–1992, Application and Certification for Payment, or G736TM–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:

[illegible]



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.

SAMPLE

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 on the 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



AIA[®] Document G706[™] – 1994

Contractor's Affidavit of Payment of Debts and Claims

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

OWNER: ☐

ARCHITECT: ☐

CONTRACTOR: ☐

SURETY: ☐

OTHER: ☐

TO OWNER: *(Name and address)*

CONTRACT FOR:

CONTRACT DATED:

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: <i>(Name and address)</i>	ARCHITECT'S PROJECT NUMBER:	OWNER: <input type="checkbox"/>
	CONTRACT FOR:	ARCHITECT: <input type="checkbox"/>
TO OWNER: <i>(Name and address)</i>	CONTRACT DATED:	CONTRACTOR: <input type="checkbox"/>
		SURETY: <input type="checkbox"/>
		OTHER: <input type="checkbox"/>

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of Surety)

on bond of
(Insert name and address of Contractor)

, SURETY,

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)

, CONTRACTOR,

as set forth in said Surety's bond.

, OWNER,

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)

(Printed name and title)

Attest:
(Seal):



AIA[®] Document G707A[™] – 1994

Consent of Surety to Reduction in or Partial Release of Retainage

PROJECT: <i>(Name and address)</i>	ARCHITECT'S PROJECT NUMBER:	OWNER: <input type="checkbox"/>
	CONTRACT FOR: n	ARCHITECT: <input type="checkbox"/>
TO OWNER: <i>(Name and address)</i>	CONTRACT DATED:	CONTRACTOR: <input type="checkbox"/>
		SURETY: <input type="checkbox"/>
		OTHER: <input type="checkbox"/>

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of Surety)

on bond of
(Insert name and address of 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)

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)

(Printed name and title)

Attest:
(Seal):



AIA®

Document A232™ – 2009

General Conditions of the Contract for Construction, Construction Manager as Adviser Edition

for the following PROJECT:

(Name, and location or address)

THE CONSTRUCTION MANAGER:

(Name, legal status and address)

THE OWNER:

(Name, legal status and address)

THE ARCHITECT:

(Name, legal status and address)

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.

This document is intended to be used in conjunction with AIA Documents A132™–2009, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition; B132™–2009, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2009, Standard Form of Agreement Between Owner and Construction Manager as Adviser.

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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 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. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of addenda relating to bidding requirements).

§ 1.1.2 The Contract. The Contract Documents form the Contract for Construction. 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.

§ 1.1.3 The Work. The term "Work" means the construction and services required by the Contract Documents, 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.

§ 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 Multiple Prime Contractors and by the Owner's own forces, including persons or entities under separate contracts not administered by the Construction Manager.

§ 1.1.5 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.

§ 1.1.6 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.

§ 1.1.7 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.

§ 1.1.8 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 and certify termination of the Agreement under Section 14.2.2.

§ 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.

§ 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.

§ 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.

§ 1.3 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 will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect, or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them 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 material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

§ 1.6 Transmission of Data in Digital Form

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

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 Article 4, 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. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Information and Services Required of the Owner

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or

the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities. Unless otherwise provided under the Contract Documents, the Owner, through the Construction Manager, shall secure and pay for the building permit.

§ 2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.2.6 The Owner shall endeavor to forward all communications to the Contractor 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.

§ 2.3 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, 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, except to the extent required by Section 6.1.3.

§ 2.4 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 and fails within a ten-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, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Construction Manager's and Architect's and their respective consultants' additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect, after consultation with the Construction Manager. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

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" 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.

§ 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.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Construction Manager and Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information submitted to the Construction Manager in such form as the Construction Manager and Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 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 Architect any nonconformity discovered by or made known to the Contractor as a request for information submitted to Construction Manager in such form as the Construction Manager and Architect may require.

§ 3.2.4 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 requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, 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 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.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. 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 under the Contract, unless the Contract Documents give other specific instruction concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner, the Construction Manager, and the Architect and shall not proceed with that portion of the Work without further written instructions from the Architect, through the Construction Manager. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 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.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, 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.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 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 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.

§ 3.5 Warranty

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 with 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 may 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. If required by the Construction Manager or Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 Taxes

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.

§ 3.7 Permits, Fees, Notices, and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Owner, through the Construction Manager, shall secure and pay for the building permit. The Contractor shall secure and pay for other permits, fees, licenses and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 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.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to 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 the costs attributable to correction.

§ 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 promptly provide notice to the Owner, Construction Manager, and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect and

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 Owner or Contractor disputes the Architect's determination or recommendation, either party may proceed as provided in Article 15.

§ 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 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; and
- .3 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.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner and Architect through the Construction Manager, the name and qualifications of a proposed superintendent. 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 the proposed superintendent or (2) that any of them require additional time to review. Failure of the Construction Manager to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner, Construction Manager or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction Schedules

§ 3.10.1 The Contractor, promptly 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. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at

appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project schedule to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work. 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.

§ 3.10.2 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.

§ 3.10.3 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 make revisions to the construction schedule and submittal schedule as deemed necessary by the Construction Manager to conform to the Project schedule.

§ 3.10.4 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner, Construction Manager and Architect and incorporated into the approved Project schedule.

§ 3.11 Documents and Samples at the Site

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.

§ 3.12 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.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams 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 demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents 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 4.2.9 through 4.2.11. 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.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit 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 Multiple Prime 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 Multiple Prime Contractors.

§ 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.

§ 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.

§ 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.

§ 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. 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 cause such services or certifications to be provided by a properly 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, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, 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. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 Use of Site

§ 3.13.1 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.

§ 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.

§ 3.14 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 and patching shall be restored to the condition existing prior to the cutting, fitting and 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's own forces or of other Multiple Prime Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner's own forces or by other Multiple Prime Contractors except with written consent of the Construction Manager, Owner and such other Multiple Prime Contractors; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the other Multiple Prime Contractors or the Owner the Contractor's consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. 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.

§ 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.

§ 3.16 Access to Work

The Contractor shall provide the Owner, Construction Manager and Architect access to the Work in preparation and progress wherever located.

§ 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 such 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 the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such 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 indemnify and hold harmless the Owner, Construction Manager, Architect, Construction Manager's and Architect's consultants, and agents 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, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone 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. Such obligation shall not be construed to negate, abridge or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 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 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.

ARTICLE 4 ARCHITECT AND CONSTRUCTION MANAGER

§ 4.1 General

§ 4.1.1 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.

§ 4.1.2 The Owner shall retain a construction manager lawfully licensed to practice construction management or an entity 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.

§ 4.1.3 Duties, responsibilities and limitations of authority of the Construction Manager and Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Construction Manager, Architect and Contractor. Consent shall not be unreasonably withheld.

§ 4.1.4 If the employment of the Construction Manager or Architect is terminated, the Owner shall employ a successor construction manager or architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Construction Manager or Architect, respectively.

§ 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. The Construction Manager and Architect will have 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 reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner and Construction Manager (1) known deviations from the Contract Documents and from the most recent Project schedule prepared by the Construction Manager, and (2) defects and deficiencies observed in the Work.

§ 4.2.3 The Construction Manager shall provide a staffing plan to include 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 reasonably informed of the progress of the Work, and will report to the Owner and Architect (1) known deviations from the Contract Documents and the most recent Project schedule, and (2) defects and deficiencies observed in the Work.

§ 4.2.4 The Construction Manager will schedule and coordinate the activities of the Contractor and other Multiple Prime Contractors in accordance with the latest approved 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 The Construction Manager will receive and promptly review for conformance with the submittal requirements of the Contract Documents, all submittals from the Contractor such as Shop Drawings, Product Data and Samples. Where there are Multiple Prime Contractors, the Construction Manager will also check and coordinate the information contained within each submittal received from Contractor and other Multiple Prime Contractors, and transmit to the Architect those recommended for approval. By submitting Shop Drawings, Product Data, Samples and similar submittals, the Construction Manager represents to the Owner and Architect that the Construction Manager has reviewed and recommended them for approval. 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.

§ 4.2.10 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.

§ 4.2.11 Review of the Contractor's submittals by the Construction Manager and 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 Construction Manager and 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 Construction Manager and Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Construction Manager and 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 The Construction Manager will prepare Change Orders and Construction Change Directives.

§ 4.2.13 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.

§ 4.2.14 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.

§ 4.2.15 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.

§ 4.2.16 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.

§ 4.2.17 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.

§ 4.2.18 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. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions so rendered in good faith.

§ 4.2.19 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.20 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 Multiple Prime Contractors or subcontractors of other Multiple Prime 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, as soon as practicable 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.

§ 5.2.2 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 or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner, Construction Manager or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate agreement, written where legally required for validity, 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.

§ 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 for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; 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 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor Contractor or other entity. If the Owner assigns the subcontract to a successor Contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor Contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY OTHER 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. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

§ 6.1.2 When the Owner performs construction or operations with the Owner's own forces including persons or entities under separate contracts not administered by the Construction Manager, the Owner shall provide for coordination of such forces with the Work of the Contractor, who shall cooperate with them.

§ 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, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11 and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner's own forces, Construction Manager and other Multiple Prime 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.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner's own forces or other Multiple Prime Contractors, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Construction Manager and Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's own forces or other Multiple Prime Contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs, including costs that are payable to a separate contractor or to other Multiple Prime Contractors because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of delays, improperly timed activities, damage to the Work or defective construction by the Owner's own forces or other Multiple Prime Contractors.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner, separate contractors, or other Multiple Prime Contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and other Multiple Prime Contractors shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, other Multiple Prime 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, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 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; an order for a minor change in the Work may be issued by the Architect alone.

§ 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 order for a minor change in the Work.

§ 7.2 Change Orders

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.

§ 7.3 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.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides 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;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction Manager and Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.6 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.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Construction Manager shall determine the method and 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 the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. 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 7.3.7 shall be limited to the following:

- .1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers compensation insurance;
- .2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
- .5 Additional costs of supervision and field office personnel directly attributable to the change.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Construction Manager and Architect. 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.

§ 7.4 Minor Changes in the Work

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order issued through the Construction Manager and shall be binding on the Owner and Contractor.

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.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 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.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner, Owner's own forces, Construction Manager, Architect, any of the other Multiple Prime Contractors or an employee of any of them, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the Owner pending mediation and arbitration, or by other causes that the Architect, based on the recommendation of the Construction Manager, determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

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.

§ 9.2 Schedule of Values

Where the Contract is based on a Stipulated Sum or Guaranteed Maximum Price, the Contractor shall submit to the Construction Manager, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and 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. In the event there is one Contractor, the Construction Manager shall forward to the Architect the Contractor's schedule of values. If there are Multiple Prime Contractors responsible for performing different portions of the Project, the Construction Manager shall forward the Multiple Prime Contractors' schedules of values only if requested by the Architect.

§ 9.3 Applications for Payment

§ 9.3.1 At least fifteen days before the date established for each progress payment, the Contractor shall submit to the Construction Manager an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner, Construction Manager or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 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.

§ 9.3.1.2 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.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance 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, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 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.

§ 9.4 Certificates for Payment

§ 9.4.1 Where there is only one Contractor, the Construction Manager will, within seven 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 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 are Multiple Prime Contractors performing portions of the Project, the Construction Manager will, within seven days after the Construction Manager receives the Multiple Prime Contractors' Applications for Payment: (1) review the Applications and certify the amount the Construction Manager determines is due each of the Multiple Prime Contractors; (2) prepare a Summary of Contractors' Applications for Payment by combining information from each Multiple Prime Contractors' application with information from similar applications for progress payments from other Multiple Prime Contractors; (3) prepare a Project Application and Certificate for Payment; (4) certify the amount the Construction Manager determines is due all Multiple Prime Contractors; and (5) forward the Summary of Contractors' Applications for Payment and Project Application and Certificate for Payment to the Architect.

§ 9.4.3 Within seven 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 issue to the Owner a Project 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 the Architect's notice of withholding certification to the Contractors.

§ 9.4.4 The Construction Manager's certification of an Application for Payment or, in the case of Multiple Prime Contractors, a Project Application and Certificate 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.

§ 9.4.5 The Architect's issuance of a Certificate for Payment or in the case of Multiple Prime Contractors, Project Application and 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 or Project 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.

§ 9.4.6 The representations made pursuant to Sections 9.4.4 and 9.4.5 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.

§ 9.4.7 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 or Project 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 and 9.4.3. If the Contractor, Construction Manager and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment or a Project 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 or Project 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 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 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; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 If the Architect or Construction Manager withholds certification for payment under Section 9.5.1, 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.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment or Project Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Construction Manager and Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the 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 a similar manner.

§ 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 days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner, 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 Contractor payments to material and equipment 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 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, 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 the Construction Manager and Architect do not issue a Certificate for Payment or a Project Certificate for Payment, through no fault of the Contractor, within fourteen days after the Construction Manager's receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Construction Manager and Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner, Construction Manager and Architect, stop the Work until payment of the amount owing has been received. 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, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use.

§ 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 of items to be completed or corrected prior to final payment. 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 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.

§ 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 items on the list accompanying the Certificate. 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.

§ 9.9 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.

§ 9.10 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 terms and conditions of 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.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect through the Construction Manager (1) 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, (2) 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, (3) 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, (4) consent of surety, if any, to final payment and (5), 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. 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.

§ 9.10.3 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 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 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 shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents; or
- .3 terms of special warranties required by the Contract Documents.

§ 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 and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, 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.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury 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 or the Contractor's Subcontractors or Sub-subcontractors;
- .3 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; and
- .4 construction or operations by the Owner or other Contractors.

§ 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.

§ 10.2.3 The Contractor shall 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 owners and users of adjacent sites and utilities.

§ 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.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) 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.

§ 10.2.6 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 permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 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, written notice of such 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 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.

§ 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. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor, Construction Manager and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor, the Construction Manager and the Architect will promptly reply to the Owner in writing stating whether or not any of them has reasonable objection to the persons or entities proposed by the Owner. If the Contractor, Construction Manager or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor, the Construction Manager and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and 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, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Construction Manager, Architect, their consultants, and agents 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 such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 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 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 solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

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.

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 lawfully authorized to do business in the jurisdiction in which the Project is located 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;
- .2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- .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; and
- .7 Claims for bodily injury or property damage arising out of completed operations; and
- .8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, 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 the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be submitted to the Construction Manager for transmittal to the Owner with a copy to the Architect 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 Section 11.1 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 shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Construction Manager, the Construction Manager's consultants, the Owner, the Architect, and the

Architect's consultants as additional insureds 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 as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 11.2 Owner's Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 11.3 Property Insurance

§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, 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.

§ 11.3.1.1 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.

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.2 Boiler and Machinery Insurance. The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Construction Manager, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 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. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses 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 herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, adjoining or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy 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. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

§ 11.3.7 **Waivers of Subrogation.** The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees each of the other, and (2) the Construction Manager, Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by 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 as fiduciary. 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 the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be 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 had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or distribution of insurance proceeds in accordance with the direction of the arbitrators.

§ 11.4 Performance Bond and Payment Bond

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

§ 11.4.2 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.

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 observation 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 Substantial Completion

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 Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established under Section 9.9.1, or by terms of an 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 written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 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.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors or other Multiple Prime Contractors caused by the

Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 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 one-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 appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 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 such 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 such assignment.

§ 13.3 Written Notice

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity or to an officer of the corporation for which it was intended; or if delivered at or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 Rights and Remedies

§ 13.4.1 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.

§ 13.4.2 No action or failure to act by the Owner, Construction Manager, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

§ 13.5 Tests and Inspections

§ 13.5.1 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. Unless otherwise provided, the Contractor shall make arrangements 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.

§ 13.5.2 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 13.5.1, the Construction Manager and Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements 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 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 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.

§ 13.5.4 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.

§ 13.5.5 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.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.7 Time Limits on Claims

The Owner and the Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and the Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

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 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, 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;
- .2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;
- .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, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, 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, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner payment for Work executed including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 14.1.4 If the Work is stopped for a period of 60 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 seven additional days' written notice to the Owner, Construction Manager and Architect, 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 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, after consultation with the Construction Manager, and upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, 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 days' written notice, terminate employment of the Contractor 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;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. 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.

§ 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 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Construction Manager's and Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid 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 after consultation with the Construction Manager, and this obligation for payment shall survive termination of the Contract.

§ 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.

§ 14.3.2 The Contract Sum and the Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. 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 Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .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; and
- .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.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

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. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 Notice of Claims. Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Construction Manager and Architect, if the Construction Manager and or Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3 Continuing Contract Performance. Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. 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.

§ 15.1.4 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.

§ 15.1.5 Claims for Additional Time

§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary.

§ 15.1.5.2 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.

§ 15.1.6 Claims for Consequential Damages. The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, 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 excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no 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 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, 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 or to furnish additional supporting data, such party shall respond, within ten 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 in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, 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 mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim 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 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.



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Additions and Deletions Report for **AIA[®] Document A232[™] – 2009**

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

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There are no differences.

Certification of Document's Authenticity

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I, _____, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 12:14:50 on 07/12/2016 under Order No. 1767259550_1 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A232™ – 2009, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

(Signed)

(Title)

(Dated)

SUPPLEMENTARY GENERAL CONDITIONS OF THE CONTRACT

(CROSS-REFERENCE AIA DOCUMENT A232/CMA-2009)

1. List of Drawings

The Drawings, which are the graphic and pictorial portions of the Contract Documents that show the design, location and dimension of the Work are as listed within the "List of Drawings" provided with the drawing set. All Work under this Contract shall be executed in accordance with the Contract Documents, which are typically composed of the Project Manual, Specifications and Drawings. The Contract Documents are complimentary as described in the General Conditions. The "List of Drawings" will be incorporated in the Standard Form of Agreement Between the Owner and the Contractor.

2. Provision of Documents

- A. Each Prime Contractor is entitled to five printed sets of Drawings, three Project Manuals, and three sets of all Addenda materials. The three sets are inclusive of the original set obtained for bidding purposes. These sets will be provided at the Owners expense exclusive of the original Bid Deposit, which is forfeited by the awarded contractors.
- B. Additional sets of Contract Documents will be provided to the contractors for the cost of reproduction and distribution charges. Payment is due upon receipt of the Documents.
- C. Reproducible copies of the Drawings shall be provided upon the request of the Prime Contractor and are to be provided for the cost of reproduction and distribution charges. Payment is due upon receipt of the Documents.
- D. For expediency, at the discretion of the Architect, Prime Contractors 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.
- E. 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.

3. Minimum Rates of Wages

- A. In accordance with Section 220, Subdivision 3 and 220-d of the Labor Law, the Industrial Commissioner, Department of Labor, State of New

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York, has ascertained the prevailing rates of wages which will apply to this Project.

- B. The Prevailing Rates of Wages, which are the minimum hourly rates to be paid on this project, shall be indicated in the PW-3, PW-19, PW-202, PW-203, and PW-16 sheets enclosed.
 - C. Any person or corporation that willfully pays, after entering such contract, less than established wage schedule shall be guilty of a misdemeanor and, upon conviction, shall be punished for such first offense by a fine of \$500 or by imprisonment for not more than 30 days or both fined and imprisoned. A second offense carries a heavier penalty.
4. A.I.A. Documents
- A. The "General Conditions of the Contract for Construction" Standard A.I.A. Form A232CMA, 2009 edition, will become, under the Agreement, one of the Documents of the Contract and shall govern all Work under this Contract.
 - B. The following supplements modify the "General Conditions of the Contract for Construction," A.I.A. Document A232CMA, 2009 Edition. Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.
 - C. **Article 1 - General Provisions**

1.1 Basic Definitions

Add the following Subparagraph to 1.1.2:

- 1.1.2.1 Where the term "Contract" or "Prime Contract" is used in the General Conditions, Supplementary Conditions, and other Contract Documents, it shall mean the separate Owner-Contractor Agreement between the Owner and each Prime Contractor identified in Division 1.

1.2 Correlation and Intent of the Contract Documents

Add new subparagraph 1.2.4:

In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities.

- 1. Modifications issued after execution of the Agreement.
- 2. The Agreement Between the Owner and the Contractor.
- 3. Addenda, issued prior to the execution of the Agreement, with those of later dates having precedence over those of earlier dates.

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4. The Supplementary Conditions, Rider to the General Conditions, Special Provisions or Requirements (if any).
5. The General Conditions of the Contract for Construction.
6. Drawings and Specifications.

After execution of the Agreement and during the course of the Work should any ambiguities, discrepancies, omissions, or apparent errors be found on the drawings or in the specifications to which the Contractor has failed to call attention prior to submitting his bid, then the intention of the Contract Documents is to be interpreted by the Architect.

The Architect's decision as to the intent shall be final, and the Contractor hereby agrees to carry out the Work in accordance with the decision of the Architect.

Until such time as an interpretation is issued, it shall be assumed that the Contractor has based his bid on providing the Work in the better quality, greater quantity, or most expensive manner, for Work complete in every detail, even though every item necessarily involved is not particularly mentioned.

If necessary measurements are missing or Work specified or shown in the Contract Documents is obviously incorrect or impossible to execute, or figures fail to check, the Contractor shall call these facts to the attention of the Architect for interpretation as described above.

D. **Article 2 - Owner**

2.3 Owner's Right to Stop the Work

Add new subparagraph 2.3.1

- 2.3.1 "If the Contractor fails to correct Work which is not in accordance with the requirements of Contract Documents as required by Section 12.2 or 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 fails to remove and discharge (within ten days) any lien filed upon Owner's property by anyone claiming by, through, or under Contractor, or disregards, the instruction of the Architect, Construction Manager or Owner when based on the requirements of the Contract Documents, the Owner, by written order signed personally or by an agent so empowered by the Owner, may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated (as determined by the Owner or its agency); however, the

right of Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right either on its behalf or for the benefit of the Contractor or any other person or entity. The Contractor shall stop work upon receipt of said order the written order described herein above may be delivered to and shall be deemed received by the Contractor in the same manner as set forth in paragraph 2.4.1.1."

2.4 Owner's Right to Carry Out the Work

Add after second sentence of 2.4 the following sentence:

If the Owner, Architect or Construction Manager (if applicable) request that any of the Prime Contractors perform additional work which is not included in the Construction Documents and which will result in either additional cost or additional time a fully executed Change Order is required.

The Contractor shall submit a proposal for the additional work. This proposal shall contain a complete itemization of the costs associated with the work inclusive of all labor and materials. All proposals for any work that the Contractor, its Subcontractors or Subcontractors of subcontractors perform in connection with the additional work shall be submitted utilizing the format contained herein below (item 7.2.3). In no event shall the total for overhead and profit on any Change Order exceed fifteen percent (15%) of the cost of the work.

1. Any proposals submitted without an itemized breakdown as indicated herein will be returned for resubmission.
2. For work performed by the Prime Contractor, fifteen percent (15%) overhead and profit is permitted for their labor and material costs.
3. Overhead can only be applied to the cost of labor and materials, including delivery.
4. Overhead and profit is not permitted on rental of equipment and machinery.
5. Equipment and machinery costs shall not include items already on site and under use for the base contract.
6. Additional bond costs shall be 2 % maximum.
7. Insurance costs fall within overhead costs.
8. Subcontractor proposals in connection with the work shall include a maximum of ten percent (10%) overhead and profit for their work.

9. The Prime Contractor is permitted five percent (5%) profit on the work of its Subcontractor as indicated in the Table at 7.2.3.
10. Under no circumstance shall the Contractor or its Subcontractors be entitled to overtime costs unless otherwise agreed and approved by the Owner. (Ref Article 8 - Time)
11. A change in the Contract sum shall only be accomplished by a written Change Order. Payments cannot be issued against a Change Order unless it has been fully executed.
12. Adjustments in time if required will be in accordance with Article 8.

Proposals for additional work shall be submitted in the following format accompanied by sufficient substantiating data to permit a proper evaluation.

	Proposed Change Order	Estimated cost
A	Prime Contractors Materials (itemized quantities & cost)	
B	Prime Contractors Labor (itemized)	
C	Subtotal (A+B)	
D	Any credit due shall be applied here	
E	Overhead 10% of Subtotal	
F	Subtotal (C+D+-E)	
G	Subcontracted work (include itemized quantities and costs and 10% max OH&P)	
H	Subtotal (F+G)	
I	Prime Contractors Profit 5%	
J	Subtotal (H+I)	
K	Equipment and Machinery Rental (itemized)	
L	Bond Costs (2% max)	
M	Total Proposed Change Order (J+K+L)	

E. Article 3 - Contractor

3.2 Review of Contract Documents and Field Conditions by Contractor

Add new subparagraph 3.2.5:

- 3.2.5 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

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Work outlined therein in accordance with applicable laws, statues, building codes and regulations, and otherwise to fulfill all of its obligations under the Contract Documents. In addition, if the Contractor performs any construction activity and if it knows or should have know that any of the Contract Documents contains an error, inconsistency or omission, the Contractor shall be responsible for such performance and shall bear the costs for correction thereof.

3.3 Supervision and Construction Procedures:

3.3.2 Insert the following language (noted in *italic*) in Paragraph 3.3.2: *"...and other persons performing portions of the Work under a Contract or other arrangement with the Contractor."*

3.4 Labor and Materials:

Add the following Paragraphs to 3.4:

3.4.4 The Contractor shall check all materials and labor entering into the Work site and shall keep full detailed accounts thereof.

3.4.5 The Contractor acknowledges that it is the Contractor's responsibility to hire all personnel for the proper and diligent execution of the Work and the Contractor shall maintain labor peace for the duration of the Project. In the event of a labor dispute, the Contractor shall not be entitled to any increase in the Contract schedule of the Contract Sum.

3.5 Warranty:

Add the following at the end of 3.5.1:

The Contractor will be responsible for and shall make good any defects due to faulty materials for two (2) years and two (2) years on labor after final payment has been made, except where sections of the Specifications call for a longer period of time.

3.9 Superintendent:

Add the following new subparagraph:

3.9.8 Qualifications of Superintendent: The Contractor shall employ a Superintendent, for the duration of the Project, whose qualifications meet or exceed those listed below. Prior to employing the Superintendent, the Contractor shall submit to the Architect the name of the proposed Superintendent and, if requested by

the Architect, a statement attesting to his qualifications.

1. Five (5) years of experience as a Superintendent in the particular construction discipline required by the Contract.
2. Superintendent on at least two (2) construction projects equal to, or greater than, the Contract Sum for this Contract.
3. Superintendent on at least two (2) projects of similar construction types and procedures as this Project.

3.12 Shop Drawings, Product Data, and Samples:

Add the following to the end of paragraph 3.12.1:

"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."

Add the following to the end of paragraph 3.12.5:

"All submissions shall be in accordance with Section 01300 Submissions."

Add the following to the end of paragraph 3.12.6:

"Contractor shall be responsible for verification of field dimensions and conditions and shall furnish such information to the Architect when requested. Before Contractor proceeds with the Work in question, the Contractor should field verify all dimensions. In case of doubt about dimensions, he should notify the Architect immediately for instructions."

Add the following new Paragraphs to 3.12:

3.12.11 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.

F. **Article 5 - Subcontractors**

5.2 Award of Subcontracts and Other Contracts for Portions of the Work:

Add the following Subparagraphs to 5.2.1:

5.2.1.2 Refer to Instructions to Bidders, Section 4, for requirements for delivery of "Contractor's Subcontractor List" to Architect's office after receipt of bids and before award of the Contract."

Delete Subparagraph 5.2.3 in its entirety and substitute the following:

5.2.3 Approval of a subcontractor may be revoked or withdrawn, if, in the opinion of the Architect, such subcontractor evidences an unwillingness or inability to perform his Work in strict accordance with the Contract Documents.

Add the following Paragraph to 5.2:

5.2.5 All subcontracts over \$5,000 shall be in writing with copies of written subcontract provided to the Owner upon request.

G. **Article 6 - Construction by Owner or By Other Contractors**

6.1 Owner's Right to Perform Construction with Own Forces and to Award Other Contracts:

Add the following Subparagraph to 6.1.2:

6.1.2.1 The Contractor shall provide for coordination of his activities with the activities of each Prime Contractor. This includes, but is not limited to, the Owner's own forces or separate Contractor's employed directly by the Owner.

6.2 Mutual Responsibility:

Add the following Subparagraphs to 6.2.2:

6.2.2.1 Each Prime Contractor shall promptly correct discrepancies or defects in their Work identified by other Prime Contractors as affecting proper execution and results of the Work of the other Prime Contractor.

Add the following Subparagraph to 6.2.5:

- 6.2.5.1 Claims and other disputes and matters in questions between the Contractor and other Prime Contractors shall be subject to the provisions of Article 15.

Add the following new Subparagraphs:

- 6.2.6 All required cutting, patching, and restoring shall be neatly done by mechanics skilled in their specific trades, to the satisfaction of the Architect.
- 6.2.7 The Contractor shall leave all Work of his trade WHOLE, PERFECT, AND COMPLETE at the final completion of the Work.

H. **Article 8 - Time**

8.2 Progress and Completion:

Add the following Subparagraph to 8.2.1

- 8.2.1.1 The Contractor recognizes that the Project Schedule is of critical importance to the Owner. 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 or Architect, that the completion day may be in jeopardy, this will mandate Contractor(s) to increase staff, work overtime, or use other means to recover time, at the costs of those Contractor(s) 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.

8.3 Delays and Extensions of Time:

Delete Paragraph 8.3.1 and replace with the following:

- 8.3.1 "If the Contractor is delayed at/in its progress of the Work by one of the delays for which an extension of time is permitted and gives the Owners Representative written notice specifically describing the delay within 48 hours of its commencement, the date for the Substantial Completion of the Work will be extended by Change Order for such reasonable time as the Owner's Representative may determine. The failure to give such notice will constitute an irrevocable waiver of the Contractor's right to seek

an extension for such delay. The only delays for which the Contractor will be entitled to an extension of the time for completion will be delays caused by the Architect, Construction Manager, or the Owner, physical damage to the Project over which the Contractor has no control, labor disputes beyond the control of the Contractor, and unusually severe weather conditions not reasonably anticipated (temperature, rain, or other precipitation within a range of twenty percent of normal amounts for the time of the year covered by the Agreement shall not be considered unusually severe weather conditions) or by fire, unavoidable casualties or by other causes beyond the Contractors reasonable control. Extensions of time will only be granted pursuant to the procedures for Change Orders set forth in the General Conditions. The Contractor agrees not to make claims for financial compensation for delays or acceleration in the performance of the Work resulting from acts or failure to act by the Owner, the Architect, Construction Manager, or the employees, agents, or representatives of the Owner, Construction Manager, or the Architect and agrees that such claim shall be fully compensated by an extension of time to complete the Work, regardless of when granted. Contractor delayed by Work of other Contractors shall make claims against delaying Contractor and not the Owner."

Add the following Subparagraphs to 8.3.1:

8.3.1.4 When the Contract Time has been extended, as provided under this Paragraph 8.3, such extension of time shall not be considered as justifying extra compensation to the Contractor for administrative costs or other similar reasons.

Delete paragraph 8.3.2 and replace as follows:

8.3.2 Claims relating to time shall be made in accordance with applicable provisions of this Agreement. A copy of any Claim for extension of time shall be delivered to the Owner, the Architect and the Construction Manager, and the Contractor shall immediately take all steps reasonably possible to lessen the adverse impact of such delay to the Owner.

Delete paragraph 8.3.3 and replace as follows:

8.3.3 In no event shall the Contractor be entitled to monetary damages for delay under the Contract.

A new paragraph 8.3.4 shall be added as follows:

8.3.4 To the extent the Contractor is required to work during overtime hours, weekend, holidays or at other times which are not regularly scheduled, due to the fault of the Contractor, the Contractor shall be responsible for the costs incurred by the Owner, Architect, the Construction Manager and the others attributable to working during periods which have not been ordinarily scheduled. To the extent the Contractor elects to work during these periods to facilitate the schedule, the Owner may, at its sole option, allow the Contractor to do so without the Contractor incurring the additional costs referenced above.

I. **Article 9 - Payments and Completion**

9.2. Schedule of Values:

9.2.1 In the first sentence, after Construction Manager, add "and the Architect".

9.3 Application for Payment:

9.3.1 In the second sentence, delete the words "if required."

Add the following Subparagraphs to 9.3.1.3:

9.3.1.3.1 Until final completion and acceptance of Work in accordance with Paragraph 9.10, the Owner shall pay 95 percent of the amount of each progress payment due the Contractor.

9.3.1.3.2 The application for payment shall be accompanied by the following documentation:

- 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

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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.

- e. Such other information which the Owner and/or the Architect request the Contractor furnish in connection with its Application for Payment.

Add the following Subparagraphs to 9.3.2:

9.3.2.4 Additionally, the Contractor must furnish the following information, where payment is requested for materials and equipment stored off the project site, as part of its Application for Payment:

1. Type of material must be specifically identified by the trade contractor.
2. Trade contractor must furnish an invoice from his supplier showing the total value of the material and/or equipment being stored off site.
3. Trade contractor must provide a Certificate of Insurance for the full value of the item plus 10 percent.

9.10 Final Completion and Final Payment:

Add the following Subparagraphs to 9.10.1:

9.10.1.1 "In case the Contractor neglects to carry out the provisions of this clause within a reasonable time after notice, the Owner may cause all defects to be remedied and all repairs to be made without notice to the Contractor and deduct same from any amount so retained and recover the balance, if any, from the Contractor. The order of the Architect as to the conditions of the Work constructed under this Contract, the extent of the remedies applies, and of the repairs made, and of the cost thereof, shall be binding and conclusive upon the Contractor, his assigns, and sureties.

Add the following Subparagraph to 9.10.2:

9.10.2.2 Submittals required above shall be made in accordance with procedures described in Division 1.

Add the following additional Clauses to Paragraph 9.10.4:

- .4 Claims for Indemnification;

- .5 Claims about which the Owner has given the Contractor written notice;
- .6 Claims arising after final payment."

J. **Article 10 - Protection of Persons and Property**

10.2 Safety of Persons and Property:

Add the following Subparagraph to 10.2.2:

- 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 to 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.

Add the following new Subparagraph:

- 10.2.12 Title to all completed or partially completed Work at the job site and to all materials delivered to and stored at said job site which are intended to become a part of the completed Work covered by the Contract, shall be in the name of the Owner. Notwithstanding the foregoing, prior to the acceptance of the completed Work by the Owner, the Contractor shall be liable for all loss of, or damage to, said completed Work, partially completed Work, materials furnished by the Contractor, and materials or equipment furnished by others, the custody of which has been given to the Contractor arising from any cause other than a cause against which the Owner herein undertakes to carry insurance. In the event of loss or damage from cause other than those against which the Owner undertakes to carry insurance, the Contractor shall replace or repair the said Work materials at his own cost and expense, to the completed satisfaction of the Owner

and Architect.

Add the following Subparagraph to 10.2.12:

- 10.2.12.1 The Contractor causing damage to the Work of another Contractor shall be responsible for the repair and replacement of such damaged Work. Back charges shall be made when corrections are not made promptly.
- 10.2.12.2 The Owner reserves the right to pay the Contractor originating the back charge from monies due the Contractor who is responsible for the Work required by same and shall deduct it from the amount due the said responsible Contractor.
- 10.2.12.3 Contractor originating back charges will determine the amount of the back charges in accordance with Article 7, Changes in the Work, of the General Conditions of the Contract, in order to obtain the Architect's approval.
- 10.2.12.4 Contractors under direct Contract with the Owner will be expected to take care of back charges originating with Subcontractors under their employ under the terms and conditions as established in the General Conditions of the Contract, Article 5 and Article 6. Contractors under direct Contract with the Owner, and their Sureties, shall indemnify and save the Owner harmless from claims of this type, including paying for legal expenses necessary to remove or settle any liens or other legal claims against the Owner.

K. **Article 11 - Insurance and Bonds**

11.1 Contractor's Liability Insurance:

Add the following Subparagraph to 11.1.2:

- 11.1.2.1 The insurance required by Subparagraph 11.1.1 shall be written for not less than limits indicated in Division 1, Section 1C (submitted on A.I.A. Document G705, Certificate of Insurance) or greater as required by Law.

11.3 Property Insurance:

Add the following to Paragraph 11.3.1.1:

"The form of policy for this coverage shall be Completed Value."

Delete Paragraph 11.3.1.4 in its entirety and substitute the following:

11.3.1.4 The Contractor shall provide insurance coverage for portions of the Work stored off the site, in transit, and stored on the site but not incorporated into the Work as full replacement cost basis without voluntary deductible.

11.4 Performance Bond and Payment Bond:

Add the following to Paragraph 11.4.1:

11.4.1 Bonds shall be obtained from a surety satisfactory to the Owner, licensed to do business in the state where the project is located. The amount of each bond shall be included in the Contract Sum. Each bond shall be maintained throughout the duration of the Project and shall remain in effect for a period of not less than two (2) years following final completion of the work by the Contractor.

Add the following subparagraph to 11.4.1:

11.4.1.4 The Contractor shall deliver the required bonds to the Owner prior to beginning construction activity at the site, but no later than three (3) days after execution of the Contract, on A.I.A. Document A312, Performance Bond and Payment Bond.

L. Article 14 - Termination or Suspension of the Contract

14.1 Termination by the Contractor:

Add the following to 14.1.1:

14.1.1.5 In accordance with Section 103.1, General Municipal Law, if any person when called to testify before a Grand Jury concerning any transaction or contract with the State of New York or a political subdivision thereof, or a public authority, or a public department, agency, or official of any of the foregoing, refuses to sign a waiver of immunity against subsequent criminal prosecution or refuses to answer any relevant questions concerning such transaction or contract; then any such person, or any firm, partnership, or corporation of which he is a member, partner, director, or official shall be disqualified for a period of five (5) years after such refusal from submitted bids to, receiving awards, or entering into any contract with, any municipal corporation or department or agency or official thereof.

If such person refuses to sign a waiver of immunity

or to answer any relevant questions as aforesaid, then this Contract may be canceled or terminated by the Owner without the Owner incurring any penalty or damages by virtue of such cancellation or termination.

14.1.1.6 In accordance with Section 109, General Municipal Law, the Contractor shall not assign, transfer, convey, sublet, or otherwise dispose of the Contract for the Work herein specified, or his right, title, or interest therein, or his power to execute the Contract, to any other person or corporation without the previous consent in writing of the Board of Education.

If the Contractor, without previous written consent of the Board of Education, shall assign, transfer, convey, sublet, or otherwise dispose of the Contract for the Work specified herein, or his power to execute the Contract, to any other person or corporation, the Board of Education shall be relieved of and discharged from any and all liability and obligations growing out of the Contract to the Contractor, and to the persons or corporation to which the Contract shall have been assigned, transferred, conveyed, sublet, or otherwise disposed of, and the Contractor, and his assignees, transferees, or sublessees shall forfeit and lose all monies theretofore earned under the Contract, except so much as may be required to pay his employees.

The above provisions of this paragraph shall not hinder, prevent, or affect any assignment by the Contractor for the benefit of his creditors made pursuant to the laws of the State of New York.

Article 15 - Claims and Disputes

15.1 Claims:

Add to Paragraph 15.1.2:

Failure to do so shall be an irrevocable waiver of the Claim.

Modify Paragraph 15.1.5.1 as follows:

Delete the text after "notice" in line 2 and substitute the following text and sentence, "shall be given by the Contractor to the Architect within 7 days of its commencement. The failure to give such notice shall constitute an irrevocable waiver of the Claim.

Delete from the second sentence the following, "of cost and"

In the event of a continuing delay, only one claim is necessary.

Add the following Subparagraphs to 15.1.5.1:

15.1.5.1.1 An application for extension of time must set forth in detail the nature of each alleged cause of delay, the dates upon which such cause of delay began and ended, the number of days attributable to each of such causes, and the probable effect of such causes on the previously approved progress schedule.

15.1.5.1.2 Failure to strictly comply with these requirements may, at the discretion of the Owner, be deemed sufficient cause on the previously approved progress schedule.

Add the following Subparagraph to 15.1.5.2:

15.1.5.2.1 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.

Add the following paragraph to 15.1:

15.1.7 The Owner shall not be liable to the Contractor and/or Subcontractor for financial Claims or monetary damages of any nature caused by or arising out of delays. The sole remedy against the Owner for 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 to the extent, if any, expressly prohibited by law, the Contractor expressly agrees not to make any hereby waives any Claim for damages for delay, including, but not limited to, those resulting from increase labor or material costs; directions given or not given by the Owner, Architect, including scheduling and coordination of the Work; the Architect's preparation of drawings and specifications or review of shop drawings and requests for instruction(s); or, on account of any delay, obstruction or hinderance for any cause whatsoever by the Owner, Architect, or any other contractor on this Project, whether or not foreseeable or anticipated. The Contractor agrees that its sole right and remedy therefore shall be an extension of time if appropriate. IT IS EMPHASIZED THAT NO MONETARY RECOVERY MAY BE OBTAINED BY THE

CONTRACTOR FOR DELAY AGAINST THE OWNER, CONSTRUCTION MANAGER, OR ARCHITECT BASED ON ANY REASON AND THAT THE CONTRACTOR'S SOLE REMEDY, IF APPROPRIATE, IS ADDITIONAL TIME.

15.2 Initial Decision:

Add to end of 15.2.1:

Add the following text at the end of the third sentence of this Subparagraph:..."provided, with respect to Claims submitted more than one year after payment is due, the decision by the Architect shall not be a condition precedent to litigation, and the Claim not need be submitted to the Architect.

Add the following Paragraph 15.2.9:

"Within 10 days of a written request, the Contractor will make available to the Owner or its representative books, records, or other documents in its possession or to which it has access relating to a claim and shall require its Subcontractors, regardless of tier, and materialmen to do likewise."

Add the following new article in its entirety:

Article 16-Indemnification

16.1.1 The Contractor and its Subcontractors shall indemnify and hold harmless the Owner, Architect and the Construction Manager, and all their employees, agents or servants or any third parties from and against any and all claims, damages, losses, suits, obligations, fines, penalties, costs, charges and expenses, including but not limited to attorneys' fees, which may be imposed upon or incurred by or asserted against any of them by reason of any act or omission of such Contractor, or any of its Subcontractors, or any person or firm directly or indirectly employed by such Contractor, for the act(s) and/or omission(s) of any Contractor or Subcontractor in connection with the work of the Project.

16.1.2 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Construction Manager, the Architect, the Architect's consultants, and agents and employees 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 its work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction, of tangible

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Rev. 08.20.20

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property including loss of use resulting therefrom, but only to the extent caused in whole or in part by negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone 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. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this paragraph 16.1.2. The Contractor's indemnity obligations under this Paragraph 16.1.2 shall, but not by way of limitation, specifically include all claims and judgments which may be made against the Owner, the Construction Manager, the Architect, the Architect's consultants and agents and employees of any of them under any applicable statute, rule or regulation including the New York Statute, Occupational Safety and Hazardous Act, and the Federal Occupational Safety and Hazardous Act. In claims against any person or entity indemnified under this paragraph 16.1.2 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 this paragraph 16.1.2 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' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

16.1.3 The Contractor shall indemnify and hold harmless: (1) the Owner, its consultants, employees, officers and agents; (2) the Construction Manager; and (3) the Architect and its consultants, employees, officers and agents, against any actions, lawsuits or proceedings or claims of liens brought against each or any of them as a result of liens filed against the Contractor's project funds, including all the cost and expense of said liens, and including but not limited to attorneys' fees incurred by each or any of them.

16.1.4 The Contractor shall indemnify and hold harmless the Owner, the Construction Manager, and the Architect of and from any and all liability for violation of any laws and regulations applicable to the Contractor's work 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 to refuse to defend any such action, the Contractor shall be liable to the Owner for all costs in defending such claim or action and all costs of the Owner, including attorney's fees, in recovering such defense costs from

the Contractor.

- 16.1.5 The Contractor shall indemnify and hold harmless the Owner, the Construction Manager, and the Architect of and from any and all liability for claims made by third parties, including subcontractors, in connection with this Agreement 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 to 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 fees, in recovering such defense costs from the Contractor.

END OF SECTION



Kathy Hochul, Governor

Roberta Reardon, Commissioner

Briarcliff Manor UFSD

Greg O'Connor, Project Manager
187 Wolf Rd
Albany NY 12205

Schedule Year 2021 through 2022
Date Requested 09/17/2021
PRC# 2021009745

Location Middle-High-Todd Elem Schools
Project ID# 21-274a
Project Type Phase 1 Bond improvement for Middle/ High School and Todd Elementary School at Briarcliff Manor.
Includes Roof replacement, mechanical and electrical work and interior work at classroom and corridors.

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 2021 through June 2022. 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

General Provisions of Laws Covering Workers on Article 8 Public Work Contracts

Introduction

The Labor Law requires public work contractors and subcontractors to pay laborers, workers, or mechanics employed in the performance of a public work contract not less than the prevailing rate of wage and supplements (fringe benefits) in the locality where the work is performed.

Responsibilities of the Department of Jurisdiction

A Department of Jurisdiction (Contracting Agency) includes a state department, agency, board or commission; a county, city, town or village; a school district, board of education or board of cooperative educational services; a sewer, water, fire, improvement and other district corporation; a public benefit corporation; and a public authority awarding a public work contract.

The Department of Jurisdiction (Contracting Agency) awarding a public work contract MUST obtain a Prevailing Rate Schedule listing the hourly rates of wages and supplements due the workers to be employed on a public work project. This schedule may be obtained by completing and forwarding a "Request for wage and Supplement Information" form (PW 39) to the Bureau of Public Work. The Prevailing Rate Schedule MUST be included in the specifications for the contract to be awarded and is deemed part of the public work contract.

Upon the awarding of the contract, the law requires that the Department of Jurisdiction (Contracting Agency) furnish the following information to the Bureau: the name and address of the contractor, the date the contract was let and the approximate dollar value of the contract. To facilitate compliance with this provision of the Labor Law, a copy of the Department's "Notice of Contract Award" form (PW 16) is provided with the original Prevailing Rate Schedule.

The Department of Jurisdiction (Contracting Agency) is required to notify the Bureau of the completion or cancellation of any public work project. The Department's PW 200 form is provided for that purpose.

Both the PW 16 and PW 200 forms are available for completion [online](#).

Hours

No laborer, worker, or mechanic in the employ of a contractor or subcontractor engaged in the performance of any public work project shall be permitted to work more than eight hours in any day or more than five days in any week, except in cases of extraordinary emergency. The contractor and the Department of Jurisdiction (Contracting Agency) may apply to the Bureau of Public Work for a dispensation permitting workers to work additional hours or days per week on a particular public work project.

There are very few exceptions to this rule. Complete information regarding these exceptions is available on the ["Request for a dispensation to work overtime" form \(PW30\)](#) and ["4 Day / 10 Hour Work Schedule" form \(PW 30.1\)](#).

Wages and Supplements

The wages and supplements to be paid and/or provided to laborers, workers, and mechanics employed on a public work project shall be not less than those listed in the current Prevailing Rate Schedule for the locality where the work is performed. If a prime contractor on a public work project has not been provided with a Prevailing Rate Schedule, the contractor must notify the Department of Jurisdiction (Contracting Agency) who in turn must request an original Prevailing Rate Schedule form the Bureau of Public Work. Requests may be submitted by: mail to NYSDOL, Bureau of Public Work, State Office Bldg. Campus, Bldg. 12, Rm. 130, Albany, NY 12240; Fax to Bureau of Public Work (518) 485-1870; or electronically at the NYSDOL website www.labor.ny.gov.

Upon receiving the original schedule, the Department of Jurisdiction (Contracting Agency) is REQUIRED to provide complete copies to all prime contractors who in turn MUST, by law, provide copies of all applicable county schedules to each subcontractor and obtain from each subcontractor, an affidavit certifying such schedules were received. If the original schedule expired, the contractor may obtain a copy of the new annual determination from the NYSDOL website www.labor.ny.gov.

The Commissioner of Labor makes an annual determination of the prevailing rates. This determination is in effect from July 1st through June 30th of the following year. The annual determination is available on the NYSDOL website www.labor.ny.gov.

Payrolls and Payroll Records

Every contractor and subcontractor MUST keep original payrolls or transcripts subscribed and affirmed as true under penalty of perjury. As per Article 6 of the Labor law, contractors and subcontractors are required to establish, maintain, and preserve for not less than six (6) years, contemporaneous, true, and accurate payroll records. At a minimum, payrolls must show the following information for each person employed on a public work project: Name, Address, Last 4 Digits of Social Security Number, Classification(s) in which the worker was employed, Hourly wage rate(s) paid, Supplements paid

or provided, and Daily and weekly number of hours worked in each classification.

The filing of payrolls to the Department of Jurisdiction is a condition of payment. Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury. The Department of Jurisdiction (Contracting Agency) shall collect, review for facial validity, and maintain such payrolls.

In addition, the Commissioner of Labor may require contractors to furnish, with ten (10) days of a request, payroll records sworn to as their validity and accuracy for public work and private work. Payroll records include, but are not limited to time cards, work description sheets, proof that supplements were provided, cancelled payroll checks and payrolls. Failure to provide the requested information within the allotted ten (10) days will result in the withholding of up to 25% of the contract, not to exceed \$100,000.00. If the contractor or subcontractor does not maintain a place of business in New York State and the amount of the contract exceeds \$25,000.00, payroll records and certifications must be kept on the project worksite.

The prime contractor is responsible for any underpayments of prevailing wages or supplements by any subcontractor.

All contractors or their subcontractors shall provide to their subcontractors a copy of the Prevailing Rate Schedule specified in the public work contract as well as any subsequently issued schedules. A failure to provide these schedules by a contractor or subcontractor is a violation of Article 8, Section 220-a of the Labor Law.

All subcontractors engaged by a public work project contractor or its subcontractor, upon receipt of the original schedule and any subsequently issued schedules, shall provide to such contractor a verified statement attesting that the subcontractor has received the Prevailing Rate Schedule and will pay or provide the applicable rates of wages and supplements specified therein. (See NYS Labor Laws, Article 8 . Section 220-a).

Determination of Prevailing Wage and Supplement Rate Updates Applicable to All Counties

The wages and supplements contained in the annual determination become effective July 1st whether or not the new determination has been received by a given contractor. Care should be taken to review the rates for obvious errors. Any corrections should be brought to the Department's attention immediately. It is the responsibility of the public work contractor to use the proper rates. If there is a question on the proper classification to be used, please call the district office located nearest the project. Any errors in the annual determination will be corrected and posted to the NYSDOL website on the first business day of each month. Contractors are responsible for paying these updated rates as well, retroactive to July 1st.

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. To the extent possible, the Department posts rates in its possession that cover periods of time beyond the July 1st to June 30th time frame covered by a particular annual determination. Rates that extend beyond that instant time period are informational ONLY and may be updated in future annual determinations that actually cover the then appropriate July 1st to June 30th time period.

Withholding of Payments

When a complaint is filed with the Commissioner of Labor alleging the failure of a contractor or subcontractor to pay or provide the prevailing wages or supplements, or when the Commissioner of Labor believes that unpaid wages or supplements may be due, payments on the public work contract shall be withheld from the prime contractor in a sufficient amount to satisfy the alleged unpaid wages and supplements, including interest and civil penalty, pending a final determination.

When the Bureau of Public Work finds that a contractor or subcontractor on a public work project failed to pay or provide the requisite prevailing wages or supplements, the Bureau is authorized by Sections 220-b and 235.2 of the Labor Law to so notify the financial officer of the Department of Jurisdiction (Contracting Agency) that awarded the public work contract. Such officer MUST then withhold or cause to be withheld from any payment due the prime contractor on account of such contract the amount indicated by the Bureau as sufficient to satisfy the unpaid wages and supplements, including interest and any civil penalty that may be assessed by the Commissioner of Labor. The withholding continues until there is a final determination of the underpayment by the Commissioner of Labor or by the court in the event a legal proceeding is instituted for review of the determination of the Commissioner of Labor.

The Department of Jurisdiction (Contracting Agency) shall comply with this order of the Commissioner of Labor or of the court with respect to the release of the funds so withheld.

Summary of Notice Posting Requirements

The current Prevailing Rate Schedule must be posted in a prominent and accessible place on the site of the public work project. The prevailing wage schedule must be encased in, or constructed of, materials capable of withstanding adverse weather conditions and be titled "PREVAILING RATE OF WAGES" in letters no smaller than two (2) inches by two (2) inches.

The "Public Work Project" notice must be posted at the beginning of the performance of every public work contract, on each job site.

Every employer providing workers' compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers' Compensation Board in a conspicuous place on the jobsite.

Every employer subject to the NYS Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers, notices furnished by the State Division of Human Rights.

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the NYS Department of Labor.

Apprentices

Employees cannot be paid apprentice rates unless they are individually registered in a program registered with the NYS Commissioner of Labor. The allowable ratio of apprentices to journeymen in any craft classification can be no greater than the statewide building trade ratios promulgated by the Department of Labor and included with the Prevailing Rate Schedule. An employee listed on a payroll as an apprentice who is not registered as above or is performing work outside the classification of work for which the apprentice is indentured, must be paid the prevailing journeyman's wage rate for the classification of work the employee is actually performing.

NYSDOL Labor Law, Article 8, Section 220-3, require that only apprentices individually registered with the NYS Department of Labor may be paid apprenticeship rates on a public work project. No other Federal or State Agency of office registers apprentices in New York State.

Persons wishing to verify the apprentice registration of any person must do so in writing by mail, to the NYSDOL Office of Employability Development / Apprenticeship Training, State Office Bldg. Campus, Bldg. 12, Albany, NY 12240 or by Fax to NYSDOL Apprenticeship Training (518) 457-7154. All requests for verification must include the name and social security number of the person for whom the information is requested.

The only conclusive proof of individual apprentice registration is written verification from the NYSDOL Apprenticeship Training Albany Central office. Neither Federal nor State Apprenticeship Training offices outside of Albany can provide conclusive registration information.

It should be noted that the existence of a registered apprenticeship program is not conclusive proof that any person is registered in that program. Furthermore, the existence or possession of wallet cards, identification cards, or copies of state forms is not conclusive proof of the registration of any person as an apprentice.

Interest and Penalties

In the event that an underpayment of wages and/or supplements is found:

- Interest shall be assessed at the rate then in effect as prescribed by the Superintendent of Banks pursuant to section 14-a of the Banking Law, per annum from the date of underpayment to the date restitution is made.
- A Civil Penalty may also be assessed, not to exceed 25% of the total of wages, supplements, and interest due.

Debarment

Any contractor or subcontractor and/or its successor shall be ineligible to submit a bid on or be awarded any public work contract or subcontract with any state, municipal corporation or public body for a period of five (5) years when:

- Two (2) willful determinations have been rendered against that contractor or subcontractor and/or its successor within any consecutive six (6) year period.
- There is any willful determination that involves the falsification of payroll records or the kickback of wages or supplements.

Criminal Sanctions

Willful violations of the Prevailing Wage Law (Article 8 of the Labor Law) may be a felony punishable by fine or imprisonment of up to 15 years, or both.

Discrimination

No employee or applicant for employment may be discriminated against on account of age, race, creed, color, national origin, sex, disability or marital status.

No contractor, subcontractor nor any person acting on its behalf, shall by reason of race, creed, color, disability, sex 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 (NYS Labor Law, Article 8, Section 220-e(a)).

No contractor, subcontractor, nor any person acting on its behalf, shall in any manner, discriminate against or intimidate any employee on account of race, creed, color, disability, sex, or national origin (NYS Labor Law, Article 8, Section 220-e(b)).

The Human Rights Law also prohibits discrimination in employment because of age, marital status, or religion.

There may be deducted from the amount payable to the contractor under the contract a penalty of \$50.00 for each calendar day during which such person was discriminated against or intimidated in violation of the provision of the contract (NYS Labor Law, Article 8, Section 220-e(c)).

The contract may be cancelled or terminated by the State or municipality. All monies due or to become due thereunder may be forfeited for a second or any subsequent violation of the terms or conditions of the anti-discrimination sections of the contract (NYS Labor Law, Article 8, Section 220-e(d)).

Every employer subject to the New York State Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers notices furnished by the State Division of Human Rights.

Workers' Compensation

In accordance with Section 142 of the State Finance Law, the contractor shall maintain coverage during the life of the contract for the benefit of such employees as required by the provisions of the New York State Workers' Compensation Law.

A contractor who is awarded a public work contract must provide proof of workers' compensation coverage prior to being allowed to begin work.

The insurance policy must be issued by a company authorized to provide workers' compensation coverage in New York State. Proof of coverage must be on form C-105.2 (Certificate of Workers' Compensation Insurance) and must name this agency as a certificate holder.

If New York State coverage is added to an existing out-of-state policy, it can only be added to a policy from a company authorized to write workers' compensation coverage in this state. The coverage must be listed under item 3A of the information page.

The contractor must maintain proof that subcontractors doing work covered under this contract secured and maintained a workers' compensation policy for all employees working in New York State.

Every employer providing worker's compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers' Compensation Board in a conspicuous place on the jobsite.

Unemployment Insurance

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the New York State Department of Labor.



Kathy Hochul, Governor

Roberta Reardon, Commissioner

Briarcliff Manor UFSD

Greg O'Connor, Project Manager
187 Wolf Rd
Albany NY 12205

Schedule Year 2021 through 2022
Date Requested 09/17/2021
PRC# 2021009745

Location Middle-High-Todd Elem Schools
Project ID# 21-274a
Project Type Phase 1 Bond improvement for Middle/ High School and Todd Elementary School at Briarcliff Manor.
Includes Roof replacement, mechanical and electrical work and interior work at classroom and corridors.

Notice of Contract Award

New York State Labor Law, Article 8, Section 220.3a requires that certain information regarding the awarding of public work contracts, be furnished to the Commissioner of Labor. One "Notice of Contract Award" (PW 16, which may be photocopied), **MUST** be completed for **EACH** prime contractor on the above referenced project.

Upon notifying the successful bidder(s) of this contract, 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.

Contractor Information

All information must be supplied

Federal Employer Identification Number: _____		
Name: _____		
Address: _____ _____		
City: _____	State: _____	Zip: _____
Amount of Contract: \$ _____	Contract Type:	
Approximate Starting Date: ____/____/____	<input type="checkbox"/> (01) General Construction	
Approximate Completion Date: ____/____/____	<input type="checkbox"/> (02) Heating/Ventilation	
	<input type="checkbox"/> (03) Electrical	
	<input type="checkbox"/> (04) Plumbing	
	<input type="checkbox"/> (05) Other : _____	

Phone: (518) 457-5589 Fax: (518) 485-1870
W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12240

Social Security Numbers on Certified Payrolls:

The Department of Labor is cognizant of the concerns of the potential for misuse or inadvertent disclosure of social security numbers. Identity theft is a growing problem and we are sympathetic to contractors' concern regarding inclusion of this information on payrolls if another identifier will suffice.

For these reasons, the substitution of the use of the last four digits of the social security number on certified payrolls submitted to contracting agencies on public work projects is now acceptable to the Department of Labor. This change does not affect the Department's ability to request and receive the entire social security number from employers during its public work/ prevailing wage investigations.

Construction Industry Fair Play Act: Required Posting for Labor Law Article 25-B § 861-d

Construction industry employers must post the "Construction Industry Fair Play Act" notice in a prominent and accessible place on the job site. Failure to post the notice can result in penalties of up to \$1,500 for a first offense and up to \$5,000 for a second offense. The posting is included as part of this wage schedule. Additional copies may be obtained from the NYS DOL website, www.labor.ny.gov. <https://labor.ny.gov/formsdocs/ui/IA999.pdf>

If you have any questions concerning the Fair Play Act, please call the State Labor Department toll-free at 1-866-435-1499 or email us at: dol.misclassified@labor.ny.gov .

Worker Notification: (Labor Law §220, paragraph a of subdivision 3-a)

Effective June 23, 2020

This provision is an addition to the existing wage rate law, Labor Law §220, paragraph a of subdivision 3-a. It requires contractors and subcontractors to provide written notice to all laborers, workers or mechanics of the *prevailing wage and supplement rate* for their particular job classification *on each pay stub**. It also requires contractors and subcontractors to *post a notice* at the beginning of the performance of every public work contract *on each job site* that includes the telephone number and address for the Department of Labor and a statement informing laborers, workers or mechanics of their right to contact the Department of Labor if he/she is not receiving the proper prevailing rate of wages and/or supplements for his/her job classification. The required notification will be provided with each wage schedule, may be downloaded from our website www.labor.ny.gov or be made available upon request by contacting the Bureau of Public Work at 518-457-5589. *In the event the required information will not fit on the pay stub, an accompanying sheet or attachment of the information will suffice.

(12.20)

**To all State Departments, Agency Heads and Public Benefit Corporations
IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND**

Budget Policy & Reporting Manual

B-610

Public Work Enforcement Fund

effective date December 7, 2005

1. Purpose and Scope:

This Item describes the Public Work Enforcement Fund (the Fund, PWEF) and its relevance to State agencies and public benefit corporations engaged in construction or reconstruction contracts, maintenance and repair, and announces the recently-enacted increase to the percentage of the dollar value of such contracts that must be deposited into the Fund. This item also describes the roles of the following entities with respect to the Fund:

- New York State Department of Labor (DOL),
- The Office of the State of Comptroller (OSC), and
- State agencies and public benefit corporations.

2. Background and Statutory References:

DOL uses the Fund to enforce the State's Labor Law as it relates to contracts for construction or reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law. State agencies and public benefit corporations participating in such contracts are required to make payments to the Fund.

Chapter 511 of the Laws of 1995 (as amended by Chapter 513 of the Laws of 1997, Chapter 655 of the Laws of 1999, Chapter 376 of the Laws of 2003 and Chapter 407 of the Laws of 2005) established the Fund.

3. Procedures and Agency Responsibilities:

The Fund is supported by transfers and deposits based on the value of contracts for construction and reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law, into which all State agencies and public benefit corporations enter.

Chapter 407 of the Laws of 2005 increased the amount required to be provided to this fund to .10 of one-percent of the total cost of each such contract, to be calculated at the time agencies or public benefit corporations enter into a new contract or if a contract is amended. The provisions of this bill became effective August 2, 2005.

To all State Departments, Agency Heads and Public Benefit Corporations
IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND

OSC will report to DOL on all construction-related ("D") contracts approved during the month, including contract amendments, and then DOL will bill agencies the appropriate assessment monthly. An agency may then make a determination if any of the billed contracts are exempt and so note on the bill submitted back to DOL. For any instance where an agency is unsure if a contract is or is not exempt, they can call the Bureau of Public Work at the number noted below for a determination. Payment by check or journal voucher is due to DOL within thirty days from the date of the billing. DOL will verify the amounts and forward them to OSC for processing.

For those contracts which are not approved or administered by the Comptroller, monthly reports and payments for deposit into the Public Work Enforcement Fund must be provided to the Administrative Finance Bureau at the DOL within 30 days of the end of each month or on a payment schedule mutually agreed upon with DOL.

Reports should contain the following information:

- Name and billing address of State agency or public benefit corporation;
- State agency or public benefit corporation contact and phone number;
- Name and address of contractor receiving the award;
- Contract number and effective dates;
- Contract amount and PWEF assessment charge (if contract amount has been amended, reflect increase or decrease to original contract and the adjustment in the PWEF charge); and
- Brief description of the work to be performed under each contract.

Checks and Journal Vouchers, payable to the "New York State Department of Labor" should be sent to:

Department of Labor
Administrative Finance Bureau-PWEF Unit
Building 12, Room 464
State Office Campus
Albany, NY 12240

Any questions regarding billing should be directed to NYSDOL's Administrative Finance Bureau-PWEF Unit at (518) 457-3624 and any questions regarding Public Work Contracts should be directed to the Bureau of Public Work at (518) 457-5589.



Required Notice under Article 25-B of the Labor Law

Attention All Employees, Contractors and Subcontractors: You are Covered by the Construction Industry Fair Play Act

The law says that you are an employee unless:

- You are free from direction and control in performing your job, **and**
- You perform work that is not part of the usual work done by the business that hired you, **and**
- You have an independently established business.

Your employer cannot consider you to be an independent contractor unless all three of these facts apply to your work.

It is against the law for an employer to misclassify employees as independent contractors or pay employees off the books.

Employee Rights: If you are an employee, you are entitled to state and federal worker protections. These include:

- Unemployment Insurance benefits, if you are unemployed through no fault of your own, able to work, and otherwise qualified,
- Workers' compensation benefits for on-the-job injuries,
- Payment for wages earned, minimum wage, and overtime (under certain conditions),
- Prevailing wages on public work projects,
- The provisions of the National Labor Relations Act, and
- A safe work environment.

It is a violation of this law for employers to retaliate against anyone who asserts their rights under the law. Retaliation subjects an employer to civil penalties, a private lawsuit or both.

Independent Contractors: If you are an independent contractor, **you must pay all taxes and Unemployment Insurance contributions required by New York State and Federal Law.**

Penalties for paying workers off the books or improperly treating employees as independent contractors:

- **Civil Penalty**
 - First offense: Up to \$2,500 per employee
 - Subsequent offense(s): Up to \$5,000 per employee
- **Criminal Penalty**
 - First offense: Misdemeanor - up to 30 days in jail, up to a \$25,000 fine and debarment from performing public work for up to one year.
 - Subsequent offense(s): Misdemeanor - up to 60 days in jail or up to a \$50,000 fine and debarment from performing public work for up to 5 years.

If you have questions about your employment status or believe that your employer may have violated your rights and you want to file a complaint, call the Department of Labor at (866) 435-1499 or send an email to dol.misclassified@labor.ny.gov. All complaints of fraud and violations are taken seriously. You can remain anonymous.

Employer Name:

IA 999 (09/16)

Attention Employees

THIS IS A: **PUBLIC WORK PROJECT**

If you are employed on this project as a **worker, laborer, or mechanic** you are entitled to receive the **prevailing wage and supplements rate** for the classification at which you are working.

Chapter 629 of
the Labor Laws
of 2007:

**These wages are set by law and must be posted
at the work site. They can also be found at:**
www.labor.ny.gov

If you feel that you have not received proper wages or benefits,
please call our nearest office.*

Albany	(518) 457-2744	Patchogue	(631) 687-4882
Binghamton	(607) 721-8005	Rochester	(585) 258-4505
Buffalo	(716) 847-7159	Syracuse	(315) 428-4056
Garden City	(516) 228-3915	Utica	(315) 793-2314
New York City	(212) 932-2419	White Plains	(914) 997-9507
Newburgh	(845) 568-5156		

* For New York City government agency construction projects, please
contact the Office of the NYC Comptroller at (212) 669-4443, or
www.comptroller.nyc.gov – click on Bureau of Labor Law.

Contractor Name: _____

Project Location: _____

Requirements for OSHA 10 Compliance

Article 8 §220-h requires that when the advertised specifications, for every contract for public work, is \$250,000.00 or more the contract must contain a provision requiring that every worker employed in the performance of a public work contract shall be certified as having completed an OSHA 10 safety training course. The clear intent of this provision is to require that all employees of public work contractors, required to be paid prevailing rates, receive such training "prior to the performing any work on the project."

The Bureau will enforce the statute as follows:

All contractors and sub contractors must attach a copy of proof of completion of the OSHA 10 course to the first certified payroll submitted to the contracting agency and on each succeeding payroll where any new or additional employee is first listed.

Proof of completion may include but is not limited to:

- Copies of bona fide course completion card (*Note: Completion cards do not have an expiration date.*)
- Training roster, attendance record or other documentation from the certified trainer pending the issuance of the card.
- Other valid proof

**A certification by the employer attesting that all employees have completed such a course is not sufficient proof that the course has been completed.

Any questions regarding this statute may be directed to the New York State Department of Labor, Bureau of Public Work at 518-457-5589.

WICKS

Public work projects are subject to the Wicks Law requiring separate specifications and bidding for the plumbing, heating and electrical work, when the total project's threshold is \$3 million in Bronx, Kings, New York, Queens and, Richmond counties; \$1.5 million in Nassau, Suffolk and Westchester counties; and \$500,000 in all other counties.

For projects below the monetary threshold, bidders must submit a sealed list naming each subcontractor for the plumbing, HVAC and electrical and the amount to be paid to each. The list may not be changed unless the public owner finds a legitimate construction need, including a change in specifications or costs or the use of a Project Labor Agreement (PLA), and must be open to public inspection.

Allows the state and local agencies and authorities to waive the Wicks Law and use a PLA if it will provide the best work at the lowest possible price. If a PLA is used, all contractors shall participate in apprentice training programs in the trades of work it employs that have been approved by the Department of Labor (DOL) for not less than three years. They shall also have at least one graduate in the last three years and use affirmative efforts to retain minority apprentices. PLA's would be exempt from Wicks, but deemed to be public work subject to prevailing wage enforcement.

The Commissioner of Labor shall have the power to enforce separate specification requirements on projects, and may issue stop-bid orders against public owners for non-compliance.

Other new monetary thresholds, and similar sealed bidding for non-Wicks projects, would apply to certain public authorities including municipal housing authorities, NYC Construction Fund, Yonkers Educational Construction Fund, NYC Municipal Water Finance Authority, Buffalo Municipal Water Finance Authority, Westchester County Health Care Association, Nassau County Health Care Corp., Clifton-Fine Health Care Corp., Erie County Medical Center Corp., NYC Solid Waste Management Facilities, and the Dormitory Authority.

Contractors must pay subcontractors within a 7 days period.

(07.19)

Introduction to the Prevailing Rate Schedule

Information About Prevailing Rate Schedule

This information is provided to assist you in the interpretation of particular requirements for each classification of worker contained in the attached Schedule of Prevailing Rates.

Classification

It is the duty of the Commissioner of Labor to make the proper classification of workers taking into account whether the work is heavy and highway, building, sewer and water, tunnel work, or residential, and to make a determination of wages and supplements to be paid or provided. It is the responsibility of the public work contractor to use the proper rate. If there is a question on the proper classification to be used, please call the district office located nearest the project. District office locations and phone numbers are listed below.

Prevailing Wage Schedules are issued separately for "General Construction Projects" and "Residential Construction Projects" on a county-by-county basis.

General Construction Rates apply to projects such as: Buildings, Heavy & Highway, and Tunnel and Water & Sewer rates.

Residential Construction Rates generally apply to construction, reconstruction, repair, alteration, or demolition of one family, two family, row housing, or rental type units intended for residential use.

Some rates listed in the Residential Construction Rate Schedule have a very limited applicability listed along with the rate. Rates for occupations or locations not shown on the residential schedule must be obtained from the General Construction Rate Schedule. Please contact the local Bureau of Public Work office before using Residential Rate Schedules, to ensure that the project meets the required criteria.

Payrolls and Payroll Records

Contractors and subcontractors are required to establish, maintain, and preserve for not less than six (6) years, contemporaneous, true, and accurate payroll records.

Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury.

Paid Holidays

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

Overtime

At a minimum, all work performed on a public work project in excess of eight hours in any one day or more than five days in any workweek is overtime. However, the specific overtime requirements for each trade or occupation on a public work project may differ. Specific overtime requirements for each trade or occupation are contained in the prevailing rate schedules.

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays.

The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Supplemental Benefits

Particular attention should be given to the supplemental benefit requirements. Although in most cases the payment or provision of supplements is straight time for all hours worked, some classifications require the payment or provision of supplements, or a portion of the supplements, to be paid or provided at a premium rate for premium hours worked. Supplements may also be required to be paid or provided on paid holidays, regardless of whether the day is worked. The Overtime Codes and Notes listed on the particular wage classification will indicate these conditions as required.

Effective Dates

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. The rate listed is valid until the next effective rate change or until the new annual determination which takes effect on July 1 of each year. All contractors and subcontractors are required to pay the current prevailing rates of wages and supplements. If you have any questions please contact the Bureau of Public Work or visit the New York State Department of Labor website (www.labor.ny.gov) for current wage rate information.

Apprentice Training Ratios

The following are the allowable ratios of registered Apprentices to Journey-workers.

For example, the ratio 1:1,1:3 indicates the allowable initial ratio is one Apprentice to one Journeyworker. The Journeyworker must be in place on the project before an Apprentice is allowed. Then three additional Journeyworkers are needed before a second Apprentice is allowed. The last ratio repeats indefinitely. Therefore, three more Journeyworkers must be present before a third Apprentice can be hired, and so on.

Please call Apprentice Training Central Office at (518) 457-6820 if you have any questions.

Title (Trade)	Ratio
Boilermaker (Construction)	1:1,1:4
Boilermaker (Shop)	1:1,1:3
Carpenter (Bldg.,H&H, Pile Driver/Dockbuilder)	1:1,1:4
Carpenter (Residential)	1:1,1:3
Electrical (Outside) Lineman	1:1,1:2
Electrician (Inside)	1:1,1:3
Elevator/Escalator Construction & Modernizer	1:1,1:2
Glazier	1:1,1:3
Insulation & Asbestos Worker	1:1,1:3
Iron Worker	1:1,1:4
Laborer	1:1,1:3
Mason	1:1,1:4
Millwright	1:1,1:4
Op Engineer	1:1,1:5
Painter	1:1,1:3
Plumber & Steamfitter	1:1,1:3
Roofer	1:1,1:2
Sheet Metal Worker	1:1,1:3
Sprinkler Fitter	1:1,1:2

If you have any questions concerning the attached schedule or would like additional information, please contact the nearest BUREAU of PUBLIC WORK District Office or write to:

New York State Department of Labor
 Bureau of Public Work
 State Office Campus, Bldg. 12
 Albany, NY 12240

District Office Locations:	Telephone #	FAX #
Bureau of Public Work - Albany	518-457-2744	518-485-0240
Bureau of Public Work - Binghamton	607-721-8005	607-721-8004
Bureau of Public Work - Buffalo	716-847-7159	716-847-7650
Bureau of Public Work - Garden City	516-228-3915	516-794-3518
Bureau of Public Work - Newburgh	845-568-5287	845-568-5332
Bureau of Public Work - New York City	212-932-2419	212-775-3579
Bureau of Public Work - Patchogue	631-687-4882	631-687-4902
Bureau of Public Work - Rochester	585-258-4505	585-258-4708
Bureau of Public Work - Syracuse	315-428-4056	315-428-4671
Bureau of Public Work - Utica	315-793-2314	315-793-2514
Bureau of Public Work - White Plains	914-997-9507	914-997-9523
Bureau of Public Work - Central Office	518-457-5589	518-485-1870

Westchester County General Construction

Boilermaker

09/01/2021

JOB DESCRIPTION Boilermaker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

WAGES

Per Hour: 07/01/2021

Boilermaker	\$ 63.38
Repairs & Renovations	63.38

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2021

Boilermaker	32% of hourly
Repair \$ Renovations	Wage Paid
	+ \$ 25.38

NOTE: "Hourly Wage Paid" shall include any and all premium(s) pay.

Repairs & Renovation Includes replacement of parts and repairs & renovation of existing unit.

OVERTIME PAY

See (D, O) on OVERTIME PAGE

Repairs & Renovation see (B,E,Q)

HOLIDAY

Paid: See (8, 16, 23, 24) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 12, 15, 16, 22, 23, 24, 25) on HOLIDAY PAGE

NOTE: *Employee must work in pay week to receive Holiday Pay.

**Employee gets 4 times the hourly wage rate for working Labor Day.

REGISTERED APPRENTICES

Wage per hour:

(1/2) Year Terms at the following percentage of Boilermaker's Wage

1st	2nd	3rd	4th	5th	6th	7th
65%	70%	75%	80%	85%	90%	95%

Supplemental Benefits Per Hour:

	07/01/2021
Apprentice(s)	32% of Hourly
	Wage Paid Plus
	Amount Below

1st Term	\$ 19.41
2nd Term	20.26
3rd Term	21.11
4th Term	21.96
5th Term	22.82
6th Term	23.68
7th Term	24.52

NOTE: "Hourly Wage Paid" shall include any and all premium(s)

4-5

Carpenter

09/01/2021

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per hour: 07/01/2021

Piledriver	\$ 56.93
Dockbuilder	\$ 56.93

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker \$ 53.33

OVERTIME PAY

See (B, E2, O) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE.

Paid: for 1st & 2nd yr.

Apprentices See (5,6,11,13,25)

Overtime: See (5,6,11,13,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wages per hour

(1)year terms:

1st	2nd	3rd	4th
\$23.37	\$28.97	\$37.35	\$45.74

Supplemental benefits per hour:

All Terms: \$ 35.33

8-1556 Db

Carpenter

09/01/2021

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per hour: 07/01/2021

Carpet/Resilient

Floor Coverer \$ 54.75

INCLUDES HANDLING & INSTALLATION OF ARTIFICIAL TURF AND SIMILAR TURF INDOORS/OUTDOORS.

SUPPLEMENTAL BENEFITS

Per hour:

\$ 46.97

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (18, 19) on HOLIDAY PAGE.

Paid for 1st & 2nd yr.

Apprentices See (5,6,11,13,16,18,19,25)

Overtime: See (5,6,11,13,16,18,19,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wage per hour - (1) year terms:

1st	2nd	3rd	4th
\$ 24.55	\$ 27.55	\$ 31.80	\$ 39.68

Supplemental benefits per hour:

1st	2nd	3rd	4th
\$ 16.19	\$ 17.69	\$ 21.29	\$ 23.29

8-2287

Carpenter

09/01/2021

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per Hour: 07/01/2021

Marine Construction:

Marine Diver	\$ 71.80
Marine Tender	51.34

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker \$ 53.33

OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (18, 19) on HOLIDAY PAGE

Overtime: See (5, 6, 10, 11, 13, 16, 18, 19) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One (1) year terms.

1st year	\$ 23.37
2nd year	28.97
3rd year	37.35
4th year	45.74

Supplemental Benefits

Per Hour:

All terms \$ 35.33

8-1456MC

Carpenter

09/01/2021

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per hour: 07/01/2021

Building	
Millwright	\$ 57.00

SUPPLEMENTAL BENEFITS

Per hour:

Millwright \$ 54.60

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (18,19) on HOLIDAY PAGE.

Overtime See (5,6,8,11,13,18,19,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wages per hour:

One (1) year terms:

1st.	2nd.	3rd.	4th.
\$30.74	\$36.19	\$41.64	\$52.54

Supplemental benefits per hour:

One (1) year terms:

1st.	2nd.	3rd.	4th.
------	------	------	------

\$35.03 \$38.73 \$43.08 \$49.84

8-740.1

Carpenter

09/01/2021

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per Hour:

07/01/2021

Timberman

\$ 52.05

SUPPLEMENTAL BENEFITS

Per Hour:

07/01/2021

\$ 52.78

OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE.

Paid: for 1st & 2nd yr.

Apprentices See (5,6,11,13,25)

Overtime: See (5,6,11,13,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wages per hour:

One (1) year terms:

1st	2nd	3rd	4th
\$21.42	\$26.53	\$34.18	\$41.84

Supplemental benefits per hour:

All terms \$ 35.06

8-1556 Tm

Carpenter

09/01/2021

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Westchester

PARTIAL COUNTIES

Orange: South of but including the following, Waterloo Mills, Slate Hill, New Hampton, Goshen, Blooming Grove, Mountainville, east to the Hudson River.

Putnam: South of but including the following, Cold Spring, TompkinsCorner, Mahopac, Croton Falls, east to Connecticut border.

Suffolk: West of Port Jefferson and Patchogue Road to Route 112 to the Atlantic Ocean.

WAGES

Per hour:

07/01/2021

10/18/2021

Core Drilling:

Driller

\$ 41.74

\$ 42.27

Driller Helper

32.92

33.47

Note: Hazardous Waste Pay Differential:

For Level C, an additional 10% above wage rate per hour

For Level B, an additional 10% above wage rate per hour

For Level A, an additional 10% above wage rate per hour

Note: When required to work on water: an additional \$ 0.50 per hour.

SUPPLEMENTAL BENEFITS

Per hour:

Driller and Helper

\$ 29.40

\$ 30.60

OVERTIME PAY

OVERTIME: See (B,E,K*,P,R**) on OVERTIME PAGE.

HOLIDAY

Paid: See (5,6) on HOLIDAY PAGE.

Overtime: * See (5,6) on HOLIDAY PAGE.

** See (8,10,11,13) on HOLIDAY PAGE.

8-1536-CoreDriller

Carpenter - Building / Heavy&Highway

09/01/2021

JOB DESCRIPTION Carpenter - Building / Heavy&Highway

DISTRICT 11

ENTIRE COUNTIES

Putnam, Rockland, Westchester

WAGES

WAGES:(per hour)

07/01/2021

BUILDING/HEAVY & HIGHWAY/TUNNEL:

Carpenter

Base Wage

\$ 37.69

+ \$7.63*

*For all hours paid straight or premium.

SHIFT DIFFERENTIAL: When it is mandated by a Government Agency irregular or off shift can be worked. The Carpenter shall receive an additional fifteen percent (15%) of wage plus applicable benefits.

NOTE: Carpenters employed in the removal or abatement of asbestos or any toxic or hazardous material or required to work near asbestos or any toxic or hazardous material and required to wear protective equipment shall receive two (2) hours extra pay per day, plus applicable supplemental benefits.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker

\$ 31.91

OVERTIME PAY

BUILDING:

See (B, E, Q) on OVERTIME PAGE.

HEAVY&HIGHWAY/TUNNEL:

See (B, E, P, *R, **T, X) on OVERTIME PAGE.

*R applies to Heavy&Highway/Tunnel Overtime Holiday Code 25 with benefits at straight time rate.

**T applies to Heavy&Highway/Tunnel Overtime Holiday Codes 5 & 6 with benefits at straight time rate.

HOLIDAY

BUILDING:

Paid: See (1) on HOLIDAY PAGE.

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE.

Holidays that fall on Sunday will be observed Monday.

HEAVY&HIGHWAY/TUNNEL:

Paid: See (5, 6, 25) on HOLIDAY PAGE including benefits.

Overtime: See (5, 6, 25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

1 year terms at the following wage rates:

Indentured before July 1 2016

1st	2nd	3rd	4th
\$ 18.85	\$ 22.61	\$ 26.38	\$ 30.15
+3.57*	+3.57*	+3.57*	+3.57*

Indentured after July 1 2016

1st	2nd	3rd	4th	5th
\$ 18.85	\$ 22.61	\$ 24.50	\$ 26.38	\$ 30.15
+3.57*	+3.57*	+3.57*	+3.57*	+3.57*

*For all hours paid straight or premium

SUPPLEMENTAL BENEFITS per hour:

All terms \$ 16.28

11-279.1B/HH

Electrician	09/01/2021
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JOB DESCRIPTION Electrician

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond, Westchester

WAGES

Per hour: 07/01/2021

Service Technician \$ 34.40

Service and Maintenance on Alarm and Security Systems.

Maintenance, repair and /or replacement of defective (or damaged) equipment on, but not limited to, Burglar - Fire - Security - CCTV - Card Access - Life Safety Systems and associated devices. (Whether by service contract of T&M by customer request.)

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker: \$ 19.32

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 11, 15, 16, 17, 25, 26) on HOLIDAY PAGE

Overtime: See (5, 6, 11, 15, 16, 17, 25, 26) on HOLIDAY PAGE

9-3H

Electrician	09/01/2021
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JOB DESCRIPTION Electrician

DISTRICT 8

ENTIRE COUNTIES

Westchester

WAGES

Per hour: 07/01/2021 04/21/2022

*Electrician/A-Technician \$ 53.75 \$ 53.75

Teledata 53.75 53.75

*All new installations of wiring, conduit, junction boxes and light fixtures for projects with a base bid of more than \$325,000. For projects with a base bid of \$325,000 or less, see Maintenance and Repair rates.

Note: On a job where employees are required to work on bridges over navigable waters, transmission towers, light poles, bosun chairs, swinging scaffolds, etc. 40 feet or more above the water or ground or under compressed air, or tunnel projects under construction or where assisted breathing apparatus is required, they will be paid at the rate of time and one-half for such work except on normal pole line or building construction work.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker \$ 52.73 \$ 54.39

OVERTIME PAY

See (A, G, *J, P) on OVERTIME PAGE

*NOTE: Emergency work on Sunday and Holidays is at the time and one-half overtime rate.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1) year terms at the following wage rates:

	07/01/2021	01/01/2022	04/21/2022
1st term	\$ 14.00	\$ 15.00	\$ 15.00
2nd term	16.00	16.00	16.00
3rd term	18.00	18.00	18.00
4th term	20.00	20.00	20.00
MIJ 1-12 months	24.00	24.00	25.00
MIJ 13-18 months	27.50	27.50	28.50

Supplemental Benefits per hour:

	07/01/2021	04/21/2022
1st term	\$ 10.15	\$ 10.82
2nd term	13.05	13.05
3rd term	14.39	14.39
4th term	15.72	15.72
MIJ 1-12 months	13.39	13.49
MIJ 13-18 months	13.76	13.87

8-3/W

Electrician

09/01/2021

JOB DESCRIPTION Electrician

DISTRICT 8

ENTIRE COUNTIES

Westchester

WAGES

	07/01/2021	04/21/2022
Electrician -M	\$ 27.50	\$28.50
H - Telephone	\$ 27.50	\$28.50

All work with a base bid amount of \$325,000 or less. Including repairs and /or replacement of defective electrical and teledata equipment, all work necessary to retrofit, service, maintain and repair all kinds of lighting fixtures and local lighting controls, and washing and cleaning of foregoing fixtures.

*If the project exceeds \$375,000 due to changes in the scope of work, an Electrician/A Technician must be part of the labor ratio.

SUPPLEMENTAL BENEFITS

	07/01/2021	04/21/2022
Electrician &		
H - Telephone	\$ 13.76	\$13.87

OVERTIME PAY

See (B, G, *J, P) on OVERTIME PAGE

*Note: Emergency work on Sunday and Holidays is at the time and one-half overtime rate.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

8-3m

Elevator Constructor

09/01/2021

JOB DESCRIPTION Elevator Constructor

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

PARTIAL COUNTIES

Rockland: Entire County except for the Township of Stony Point

Westchester: Entire County except for the Townships of Bedford, Lewisboro, Cortland, Mt. Kisco, North Salem, Pound Ridge, Somers and Yorktown.

WAGES

Per hour:		
	07/01/2021	03/17/2022
Elevator Constructor	\$ 72.29	\$ 75.14
Modernization & Service/Repair	56.77	59.09

Four(4), ten(10) hour days may be worked at straight time during a week, Monday thru Friday.

NOTE- In order to use the '4 Day/10 Hour Work Schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 IS NOT SUBMITTED you will be liable for overtime payments for work over the allotted hours per day listed.

SUPPLEMENTAL BENEFITS

Per Hour:

Elevator Constructor	\$ 41.92	\$ 43.914
Modernization & Service/Repairs	41.082	42.787

OVERTIME PAY

Constructor See (D, M, T) on OVERTIME PAGE.

Modern/Service See (B, F, S) on OVERTIME PAGE.

HOLIDAY

Paid: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

WAGES PER HOUR:

*Note: 1st Term is based on Average wage of Constructor & Modernization.
Terms 2 thru 4 Based on Journeymans wage of classification Working in.

1 YEAR TERMS:

1st Term*	2nd Term	3rd Term	4th Term
50%	55%	65%	75%

SUPPLEMENTAL BENEFITS

Elevator Constructor		
1st Term	\$ 34.05	\$ 34.772
2nd Term	34.91	35.606
3rd Term	36.30	37.052
4th Term	37.70	38.497

Modernization & Service/Repair

1st Term	\$ 34.00	\$ 34.672
2nd Term	34.50	35.195
3rd Term	35.83	36.571
4th Term	37.15	37.938

4-1

Elevator Constructor

09/01/2021

JOB DESCRIPTION Elevator Constructor

DISTRICT 1

ENTIRE COUNTIES

Columbia, Dutchess, Greene, Orange, Putnam, Sullivan, Ulster

PARTIAL COUNTIES

Delaware: Towns of Andes, Bovina, Colchester, Davenport, Delhi, Harpersfield, Hemdon, Kortright, Meredith, Middletown, Roxbury, Hancock & Stamford

Rockland: Only the Township of Stony Point.

Westchester: Only the Townships of Bedford, Lewisboro, Cortland, Mt. Kisco, North Salem, Pound Ridge, Somers and Yorktown.

WAGES

Per Hour	07/01/2021	01/01/2022
Mechanic	\$ 62.51	\$ 64.63
Helper	70% of Mechanic Wage Rate	70% of Mechanic Wage Rate

Four (4), ten (10) hour days may be worked for New Construction and Modernization Work at straight time during a week, Monday thru Thursday or Tuesday thru Friday.

***Four (4), ten (10) hour days are not permitted for Contract Work/Repair Work

NOTE - In order to use the '4 Day/10 Hour Work Schedule' as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule', form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour	07/01/2021	01/01/2022
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Journeyman/Helper	\$ 35.825*	\$ 36.885*
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(*)Plus 6% of regular hourly if less than 5 years of service. Plus 8% of regular hourly rate if more than 5 years of service.

OVERTIME PAY

See (D, O) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 15, 16) on HOLIDAY PAGE

Overtime: See (5, 6, 15, 16) on HOLIDAY PAGE

Note: When a paid holiday falls on Saturday, it shall be observed on Friday. When a paid holiday falls on Sunday, it shall be observed on Monday.

REGISTERED APPRENTICES

Wages per hour:

0-6 mo*	6-12 mo	2nd yr	3rd yr	4th yr
50 %	55 %	65 %	70 %	80 %

(*)Plus 6% of the hourly rate, no additional supplemental benefits.

Supplemental Benefits per hour worked:

Same as Journeyman/Helper

1-138

Glazier	09/01/2021
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JOB DESCRIPTION Glazier

DISTRICT 8

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

WAGES

Per hour:	7/01/2021	11/01/2021
Glazier	\$ 58.60	+ \$1.25
*Scaffolding	59.55	
Glass Tinting & Window Film	29.60	
**Repair & Maintenance	29.60	

*Scaffolding includes swing scaffold, mechanical equipment, scissor jacks, man lifts, booms & buckets 24' or more, but not pipe scaffolding.

**Repair & Maintenance- All repair & maintenance work on a particular building, whenever performed, where the total cumulative contract value is under \$148,837. All Glass tinting, window film, regardless of material or intended use, and all affixing of decals to windows or glass.

SUPPLEMENTAL BENEFITS

Per hour:	7/01/2021
Journeyworker	\$ 36.04
Glass tinting & Window Film	21.19
Repair & Maintenance	21.19

OVERTIME PAY

See (B,H,V) on OVERTIME PAGE.

For 'Repair & Maintenance' and 'Glass Tinting & Window Film' see (B, B2, I, S) on overtime page.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (4, 6, 16, 25) on HOLIDAY PAGE

For 'Repair & Maintenance' and 'Glass Tinting & Window Film' Only

Paid: See(5, 6, 16, 25)

Overtime: See(5, 6, 16, 25)

REGISTERED APPRENTICES

Wage per hour:

(1) year terms at the following wage rates:

	7/01/2021
1st term	\$ 20.72

2nd term	28.66
3rd term	34.67
4th term	46.62

Supplemental Benefits:

(Per hour)

1st term	\$ 16.58
2nd term	23.57
3rd term	26.09
4th term	30.91

8-1087 (DC9 NYC)

Insulator - Heat & Frost

09/01/2021

JOB DESCRIPTION Insulator - Heat & Frost

DISTRICT 8

ENTIRE COUNTIES

Dutchess, Orange, Putnam, Rockland, Westchester

WAGES

Per hour:	07/01/2021	05/31/2022
Insulator	\$ 56.25	+ \$ 2.00
Discomfort & Additional Training**	59.22	+ \$ 2.00
Fire Stop Work*	30.07	+ \$ 2.00

* Applies on all exclusive Fire Stop Work (When contract is for Fire Stop work only). No apprentices on these contracts only.

**Applies to work requiring: garb or equipment worn against the body not customarily worn by insulators; psychological evaluation; special training, including but not limited to "Yellow Badge" radiation training

Note: Additional \$0.50 per hour for work 30 feet or more above floor or ground level.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker	\$ 35.10
Discomfort & Additional Training	37.06
Fire Stop Work:	
Journeyworker	17.90

OVERTIME PAY

See (B, E, E2, Q, *T) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Note: Last working day preceding Christmas and New Years day, workers shall work no later than 12:00 noon and shall receive 8 hrs pay.

Overtime: See (2*, 4, 6, 16, 25) on HOLIDAY PAGE.

*Note: Labor Day triple time if worked.

REGISTERED APPRENTICES

(1) year terms:

Insulator Apprentices:

1st	2nd	3rd	4th
\$ 30.07	\$ 35.30	\$ 40.54	\$ 45.78

Discomfort & Additional Training Apprentices:

1st	2nd	3rd	4th
\$ 31.55	\$ 37.08	\$ 42.61	\$ 48.16

Supplemental Benefits paid per hour:

Insulator Apprentices:

1st term	\$ 17.90
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2nd term	21.35
3rd term	24.79
4th term	28.23

Discomfort & Additional Training Apprentices:

1st term	\$ 18.89
2nd term	22.52
3rd term	26.16
4th term	29.80

8-91

Ironworker

09/01/2021

JOB DESCRIPTION Ironworker

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per Hour: 07/01/2021

Ironworker Rigger \$ 67.99

Ironworker Stone
Derrickman \$ 67.99

SUPPLEMENTAL BENEFITS

Per hour: \$ 41.44

OVERTIME PAY

See (B, D1, *E, Q, **V) on OVERTIME PAGE

*Time and one-half shall be paid for all work on Saturday up to eight (8) hours and double time shall be paid for all work thereafter.

** Benefits same premium as wages on Holidays only

HOLIDAY

Paid: See (18) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 25) on HOLIDAY PAGE

*Work stops at schedule lunch break with full day's pay.

REGISTERED APPRENTICES

Wage per hour:

1/2 year terms at the following hourly wage rate:

	1st	2nd	3rd	4th
07/01/2021	\$33.55	\$47.94	\$53.34	\$58.74

Supplemental benefits:

Per hour:				
07/01/2021	\$21.18	\$31.45	\$31.45	\$31.45

9-197D/R

Ironworker

09/01/2021

JOB DESCRIPTION Ironworker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per Hour:	07/01/2021	01/01/2022
		Additional
		\$ 1.25

Ornamental	\$ 46.15
Chain Link Fence	46.15
Guide Rail	46.15

SUPPLEMENTAL BENEFITS

Per hour:
Journeyworker: \$ 60.05

OVERTIME PAY

See (B, B1, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Apprentices hired before 8/31/2018:
(1/2) year terms at the following percentage of Journeyman's wage.

5th Term 80%

Supplemental Benefits per hour:

5th Term 54.03

Apprentices Hired after 9/1/18:

1 year terms

1st Term \$ 20.63

2nd Term 24.22

3rd Term 27.80

4th Term 31.38

Supplemental Benefits per hour:

1st Term \$ 17.89

2nd Term 19.14

3rd Term 20.40

4th Term 21.66

4-580-Or

Ironworker

09/01/2021

JOB DESCRIPTION Ironworker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

PER HOUR:

07/01/2021

01/01/2022

Ironworker:

Structural \$ 54.20

Bridges Additional \$ 1.75/Hr.

Machinery

SUPPLEMENTAL BENEFITS

PER HOUR PAID:

Journeyman \$ 82.35

OVERTIME PAY

See (B, B1, Q, *V) on OVERTIME PAGE

*NOTE: Benefits are calculated for every hour paid

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 18, 19) on HOLIDAY PAGE

REGISTERED APPRENTICES

WAGES PER HOUR:

6 month terms at the following rate:

1st \$28.21

2nd \$28.81

3rd - 6th \$29.42

Supplemental Benefits

PER HOUR PAID:

All Terms \$56.90

4-40/361-Str

Ironworker

09/01/2021

JOB DESCRIPTION Ironworker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

PARTIAL COUNTIES

Rockland: Southern section - south of Convent Road and east of Blue Hills Road.

WAGES

Per hour: 07/01/2021

Reinforcing &
Metal Lathing \$ 56.25

"Base" Wage \$ 54.70
plus \$ 1.55

"Base" Wage is used to calculate overtime hours only.

SUPPLEMENTAL BENEFITS

Per hour:
Reinforcing & Metal Lathing \$ 38.30

OVERTIME PAY

See (B, E, Q, *X) on OVERTIME PAGE

*Only \$22.00 per Hour for non worked hours

Supplemental Benefit Premiums for Overtime Hours worked:

Time & One Half \$ 45.08
Double Time \$ 51.33

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 13, 18, 19, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1) year terms at the following wage rates:

1st term	2nd term	3rd term	4th Term
Wage Per Hour: \$ 22.55	\$ 28.38	\$ 34.68	\$ 37.18
"Base" Wage \$ 21.00 plus \$1.55	\$ 26.80 plus \$1.58	\$ 33.10 plus \$1.58	\$ 35.60 plus \$1.58

"Base" Wage is used to calculate overtime hours ONLY.

SUPPLEMENTAL BENIFITS

Per Hour:

1st term	2nd term	3rd term	4th Term
\$ 18.17	\$ 21.34	\$ 22.00	\$ 20.50

4-46Reinf

Laborer - Building

09/01/2021

JOB DESCRIPTION Laborer - Building

DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

WAGES

07/01/2021

Laborer \$ 36.40
plus \$5.05**

Laborer - Asbestos & Hazardous
Materials Removal \$ 43.10*

* Abatement/Removal of:

- Lead based or lead containing paint on materials to be repainted is classified as Painter.
- Asbestos containing roofs and roofing material is classified as Roofer.

** This portion is not subject to overtime premium.

NOTE: Upgrade/Material condition work plan for work performed during non-outage under a wage formula of 90% wage/100% fringe benefits at nuclear power plants.

SUPPLEMENTAL BENEFITS

Per hour: 07/01/2021

Journeyworker \$ 27.50

OVERTIME PAY

See (B, E, E2, Q, *V) on OVERTIME PAGE

*Note: For Sundays and Holidays worked benefits are at the same premium as wages.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

LABORER ONLY

Hourly terms at the following wage:

Level A	Level B	Level C	Level D
0-1000	1001-2000	2001-3000	3001-4000
\$ 21.04	\$ 24.86	\$ 28.69	\$ 32.51

Supplemental Benefits per hour:

Apprentices
All terms \$ 21.15

8-235/B

Laborer - Heavy&Highway

09/01/2021

JOB DESCRIPTION Laborer - Heavy&Highway

DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

WAGES

PUTNAM: APPLIES TO ALL HEAVY & HIGHWAY WORK EXCLUDING HIGHWAYS, STREETS, AND BRIDGES

GROUP I: Blaster, Quarry Master, Curbs/Asphalt Screedman, Pipe Jacking and Boring Operations Operator, Qualified Dead Condition Pipe Fuser (B Mechanic)

GROUP II: Burner, Drillers(jumbo, joy, wagon, air track, hydraulic), Drill Operator, Self Contained Rotary Drill, Curbs, Raker, Bar Person, Concrete Finisher.

GROUP III: Pavement Breakers, Jeep Operator, Jack Hammer, Pneumatic Tools (all), Gas Driller, Guniting, Railroad Spike Puller, Pipelayer, Chain Saw, Deck winches on scows, Power Buggy Operator, Power Wheelbarrow Operator, Bar Person Helper, Compressed Air lance, Water Jet Lance.

GROUP IV: Concrete Laborers, Asph. Worker, Rock Scaler, Vibrator Oper., Bit Grinder, Air Tamper, Pumps, Epoxy (adhesives, fillers and troweled on), Barco Rammer, Concrete Grinder, Crack Router Operator, Guide Rail-digging holes and placing concrete and demolition when not to be replaced, distribution of materials and tightening of bolts.

GROUP V: Drillers Helpers, Common Laborer, Mason Tenders, Signal Person, Pit Person, Truck Spotter, Powder Person, Landscape/Nursery Person, Dump Person, Temp. Heat.

GROUP VIA: Asbestos/Toxic Waste Laborer-All removal (Roads, Tunnels, Landfills, etc.) Confined space laborer, Bio-remediation, Phyto-remediation, Lead or Hazardous material, Abatement Laborer.

Wages:(per hour) 07/01/2021

GROUP I	\$45.65*
GROUP II	44.30*
GROUP III	43.90*
GROUP IV	43.55*

GROUP V	43.20*
GROUP VIA	45.20*
Operator Qualified	
Gas Mechanic(A Mech)	55.65*
Flagperson	36.85*

*NOTE: To calculate overtime premiums, deduct \$0.10 from above wages

SHIFT WORK: A shift premium will be paid on Public Work contracts for off-shift or irregular shift work when mandated by the NYS D.O.T. or other Governmental Agency contracts. Employees shall receive an additional 15% per hour above current rate for all regular and irregular shift work. Premium pay shall be calculated using the 15% per hour differential as base rate.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker:

First 40 Hours

Per Hour \$26.10

Over 40 Hours

Per Hour 19.85

OVERTIME PAY

See (B, E, P, R, S) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

NOTE: For Holiday Overtime: 5, 6 - Code 'S' applies

For Holiday Overtime: 8, 15, 25, 26 - Code 'R' applies

REGISTERED APPRENTICES

	1st term	2nd term	3rd term	4th term
	1-1000hrs	1001-2000hrs	2001-3000hrs	3001-4000hrs
07/01/2021	\$ 24.56	\$ 28.98	\$ 33.40	\$ 37.72

Supplemental Benefits per hour:

1st term	\$ 4.70 - After 40 hours: \$ 4.45
2nd term	\$ 4.80 - After 40 hours: \$ 4.45
3rd term	\$ 5.30 - After 40 hours: \$ 4.85
4th term	\$ 5.85 - After 40 hours: \$ 5.35

8-60H/H

Laborer - Tunnel

09/01/2021

JOB DESCRIPTION Laborer - Tunnel

DISTRICT 11

ENTIRE COUNTIES

Columbia, Dutchess, Greene, Orange, Otsego, Putnam, Rockland, Sullivan, Ulster, Westchester

PARTIAL COUNTIES

Chenango: Townships of Columbus, Sherburne and New Berlin.

Delaware: Townships of Andes, Bovina, Middletown, Roxbury, Franklin, Hamden, Stamford, Delhi, Kortright, Harpersfield, Merideth and Davenport.

WAGES

Class 1: All support laborers/sandhogs working above the shaft or tunnel.

Class 2: All laborers/sandhogs working in the shaft or tunnel.

Class 4: Safety Miners

Class 5: Site work related to Shaft/Tunnel

WAGES: (per hour)

	07/01/2021	07/01/2022
Class 1	\$ 51.95	\$ 53.45
Class 2	54.10	55.60
Class 4	60.50	62.00
Class 5	43.50	44.80

Toxic and hazardous waste, lead abatement and asbestos abatement work will be paid an additional \$ 3.00 an hour.

SHIFT DIFFERENTIAL...On all Government mandated irregular shift work:

- Employee shall be paid at time and one half the regular rate Monday through Friday.
- Saturday shall be paid at 1.65 times the regular rate.
- Sunday shall be paid at 2.15 times the regular rate.

SUPPLEMENTAL BENEFITS

Per hour:

Benefit 1	\$ 33.25	\$ 34.45
Benefit 2	49.81	51.60
Benefit 3	66.35	68.75

Benefit 1 applies to straight time hours, paid holidays not worked.

Benefit 2 applies to over 8 hours in a day (M-F), irregular shift work hours worked, and Saturday hours worked.

Benefit 3 applies to Sunday and Holiday hours worked.

OVERTIME PAY

See (B, E, Q, X) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 15, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 15, 16, 25) on HOLIDAY PAGE

When a recognized Holidays falls on Saturday or Sunday, holidays falling on Saturday shall be recognized or observed on Friday and holidays falling on Sunday shall be recognized or observed on Monday. Employees ordered to work on the Saturday or Sunday of the holiday or on the recognized or the observed Friday or Monday for those holidays falling on Saturday or Sunday shall receive double time the established rate and benefits for the holiday.

REGISTERED APPRENTICES

FOR APPRENTICE RATES, refer to the appropriate Laborer Heavy & Highway wage rate contained in the wage schedule for the County and location where the work is to be performed.

11-17/60/235/754Tun

Lineman Electrician

09/01/2021

JOB DESCRIPTION Lineman Electrician

DISTRICT 6

ENTIRE COUNTIES

Westchester

WAGES

Below rates apply to electrical overhead and underground distribution and maintenance work and overhead and underground transmission line work, electrical substations, switching structures, continuous pipe-type underground fluid or gas filled transmission conduit and cable installations, maintenance jobs or projects, railroad catenary installations and maintenance, third rail installations, the bonding of rails and the installation of fiber optic cable. (Ref #14.04.01)

Includes Teledata Work performed within ten (10) feet of high voltage (600 volts or over) transmission lines.

Per hour:	07/01/2021	05/02/2022	05/01/2023	05/06/2024
Lineman, Tech, Welder	\$ 57.71	\$ 59.01	\$ 60.41	\$ 61.91
Crane, Crawler Backhoe	57.71	59.01	60.41	61.91
Cable Splicer-Pipe Type	63.48	64.91	66.45	68.10
Digging Mach Operator	51.94	53.11	54.37	55.72
Cert. Welder-Pipe Type	60.60	61.96	63.43	65.01
Tractor Trailer Driver	49.05	50.16	51.35	52.62
Groundman, Truck Driver	46.17	47.21	48.33	49.53
Equipment Mechanic	46.17	47.21	48.33	49.53
Flagman	34.63	35.41	36.25	37.15

Additional \$1.00 per hour for entire crew when a helicopter is used.

NOTE: THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED BETWEEN THE HOURS LISTED BELOW:

1ST SHIFT	8:00 AM TO 4:30 PM REGULAR RATE
2ND SHIFT	4:30 PM TO 1:00 AM REGULAR RATE PLUS 17.3%
3RD SHIFT	12:30 AM TO 9:00 AM REGULAR RATE PLUS 31.4%

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day. Tuesday thru Friday may be worked with no make-up day.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked (but also required on non-worked holidays):

	\$25.40 *plus 7% of hourly Wage	\$ 25.90 *plus 7% of hourly wage	\$ 26.40 *plus 7% of hourly wage	\$ 26.90 *plus 7% of hourly wage
Journeyman Lineman or Equipment Operators with Crane License	\$ 26.40 *plus 7% of hourly wage	\$ 27.90 *plus 7% of hourly wage	\$ 29.40 *plus 7% of hourly wage	\$ 30.90 *plus 7% of hourly wage

*The 7% is based on the hourly wage paid, straight time or premium time.

OVERTIME PAY

See (B, E, Q,) on OVERTIME PAGE. *Note* Double time for emergency work designated by the Dept of Jurisdiction.

NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked.
Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Governor of NYS Election Day.
Overtime See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Governor of NYS Election Day.

NOTE: All paid holidays falling on Saturday shall be observed on the preceding Friday. All paid holidays falling on Sunday shall be observed on the following Monday. Supplements for holidays paid at straight time.

REGISTERED APPRENTICES

WAGES per hour: 1000 hour terms at the following percentage of the applicable Journeyman Lineman wage.

1st	2nd	3rd	4th	5th	6th	7th
60%	65%	70%	75%	80%	85%	90%

SUPPLEMENTAL BENEFITS per hour:

07/01/2021	05/02/2022	05/01/2023	05/06/2024
\$25.40 *plus 7% of hourly Wage	\$ 25.90 *plus 7% of hourly wage	\$ 26.40 *plus 7% of hourly wage	\$ 26.90 *plus 7% of hourly wage

*The 7% is based on the hourly wage paid, straight time or premium time.

6-1249aWest

Lineman Electrician - Teledata

09/01/2021

JOB DESCRIPTION Lineman Electrician - Teledata

DISTRICT 6

ENTIRE COUNTIES

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

Per hour:

For outside work, stopping at first point of attachment (demarcation).

07/01/2021

Cable Splicer	\$ 34.78
Installer, Repairman	\$ 33.01
Teledata Lineman	\$ 33.01
Tech., Equip. Operator	\$ 33.01
Groundman	\$ 17.50

NOTE: EXCLUDES Teledata work within ten (10) feet of High Voltage (600 volts and over) transmission lines. For this work please see LINEMAN.

NOTE: THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED:

1ST SHIFT

REGULAR RATE

2ND SHIFT REGULAR RATE PLUS 10%
3RD SHIFT REGULAR RATE PLUS 15%

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman \$ 5.14
*plus 3% of
wage paid

*The 3% is based on the hourly wage paid, straight time rate or premium rate.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked.
Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 16) on HOLIDAY PAGE

6-1249LT - Teledata

Lineman Electrician - Traffic Signal, Lighting

09/01/2021

JOB DESCRIPTION Lineman Electrician - Traffic Signal, Lighting

DISTRICT 6

ENTIRE COUNTIES

Westchester

WAGES

Lineman/Technician shall perform all overhead aerial work. A Lineman/Technician on the ground will install all electrical panels, connect all grounds, install and connect all electrical conductors which includes, but is not limited to road loop wires; conduit and plastic or other type pipes that carry conductors, flex cables and connectors, and to oversee the encasement or burial of such conduits or pipes.

A Groundman/Groundman Truck Driver shall: Build and set concrete forms, handle steel mesh, set footer cages, transport concrete in a wheelbarrow, hand or machine concrete vibrator, finish concrete footers, mix mortar, grout pole bases, cover and maintain footers while curing in cold weather, operate jack hammer, operate hand pavement breaker, tamper, concrete and other motorized saws, as a drill helper, operate and maintain generators, water pumps, chainsaws, sand blasting, operate mulching and seeding machine, air tools, electric tools, gas tools, load and unload materials, hand shovel and/or broom, prepare and pour mastic and other fillers, assist digger operator equipment operator in ground excavation and restoration, landscape work and painting. Only when assisting a lineman technician, a groundman/truck driver may assist in installing conduit, pipe, cables and equipment.

A flagger's duties shall consist of traffic control only.
(Ref #14.01.03)

Per hour:	07/01/2021	05/02/2022	05/01/2023	05/06/2024
Lineman, Technician	\$ 52.56	\$ 53.60	\$ 54.73	\$ 55.95
Crane, Crawler Backhoe	52.56	53.60	54.73	55.95
Certified Welder	55.19	56.28	57.47	58.75
Digging Machine	47.30	48.24	49.26	50.36
Tractor Trailer Driver	44.68	45.56	46.52	47.56
Groundman, Truck Driver	42.05	42.88	43.78	44.76
Equipment Mechanic	42.05	42.88	43.78	44.76
Flagman	31.54	32.16	32.84	33.57

Above rates are applicable for installation, testing, operation, maintenance and repair on all Traffic Control (Signal) and Illumination (Lighting) projects, Traffic Monitoring Systems, and Road Weather Information Systems. Includes digging of holes for poles, anchors, footer foundations for electrical equipment; assembly of all electrical materials or raceway; placing of fish wire; pulling of cables, wires or fiber optic cable through such raceways; splicing of conductors; dismantling of such structures, lines or equipment.

NOTE: THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED BETWEEN THE HOURS LISTED BELOW:

1ST SHIFT 8:00 AM TO 4:30 PM REGULAR RATE
2ND SHIFT 4:30 PM TO 1:00 AM REGULAR RATE PLUS 17.3%
3RD SHIFT 12:30 AM TO 9:00 AM REGULAR RATE PLUS 31.4%

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day. Tuesday thru Friday may be worked with no make-up day.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked (but also required on non-worked holidays):

	\$25.40 *plus 7% of hourly Wage	\$ 25.90 *plus 7% of hourly wage	\$ 26.40 *plus 7% of hourly wage	\$ 26.90 *plus 7% of hourly wage
Journeyman Lineman or Equipment Operators with Crane License	\$ 26.40 *plus 7% of hourly wage	\$ 27.90 *plus 7% of hourly wage	\$ 29.40 *plus 7% of hourly wage	\$ 30.90 *plus 7% of hourly wage

*The 7% is based on the hourly wage paid, straight time or premium time.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE. *Note* Double time for emergency work designated by the Dept. of Jurisdiction.

NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid: See (5, 6, 8, 13, 25) on HOLIDAY PAGE and Governor of NYS Election Day.

Overtime: See (5, 6, 8, 13, 25) on HOLIDAY PAGE and Governor of NYS Election Day.

NOTE: All paid holidays falling on Saturday shall be observed on the preceding Friday. All paid holidays falling on Sunday shall be observed on the following Monday. Supplements for holidays paid at straight time.

REGISTERED APPRENTICES

WAGES per hour: 1000 hour terms at the following percentage of the applicable Journeyman Lineman wage.

1st	2nd	3rd	4th	5th	6th	7th
60%	65%	70%	75%	80%	85%	90%

SUPPLEMENTAL BENEFITS per hour:

07/01/2021	05/02/2022	05/01/2023	05/06/2024
\$25.40 *plus 7% of hourly Wage	\$ 25.90 *plus 7% of hourly wage	\$ 26.40 *plus 7% of hourly wage	\$ 26.90 *plus 7% of hourly wage

*The 7% is based on the hourly wage paid, straight time or premium time.

6-1249aWestLT

Mason - Building

09/01/2021

JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Nassau, Rockland, Suffolk, Westchester

WAGES

Per hour:	07/01/2021	12/06/2021 Additional	06/06/2022 Additional
Tile Setters	\$ 61.07	\$ 0.48	\$ 0.72

SUPPLEMENTAL BENEFITS

Per Hour:	\$ 24.91* + \$10.01
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* This portion of benefits subject to same premium rate as shown for overtime wages.

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

Work beyond 10 hours on Saturday shall be paid at double the hourly wage rate.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage per hour:

Tile Setters:
(750 hour) term at the following wage rate:

Term:	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
	1-750	751-1500	1501-2250	2251-3000	3001-3750	3751-4500	4501-5250	5251-6000	6001-6750	6501-7000
07/01/2021	\$20.84	\$25.66	\$32.68	\$37.50	\$40.99	\$44.30	\$47.82	\$52.63	\$55.35	\$59.34

Supplemental Benefits per hour:

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$12.55* +\$0.66	\$12.55* +\$0.71	\$15.16* +\$0.81	\$15.16* +\$0.85	\$16.16* +\$1.23	\$17.66* +\$1.28	\$18.66* +\$1.63	\$18.66* +\$1.68	\$16.66* +\$5.83	\$21.91* +\$6.32

* This portion of benefits subject to same premium rate as shown for overtime wages.

9-7/52A

Mason - Building	09/01/2021
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JOB DESCRIPTION Mason - Building

DISTRICT 11

ENTIRE COUNTIES

Putnam, Rockland, Westchester

PARTIAL COUNTIES

Orange: Only the Township of Tuxedo.

WAGES

Per hour:

	07/01/2021	06/01/2022 Additional	06/01/2023 Additional
Bricklayer	\$ 43.35	\$ 2.39	\$ 2.05
Cement Mason	43.35	2.39	2.05
Plasterer/Stone Mason	43.35	2.39	2.05
Pointer/Caulker	43.35	2.39	2.05

Additional \$1.00 per hour for power saw work

Additional \$0.50 per hour for swing scaffold or staging work

SHIFT WORK: When shift work or an irregular work day is mandated or required by state, federal, county, local or other governmental agency contracts, the following premiums apply:

Irregular work day requires 15% premium

Second shift an additional 15% of wage plus benefits to be paid

Third shift an additional 25% of wage plus benefits to be paid

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman \$ 36.05.

OVERTIME PAY

OVERTIME:

Cement Mason See (B, E, Q, W) on OVERTIME PAGE.

All Others See (B, E, Q) on OVERTIME PAGE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

Whenever any of the above holidays fall on Sunday, they will be observed on Monday. Whenever any of the above holidays fall on Saturday, they will be observed on Friday.

REGISTERED APPRENTICES

Wages per hour:

750 hour terms at the following percentage of Journeyman's wage

1st	2nd	3rd	4th	5th	6th	7th	8th
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50% 55% 60% 65% 70% 75% 80% 85%

Supplemental Benefits per hour

750 hour terms at the following percentage of journeyman supplements

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	85%

Apprentices indentured before June 1st, 2011 receive full journeyman benefits

11-5wp-b

Mason - Building	09/01/2021
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JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Building

07/01/2021	01/01/2022
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Wages per hour:

Mosaic & Terrazzo Mechanic	\$ 58.46	Additional \$ 0.85
Mosaic & Terrazzo Finisher	\$ 56.86	

SUPPLEMENTAL BENEFITS

Per hour:

Mosaic & Terrazzo Mechanic	\$ 26.11* + \$11.73
Mosaic & Terrazzo Finisher	\$ 26.11* + \$11.71

*This portion of benefits subject to same premium rate as shown for overtime wages.

OVERTIME PAY

See (A, E, Q) on OVERTIME PAGE

Deduct \$6.80 from hourly wages before calculating overtime.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

Easter Sunday is an observed holiday. Holidays falling on a Saturday will be observed on that Saturday. Holidays falling on a Sunday will be celebrated on the Monday.

REGISTERED APPRENTICES

Wages per hour:

(750 Hour) terms at the following wage rate.

	1st	2nd	3rd	4th	5th	6th	7th	8th
07/01/2021	\$ 25.82	\$ 28.40	\$ 31.00	\$ 33.58	\$ 36.16	\$ 38.74	\$ 43.91	\$ 49.08

Supplemental benefits per hour:

07/01/2021	\$13.06* +\$9.27	\$14.37* +\$10.19	\$15.67* +\$11.12	\$16.98* +\$12.04	\$18.28* +\$12.97	\$19.59* +\$13.90	\$22.20* +\$15.75	\$24.81* +\$17.60
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Apprentices hired after 07/01/2017:

Wages Per hour:

1st	2nd	3rd	4th	5th	6th
0- 1500	1501- 3000	3001- 3750	3751- 4500	4501- 5250	5251- 6000

07/01/2021	\$ 22.63	\$ 29.10	\$ 31.00	\$ 36.16	\$ 41.32	\$ 46.48
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Supplemental Benefits per hour:

	1st	2nd	3rd	4th	5th	6th
07/01/2021	\$4.59*	\$5.90*	\$15.67*	\$18.28*	\$20.89*	\$23.50*
	+\$6.49	+\$8.34	+\$11.12	+\$12.97	+\$14.83	+\$16.67

*This portion of benefits subject to same premium rate as shown for overtime wages.

9-7/3

Mason - Building	09/01/2021
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JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour: 07/01/2021 01/01/2022

Building-Marble Restoration: Additional

Marble, Stone & Terrazzo Polisher, etc \$ 46.16 \$ 1.10

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker:

Building-Marble Restoration:

Marble, Stone & Polisher \$ 29.11

OVERTIME PAY

See (B, *E, Q, V) on OVERTIME PAGE

*ON SATURDAYS, 8TH HOUR AND SUCCESSIVE HOURS PAID AT DOUBLE HOURLY RATE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 15, 25) on HOLIDAY PAGE

1ST TERM APPRENTICE GETS PAID FOR ALL OBSERVED HOLIDAYS.

REGISTERED APPRENTICES

WAGES per hour:

900 hour term at the following wage:

	1st 1- 900	2nd 901- 1800	3rd 1801- 2700	4th 2701
07/01/2021	\$32.28	\$36.91	\$41.51	\$46.16

Supplemental Benefits Per Hour:

07/01/2021	\$26.47	\$27.34	\$28.29	\$29.11
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9-7/24-MP

Mason - Building	09/01/2021
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JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

WAGES

Wages: 07/01/2021 01/03/2022

Marble Cutters & Setters \$ 61.73 Additional \$ 0.95

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker \$ 37.76

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage Per Hour:

750 hour terms at the following wage.

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
1-750	751-1500	1501-2250	2251-3000	3001-3750	3751-4500	4501-5250	5251-6000	6001-6751	6751-7500
\$ 24.70	\$ 27.77	\$ 30.87	\$ 33.94	\$ 37.03	\$ 40.11	\$ 43.20	\$ 46.29	\$ 52.46	\$ 58.64

Supplemental Benefits per hour:

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 20.01	\$ 21.43	\$ 22.83	\$ 24.25	\$ 25.65	\$ 27.07	\$ 28.47	\$ 29.88	\$ 32.70	\$ 35.51

9-7/4

Mason - Building

09/01/2021

JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Nassau, Rockland, Suffolk, Westchester

WAGES

Per hour:	07/01/2021	12/06/2021	06/06/2022
Tile Finisher	\$ 46.89	Additional \$ 0.39	Additional \$ 0.58

SUPPLEMENTAL BENEFITS

Per Hour:

\$ 21.91*
+ \$9.84

*This portion of benefits subject to same premium rate as shown for overtime wages

OVERTIME PAY

See (B, E, Q, *V) on OVERTIME PAGE

Work beyond 10 hours on a Saturday shall be paid at double the hourly wage rate.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

9-7/88A-tf

Mason - Building

09/01/2021

JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour:	07/01/2021	01/01/2022
Marble, Stone, etc. Maintenance Finishers:	\$ 26.73	Additional \$ 0.68

Note 1: An additional \$2.00 per hour
for time spent grinding floor using
"60 grit" and below.

Note 2: Flaming equipment operator
shall be paid an additional \$25.00 per day.

SUPPLEMENTAL BENEFITS

Per Hour:

Marble, Stone, etc
Maintenance Finishers: \$ 14.00

OVERTIME PAY

See (B, *E, Q, V) on OVERTIME PAGE

*Double hourly rate after 8 hours on Saturday

HOLIDAY

Paid: See (5, 6, 8, 11, 15, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 15, 25) on HOLIDAY PAGE

1st term apprentice gets paid for all observed holidays.

REGISTERED APPRENTICES

WAGES per hour:

07/01/2021

0-750	\$21.37
751-1500	\$22.09
1501-2250	\$22.81
2251-3000	\$23.52
3001-3750	\$24.61
3751-4500	\$26.04
4501+	\$26.73

Supplemental Benefits:

Per hour:

0-750	\$ 11.24
751-1500	\$ 11.60
1501-2250	\$ 11.97
2251-3000	\$ 12.35
3001-3750	\$ 12.84
3751-4500	\$ 13.63
4501+	\$ 14.00

9-7/24M-MF

Mason - Building / Heavy&Highway

09/01/2021

JOB DESCRIPTION Mason - Building / Heavy&Highway

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour: 07/01/2021 01/03/2022

Marble-Finisher	\$ 48.87	Additional \$ 0.61
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SUPPLEMENTAL BENEFITS

Journeyworker:
per hour

Marble- Finisher \$ 35.25

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

HOLIDAY

Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

* Work beyond 8 hours on a Saturday shall be paid at double the rate.

** When an observed holiday falls on a Sunday, it will be observed the next day.

9-7/20-MF

Mason - Heavy&Highway

09/01/2021

JOB DESCRIPTION Mason - Heavy&Highway

DISTRICT 11

ENTIRE COUNTIES

Putnam, Rockland, Westchester

PARTIAL COUNTIES

Orange: Only the Township of Tuxedo.

WAGES

Per hour:

	07/01/2021	06/01/2022 Additional	06/01/2023 Additional
Bricklayer	\$ 43.85	\$ 2.39	\$ 2.05
Cement Mason	43.85	2.39	2.05
Marble/Stone Mason	43.85	2.39	2.05
Plasterer	43.85	2.39	2.05
Pointer/Caulker	43.85	2.39	2.05

Additional \$1.00 per hour for power saw work

Additional \$0.50 per hour for swing scaffold or staging work

SHIFT WORK: When shift work or an irregular work day is mandated or required by state, federal, county, local or other governmental contracts, the following rates apply:

Irregular work day requires 15% premium

Second shift an additional 15% of wage plus benefits to be paid

Third shift an additional 25% of wage plus benefits to be paid

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman \$ 36.05

OVERTIME PAY

Cement Mason See (B, E, Q, W, X)

All Others See (B, E, Q, X)

HOLIDAY

Paid: See (5, 6, 16, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

Whenever any of the above holidays fall on Sunday, they will be observed on Monday. Whenever any of the above holidays fall on Saturday, they will be observed on Friday.

REGISTERED APPRENTICES

Wages per hour:

750 hour terms at the following percentage of Journeyman's wage

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	85%

Supplemental Benefits per hour

750 hour terms at the following percentage of journeyman supplements

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	85%

Apprentices indentured before June 1st, 2011 receive full journeyman benefits

11-5WP-H/H

Operating Engineer - Building

09/01/2021

JOB DESCRIPTION Operating Engineer - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Putnam, Queens, Richmond, Westchester

PARTIAL COUNTIES

Dutchess: that part of Dutchess County lying south of the North City Line of the City of Poughkeepsie.

WAGES

NOTE:Construction surveying

Party Chief--One who directs a survey party

Instrument Man--One who runs the instrument and assists Party Chief.

Rodman--One who holds the rod and assists the Survey Crew

Wages:(Per Hour) 07/01/2021

Building Construction:

Party Chief	\$ 76.09
Instrument Man	\$ 60.41
Rodman	\$ 41.11

Steel Erection:

Party Chief	\$ 79.02
Instrument Man	\$ 62.89
Rodman	\$ 44.03

**Heavy Construction-NYC counties only:
(Foundation, Excavation.)**

Party Chief	\$ 84.60
Instrument man	\$ 63.79
Rodman	\$ 54.52

SUPPLEMENTAL BENEFITS

Per Hour:	07/01/2021
Building Construction	\$ 24.40* +\$ 7.15
Steel Erection	\$ 25.00* +\$ 7.15
Heavy Construction	\$ 25.25* +\$ 7.15

* This portion subject to same premium as wages

Non-Worked Holiday Supplemental Benefit:	\$ 16.45
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OVERTIME PAY

See (A, B, E, Q) on OVERTIME PAGE

Code "A" applies to Building Construction and has double the rate after 7 hours on Saturdays.

Code "B" applies to Heavy Construction and Steel Erection and had double the rate after 8 hours on Saturdays.

HOLIDAY

Paid:	See (5, 6, 9, 11, 15, 16, 25) on HOLIDAY PAGE
Overtime:	See (5, 6, 9, 11, 15, 16, 25) on HOLIDAY PAGE

9-15Db

Operating Engineer - Building

09/01/2021

JOB DESCRIPTION Operating Engineer - Building

DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: All the counties of Westchester and Putnam and the southern part of Dutchess County defined by the northern boundary line of the City of Poughkeepsie, then due east to Route 115, then north along Route 115 to Bedell Road, then east along Bedell Road to Van Wagner Road, then north along Van Wagner Road to Bower Road, then east along Bower Road to Route 44 and along Route 44 east to Route 343, then along Route 343 east to the northern boundary of Town of Dover Plains and east along the northern boundary of Town of Dover Plains to the border line of the State of Connecticut and bordered on the west by the middle of the Hudson River.

WAGES

GROUP I:

Cranes (All Types up to 49 tons), Boom Trucks, Cherry Pickers (All Types), Clamshell Crane, Derrick (Stone and Steel), Dragline, Franki Pile Rig or similar, High Lift (Lull or similar) with crane attachment and winch used for hoisting or lifting, Hydraulic Cranes, Pile Drivers, Potain and similar.

Cranes (All types 50-99 tons), Drill Rig Casa Grande (CAT or similar), Franki Pile Rig or similar, Hydraulic Cranes (All types including Crawler Cranes- No specific boom length).

Cranes (All types 100 tons and over), All Tower Cranes, All Climbing Cranes irrespective of manufacturer and regardless of how the same is rigged, Franki Pile Rig or similar, Conventional Cranes (All types including Crawler Cranes-No specific boom length), Hydraulic Cranes.

GROUP I-A: Barber Green Loader-Euclid Loader, Bulldozer, Carrier-Trailer Horse, Concrete Cleaning Decontamination Machine Operator, Concrete-Portable Hoist, Conway or Similar Mucking Machines, Elevator & Cage, Excavators all types, Front End Loaders, Gradall, Shovel, Backhoe, etc. (Crawler or Truck), Heavy Equipment Robotics Operator/Mechanic, Hoist Engineer-Material, Hoist Portable Mobile Unit, Hoist (Single, Double or Triple Drum), Horizontal Directional Drill Locator, Horizontal Directional Drill Operator and Jersey Spreader, Letourneau or Tournapull (Scrapers over 20 yards Struck), Lift Slab Console, etc., Lull HiLift or Similar, Master Environmental Maintenance Mechanics, Mucking Machines Operator/Mechanic or Similar Type, Overhead Crane, Pavement Breaker (Air Ram), Paver (Concrete), Post Hole Digger, Power House Plant, Road Boring Machine, Road Mix Machine, Ross Carrier and Similar Machines, Rubber tire double end backhoes and similar machines, Scoopmobile Tractor-Shovel Over 1.5 yards, Shovel (Tunnels), Spreader (Asphalt) Telephie (Cableway), Tractor Type Demolition Equipment, Trenching Machines-Vermeer Concrete Saw Trencher and Similar, Ultra High Pressure Waterjet Cutting Tool System, Vacuum Blasting Machine operator/mechanic, Winch Truck A Frame.

GROUP I-B: Compressor (Steel Erection), Mechanic (Outside All Types), Negative Air Machine (Asbestos Removal), Push Button (Buzz Box) Elevator.

GROUP II: Compactor Self-Propelled, Concrete Pump, Crane Operator in Training (Over 100 Tons), Grader, Machines Pulling Sheep's Foot Roller, Roller (4 ton and over), Scrapers (20 yards Struck and Under), Vibratory Rollers, Welder.

GROUP III-A: Asphalt Plant, Concrete Mixing Plants, Forklift (All power sources), Joy Drill or similar, Tractor Drilling Machine, Loader (1 1/2 yards and under), Portable Asphalt Plant, Portable Batch Plant, Portable Crusher, Skid Steer (Bobcat or similar), Stone Crusher, Well Drilling Machine, Well Point System.

GROUP III-B: Compressor Over 125 cu. Feet, Conveyor Belt Machine regardless of size, Compressor Plant, Ladder Hoist, Stud Machine.

GROUP IV-A: Batch Plant, Concrete Breaker, Concrete Spreader, Curb Cutter Machine, Finishing Machine-Concrete, Fine Grading Machine, Hepa Vac Clean Air Machine, Material Hopper (sand, stone, cement), Mulching Grass Spreader, Pump Gypsum etc, Pump-Plaster-Grout-Fireproofing. Roller (Under 4 Ton), Spreading and Fine Grading Machine, Steel Cutting Machine, Siphon Pump, Tar Joint Machine, Television Cameras for Water, Sewer, Gas etc. Turbo Jet Burner or Similar Equipment, Vibrator (1 to 5).

GROUP IV-B: Compressor (all types), Heater (All Types), Fire Watchman, Lighting Unit (Portable & Generator) Pump, Pump Station (Water, Sewer, Portable, Temporary), Welding Machine (Steel Erection & Excavation).

GROUP V: Mechanics Helper, Motorized Roller (walk behind), Stock Attendant, Welder's Helper, Maintenance Engineer Crane (75 ton and over).

Group VI-A: Welder Certified

GROUP VI-B: Utility Man, Warehouse Man.

WAGES: (per hour)

	07/01/2021	3/7/2022	3/6/2023
GROUP I			
Cranes- up to 49 tons	\$ 63.86	\$ 65.03	\$ 66.23
Cranes- 50 tons to 99 tons	66.07	67.28	68.53
Cranes- 100 tons and over	75.37	76.77	78.21
GROUP I-A	55.96	56.97	58.01
GROUP I-B	51.60	52.52	53.48
GROUP II	54.00	54.98	55.70
GROUP III-A	52.04	52.97	53.94
GROUP III-B	49.56	50.44	51.35
GROUP IV-A	51.52	52.44	53.40
GROUP IV-B	43.62	44.38	45.17
GROUP V	47.00	47.83	48.69
Group VI-A	54.94	55.93	56.96
GROUP VI-B			
Utility Man	44.61	45.39	46.21
Warehouse Man	46.74	47.57	48.42

An additional 20% to wage when required to wear protective equipment on hazardous/toxic waste projects.

Engineers operating cranes with booms 100 feet but less than 149 feet in length will be paid an additional \$2.00 per hour.

Engineers operating cranes with booms 149 feet or over in length will be paid an additional \$3.00 per hour.

Loader operators over 5 cubic yard capacity additional .50 per hour.

Shovel operators over 4 cubic yard capacity additional \$1.00 per hour.

SUPPLEMENTAL BENEFITS

Per hour:

	07/01/2021	03/07/2022	03/06/2023
Journeyworker	\$ 29.17	\$ 29.87	\$ 30.57

OVERTIME PAY

See (B, E, Q, *V) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

8-137B

Operating Engineer - Heavy&Highway

09/01/2021

JOB DESCRIPTION Operating Engineer - Heavy&Highway

DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: All the counties of Westchester and Putnam and the southern part of Dutchess County defined by the northern boundary line of the City of Poughkeepsie, then due east to Route 115, then north along Route 115 to Bedell Road, then east along Bedell Road to Van Wagner Road, then north along Van Wagner Road to Bower Road, then east along Bower Road to Route 44 and along Route 44 east to Route 343, then along Route 343 east to the northern boundary of Town of Dover Plains and east along the northern boundary of Town of Dover Plains to the border line of the State of Connecticut and bordered on the west by the middle of the Hudson River.

WAGES

GROUP I: Boom Truck, Cherry Picker, Clamshell, Crane, (Crawler, Truck),
Dragline, Drill Rig (Casa Grande, Cat, or Similar), Floating Crane (Crane on Barges) under 100 tons, Gin Pole, Hoist Engineer-Concrete (Crane-Derrick-Mine Hoist), Knuckle Boom Crane, Rough Terrain Crane.

GROUP I-A: Auger (Truck or Truck Mounted), Boat Captain, Bulldozer-All Sizes, Central Mix Plant Operator, Chipper (all types), Close Circuit T.V., Combination Loader/Backhoe, Compactor with Blade, Concrete Finishing Machine, Gradall, Grader (Motor Grader), Elevator & Cage (Materials or Passenger), Excavator (and all attachments), Front End Loaders (1 1/2 yards and over), High Lift Lull and similar, Hoist (Single, Double, Triple Drum), Hoist Portable Mobile Unit, Hoist Engineer (Material), Jack and Bore Machine, Log Skidders, Mill Machines, Mucking Machines, Overhead Crane, Paver (concrete), Post Pounder (of any type), Push Cats, Road Reclaimer, Robot Hammer (Brokk or similar), Robotic Equipment (Scope of Engineer Schedule), Ross Carrier and similar, Scrapers (20 yard struck and over), Side Boom, Slip Form Machine, Spreader (Asphalt), Trenching Machines (Telephies-Vermeer Concrete Saw), Tractor Type Demolition Equipment, Vacuum Truck. Vibratory Roller(Riding) or Roller used in mainline paving operations.

GROUP I-B: Asphalt Mobile Conveyor/Transfer Machine, Road Paver (Asphalt).

GROUP II-A: Ballast Regulators, Compactor Self Propelled, Fusion Machine, Rail Anchor Machines, Roller (4 ton and over), Scrapers (20 yard struck and under).

GROUP II-B: Mechanic (Outside) All Types, Shop Mechanic.

GROUP III: Air Tractor Drill, Asphalt Plant, Batch Plant, Boiler (High Pressure), Concrete Breaker (Track or Rubber Tire), Concrete Pump, Concrete Spreader, Excavator Drill, Farm Tractor, Forklift (all types), Gas Tapping (Live), Hydroseeder, Loader (1 1/2 yards and under), Locomotive (all sizes), Machine Pulling Sheeps Foot Roller, Portable Asphalt Plant, Portable Batch Plant, Portable Crusher (Apprentice), Powerhouse Plant, Roller (under 4 ton), Sheer Excavator, Skid Steer/Bobcat, Stone Crusher, Sweeper (with seat), Well Drilling Machine.

GROUP IV: Service Person (Grease Truck), Deckhand.

GROUP IV-B: Conveyor Belt Machine (Truck Mounted), Heater (all types), Lighting Unit (Portable), Maintenance Engineer (For Crane Only), Mechanics Helper, Pump (Fireproofing), Pumps-Pump Station/Water/Sewer/Gypsum/Plaster, etc., Pump Truck (Sewer Jet or Similar), Welders Helper, Welding Machine (Steel Erection), Well Point System.

GROUP V: All Tower Cranes-All Climbing Cranes and all cranes of 100-ton capacity or greater (3900 Manitowac or similar) irrespective of manufacturer and regardless of how the same is rigged, Hoist Engineer (Steel), Engineer-Pile Driver, Jersey Spreader, Pavement Breaker/Post Hole Digger.

WAGES: Per hour:	07/01/2021	03/07/2022	03/06/2023
Group I	\$ 64.63	\$ 65.97	\$ 67.27
Group I-A	57.02	58.16	59.26
Group I-B	60.06	61.28	62.46
Group II-A	54.61	55.70	56.74
Group II-B	56.31	57.44	58.52
Group III	53.66	54.72	55.74
Group IV	48.80	49.74	50.63
Group IV-B	41.94	42.71	43.43
Group V			
Engineer All Tower, Climbing and			
Cranes of 100 Tons	73.18	74.73	76.24
Hoist Engineer(Steel)	66.29	67.67	69.01

Engineer(Pile Driver)	70.67	72.16	73.61
Jersey Spreader,Pavement Breaker (Air Ram)Post Hole Digger	55.87	56.99	58.06

SHIFT DIFFERENTIAL:

A 15% premium on all hours paid, including overtime hours for 2nd, 3rd shifts on all government mandated off-shift work

Engineers operating cranes with booms 100 feet but less than 149 feet in length will be paid an additional \$2.00 per hour over the rate listed in the Wage Schedule. Engineers operating cranes with booms 149 feet or over in length will be paid an additional \$3.00 per hour over the rate listed in the Wage Schedule. Loader and Excavator Operators: over 5 cubic yards capacity \$0.50 per hour over the rate listed in the Wage Schedule. Shovel Operators: over 4 cubic yards capacity \$1.00 per hour over the rate listed in the Wage Schedule.

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday; Friday may be used as a make-up day.

NOTE - In order to use the 4 Day/10 Hour Work schedule Registration for Use of 4 Day/10 Hour Work Schedule,form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker:	07/01/2021	03/07/2022	03/06/2023
	\$ 31.60 up to 40 Hours	\$ 32.60 up to 40 hours	\$ 33.75 up to 40 hours
	After 40 hours \$ 22.40* PLUS \$ 1.20 on all hours worked	After 40 hours \$ 23.40* PLUS \$ 1.20 on all hours worked	After 40 hours \$ 24.50* PLUS \$ 1.25 on all hours worked

*This amount is subject to premium

OVERTIME PAY

See (B, E, E2, P, *R, **U) on OVERTIME PAGE

HOLIDAY

Paid:..... See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

Overtime..... See (5, 6, 8, 15, 25, 26) on OVERTIME PAGE

* For Holiday codes 8,15,25,26 code R applies

** For Holiday Codes 5 & 6 code U applies

Note: If employees are required to work on Easter Sunday they shall be paid at the rate of triple time.

REGISTERED APPRENTICES

(1)year terms at the following rate.

	07/01/2021	03/07/2022	03/06/2023
1st term	\$ 28.51	\$ 29.08	\$ 29.63
2nd term	34.21	34.90	35.56
3rd term	39.91	40.71	41.48
4th term	45.61	46.53	47.41
Supplemental Benefits per hour:			
	23.60	24.55	25.70

8-137HH

Operating Engineer - Heavy&Highway

09/01/2021

JOB DESCRIPTION Operating Engineer - Heavy&Highway

DISTRICT 9

ENTIRE COUNTIES

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: South of the North city line of Poughkeepsie

WAGES

Party Chief - One who directs a survey party

Instrument Man - One who runs the instrument and assists Party Chief

Rodman - One who holds the rod and in general, assists the Survey Crew

Catogories cover GPS & Underground Surveying

Per Hour: 07/01/2021

Party Chief \$ 81.72

Instrument Man 61.43
Rodman 52.40

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2021

All Catogories
Straight Time: \$ 25.25* plus \$7.15

Premium:
Time & 1/2 \$ 37.88* plus \$7.15

Double Time \$ 50.50* plus \$7.15

Non-Worked Holiday Supplemental Benefits:
\$ 16.45

OVERTIME PAY

See (B, *E, Q) on OVERTIME PAGE

* Doubletime paid on all hours in excess of 8 hours on Saturday

HOLIDAY

Paid: See (5, 6, 7, 11, 12) on HOLIDAY PAGE
Overtime: See (5, 6, 7, 11, 12) on HOLIDAY PAGE

9-15Dh

Operating Engineer - Heavy&Highway - Tunnel

09/01/2021

JOB DESCRIPTION Operating Engineer - Heavy&Highway - Tunnel

DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: All the counties of Westchester and Putnam and the southern part of Dutchess County defined by the northern boundary line of the City of Poughkeepsie, then due east to Route 115, then north along Route 115 to Bedell Road, then east along Bedell Road to Van Wagner Road, then north along Van Wagner Road to Bower Road, then east along Bower Road to Route 44 and along Route 44 east to Route 343, then along Route 343 east to the northern boundary of Town of Dover Plains and east along the northern boundary of Town of Dover Plains to the border line of the State of Connecticut and bordered on the west by the middle of the Hudson River.

WAGES

GROUP I: Boom Truck, Cherry Picker, Clamshell, Crane(Crawler,Truck), Dragline, Drill Rig Casa Grande(Cat or Similar), Floating Crane(Crane on Barge-Under 100 Tons), Hoist Engineer(Concrete/Crane-Derrick-Mine Hoist), Knuckle Boom Crane, Rough Terrain Crane.

GROUP I-A: Auger(Truck or Truck Mounted), Boat Captain, Bull Dozer-all sizes, Central Mix Plant Operator, Chipper-all types, Close Circuit T.V., Combination Loader/Backhoe, Compactor with Blade, Concrete Finishing Machine, Gradall, Grader(Motor Grader), Elevator & Cage(Materials or Passengers), Excavator(and all attachments), Front End Loaders(1 1/2 yards and over), High Lift Lull, Hoist(Single, Double, Triple Drum), Hoist Portable Mobile Unit, Hoist Engineer(Material), Jack and Bore Machine, Log Skidder, Milling Machine, Moveable Concrete Barrier Transfer & Transport Vehicle, Mucking Machines. Overhead Crane, Paver(Concrete), Post Pounder of any type, Push Cats, Road Reclaimer, Robot Hammer(Brokk or similar), Robotic Equipment(Scope of Engineer Schedule), Ross Carrier and similar machines, Scrapers(20 yards struck and over), Side Boom, Slip Form Machine, Spreader(Asphalt), Trenching Machines, Telephies-Vermeer Concrete Saw, Tractor type demolition equipment, Vacuum Truck, Vibratory Roller (Riding) used in mainline paving operations.

GROUP I-B: Asphalt Mobile Conveyor/Transfer Machine, Road Paver(Asphalt).

GROUP II-A: Ballast Regulators, Compactor(Self-propelled), Fusion Machine, Rail Anchor Machines, Roller(4 ton and over), Scrapers(20 yard struck and under).

GROUP II-B: Mechanic(outside)all types, Shop Mechanic.

GROUP III: Air Tractor Drill, Asphalt Plant, Batch Plant, Boiler(High Pressure), Concrete Breaker(Track or Rubber Tire), Concrete Pump, Concrete Spreader, Excavator Drill, Farm Tractor, Forklift(all types of power), Gas Tapping(Live), Hydroseeder, Loader(1 1/2 yards and under), Locomotive(all sizes), Machine Pulling Sheeps Foot Roller, Portable Asphalt Plant, Portable Batch Plant, Portable Crusher(Apprentice), Powerhouse Plant, Roller(under 4 ton), Sheer Excavator, Skidsteer/Bobcat, Stone Crusher, Sweeper(with seat), Well Drilling Machine.

GROUP IV-A: Service Person(Grease Truck), Deckhand.

GROUP IV-B: Conveyor Belt Machine(Truck Mounted), Heater(all types), Lighting Unit(Portable), Maintenance Engineer(for Crane only), Mechanics Helper, Pump(Fireproofing), Pumps-Pump Station/Water/Sewer/Gypsum/Plaster, etc., Pump Truck(Sewer Jet or similar), Welding Machine(Steel Erection), Welders Helper.

GROUP V-A: Engineer(all Tower Cranes, all Climbing Cranes & all Cranes of 100 ton capacity or greater),Hoist Engineer(Steel-Sub Structure), Engineer-Pile Driver, Jersey-Spreader, Pavement breaker, Post Hole Digger

WAGES: (per hour)

	07/01/2021	03/07/2022	03/06/2023
GROUP I	\$ 64.63	\$ 65.97	\$ 67.27
GROUP I-A	57.02	58.16	59.21
GROUP I-B	60.06	61.28	62.46
GROUP II-A	54.61	55.70	56.74
GROUP II-B	56.31	57.44	58.52
GROUP III	53.66	54.72	55.74
GROUP IV-A	48.80	49.74	50.63
GROUP IV-B	41.94	42.71	43.43
GROUP V-A			
Engineer-Cranes	73.18	74.73	76.24
Engineer-Pile Driver	70.67	72.16	73.61
Hoist Engineer	66.29	67.67	69.01
Jersey Spreader/Post Hole Digger	55.87	56.99	58.06

SHIFT DIFFERENTIAL:

A 15% premium on all hours paid, including overtime hours for 2nd, 3rd shifts
on all government mandated off-shift work

An additional 20% to wage when required to wear protective equipment on hazardous/toxic waste projects. Operators required to use two buckets pouring concrete on other than road pavement shall receive \$0.50 per hour over scale. Engineers operating cranes with booms 100 feet but less than 149 feet in length will be paid an additional \$2.00 per hour. Engineers operating cranes with booms 149 feet or over in length will be paid an additional \$3.00 per hour. Operators of shovels with a capacity over (4) cubic yards shall be paid an additional \$1.00 per hour. Operators of loaders with a capacity over (5) cubic yards shall be paid an additional \$0.50 per hour.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker:

	07/01/2021	03/07/2022	03/06/2023
	\$ 23.60	\$ 24.55	\$ 25.70
	+ \$8.00	+ \$8.00	+ \$8.00
(Limited to first 40 hours)		(Limited to first 40 hours)	(Limited to first 40 hours)

OVERTIME PAY

See (D, O, *U, V) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

* Note: For Holiday codes 5 & 6, code U applies. For Holiday codes 8, 15, 25, 26, code R applies.

Note: If employees are required to work on Easter Sunday, they shall be paid at the rate of triple time.

REGISTERED APPRENTICES

(1)year terms at the following rates:

	07/01/2021	03/07/2022	03/06/2023
1st term	\$ 28.51	\$ 29.08	\$ 29.63
2nd term	34.21	34.90	35.56
3rd term	39.91	40.71	41.48
4th term	45.61	46.53	47.41

Supplemental Benefits per hour:

All terms	\$ 23.60	\$ 24.55	\$ 25.70
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Operating Engineer - Marine Dredging

09/01/2021

JOB DESCRIPTION Operating Engineer - Marine Dredging

DISTRICT 4

ENTIRE COUNTIES

Albany, Bronx, Cayuga, Clinton, Columbia, Dutchess, Essex, Franklin, Greene, Jefferson, Kings, Monroe, Nassau, New York, Orange, Oswego, Putnam, Queens, Rensselaer, Richmond, Rockland, St. Lawrence, Suffolk, Ulster, Washington, Wayne, Westchester

WAGES

These wages do not apply to Operating Engineers on land based construction projects. For those projects, please see the Operating Engineer Heavy/Highway Rates. The wage rates below for all equipment and operators are only for marine dredging work in navigable waters found in the counties listed above.

Per Hour:	07/01/2021	10/01/2021
CLASS A1 Deck Captain, Leverman Mechanical Dredge Operator Licensed Tug Operator 1000HP or more.	\$ 41.42	\$ 41.42
CLASS A2 Crane Operator (360 swing)	36.91	36.91
CLASS B Dozer, Front Loader Operator on Land	To conform to Operating Engineer Prevailing Wage in locality where work is being performed including benefits.	
CLASS B1 Derrick Operator (180 swing) Spider/Spill Barge Operator Operator II, Fill Placer, Engineer, Chief Mate, Electrician, Chief Welder, Maintenance Engineer Licensed Boat, Crew Boat Operator	35.82	35.82
CLASS B2 Certified Welder	33.72	33.72
CLASS C1 Drag Barge Operator, Steward, Mate, Assistant Fill Placer	32.80	32.80
CLASS C2 Boat Operator	30.89	31.74
CLASS D Shoreman, Deckhand, Oiler, Rodman, Scowman, Cook, Messman, Porter/Janitor	25.66	26.37

SUPPLEMENTAL BENEFITS

Per Hour:

THE FOLLOWING SUPPLEMENTAL BENEFITS APPLY TO ALL CATEGORIES

All Classes A & B	07/01/2021 \$11.98 plus 8% of straight time wage, Overtime hours add \$ 0.63	10/01/2021 \$11.98 plus 8% of straight time wage, Overtime hours add \$ 0.63
All Class C	\$11.68 plus 8% of straight time wage, Overtime hours add \$ 0.48	11.68 plus 8% of straight time wage, Overtime hours add \$ 0.48
All Class D	\$11.38 plus 8%	11.38 plus 8%

of straight time
wage, Overtime hours
add \$ 0.33

of straight time
wage, Overtime hours
add \$ 0.33

OVERTIME PAY

See (B2, F, R) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 15, 26) on HOLIDAY PAGE

4-25a-MarDredge

Operating Engineer - Survey Crew - Consulting Engineer

09/01/2021

JOB DESCRIPTION Operating Engineer - Survey Crew - Consulting Engineer

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Suffolk, Westchester

PARTIAL COUNTIES

Dutchess: That part in Dutchess County lying South of the North City line of Poughkeepsie.

WAGES

Feasibility and preliminary design surveying, any line and grade surveying for inspection or supervision of construction.

Per hour: 07/01/2021
Survey Classifications

Party Chief \$ 45.83
Instrument Man 38.17
Rodman 33.34

SUPPLEMENTAL BENEFITS

Per Hour:

All Crew Members: \$ 20.60

OVERTIME PAY

OVERTIME:.... See (B, E*, Q, V) ON OVERTIME PAGE.

*Doubletime paid on the 9th hour on Saturday.

HOLIDAY

Paid: See (5, 6, 7, 11, 16) on HOLIDAY PAGE
Overtime: See (5, 6, 7, 11, 16) on HOLIDAY PAGE

9-15dconsult

Painter

09/01/2021

JOB DESCRIPTION Painter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour: 07/01/2021

Brush \$ 50.30*

Abatement/Removal of lead based
or lead containing paint on
materials to be repainted. 50.30*

Spray & Scaffold \$ 53.30*
Fire Escape 53.30*
Decorator 53.30*
Paperhanger/Wall Coverer 52.93*

*Subtract \$ 0.10 to calculate premium rate.

SUPPLEMENTAL BENEFITS

Per hour: 07/01/2021

Paperhanger \$ 31.83
All others 29.81
Premium 33.40**

**Applies only to "All others" category, not paperhanger journeyworker.

OVERTIME PAY

See (A, H) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

One (1) year terms at the following wage rate.

Per hour:	07/01/2021
Appr 1st term...	\$ 19.56*
Appr 2nd term...	25.12*
Appr 3rd term...	30.42*
Appr 4th term...	40.65*

*Subtract \$ 0.10 to calculate premium rate.

Supplemental benefits:

Per Hour:	07/01/2021
Appr 1st term...	\$ 14.72
Appr 2nd term...	18.23
Appr 3rd term...	21.06
Appr 4th term...	26.67

8-NYDC9-B/S

Painter

09/01/2021

JOB DESCRIPTION Painter

DISTRICT 8

ENTIRE COUNTIES

Putnam, Suffolk, Westchester

PARTIAL COUNTIES

Nassau: All of Nassau except the areas described below: Atlantic Beach, Ceadhurst, East Rockaway, Gibson, Hewlett, Hewlett Bay, Hewlett Neck, Hewlett Park, Inwood, Lawrence, Lido Beach, Long Beach, parts of Lynbrook, parts of Oceanside, parts of Valley Stream, and Woodmere. Starting on the South side of Sunrise Hwy in Valley Stream running east to Windsor and Rockaway Ave., Rockville Centre is the boundary line up to Lawson Blvd. turn right going west all the above territory. Starting at Union Turnpike and Lakeville Rd. going north to Northern Blvd. the west side of Lakeville road to Northern blvd. At Northern blvd. going east the district north of Northern blvd. to Port Washington Blvd. West of Port Washington blvd. to St. Francis Hospital then north of first traffic light to Port Washington and Sands Point, Manor HAVen, Harbour Acres.

WAGES

Per hour:	07/01/2021
Drywall Taper	\$ 50.30*

*Subtract \$ 0.10 to calculate premium rate.

SUPPLEMENTAL BENEFITS

Per hour:	07/01/2021
Journeyman	\$ 29.81

OVERTIME PAY

See (A, H) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages - Per Hour:	07/01/2021
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1500 hour terms at the following wage rate:

1st term	\$ 19.56*
2nd term	25.12*
3rd term	30.42*
4th term	40.65*

*Subtract \$ 0.10 to calculate premium rate.

Supplemental Benefits - Per hour:

One year term (1500 hours) at the following dollar amount.

1st year	\$ 14.72
2nd year	18.23
3rd year	21.06
4th year	26.67

8-NYDCT9-DWT

Painter - Bridge & Structural Steel

09/01/2021

JOB DESCRIPTION Painter - Bridge & Structural Steel

DISTRICT 8

ENTIRE COUNTIES

Albany, Bronx, Clinton, Columbia, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Kings, Montgomery, Nassau, New York, Orange, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington, Westchester

WAGES

Per Hour:

STEEL:

Bridge Painting:	07/01/2021	10/01/2021
	\$ 51.50	\$ 53.00
	+ 8.63*	+ 9.63*

ADDITIONAL \$6.00 per hour for POWER TOOL/SPRAY, whether straight time or overtime.

NOTE: All premium wages are to be calculated on base rate per hour only.

* For the period of May 1st to November 15th, this amount is payable up to 40 hours. For the period of Nov 16th to April 30th, this amount is payable up to 50 hours. EXCEPTION: First and last week of employment, and for the weeks of Memorial Day, Independence Day and Labor Day, where the amount is paid for the actual number of hours worked (no cap).

NOTE: Generally, for Bridge Painting Contracts, ALL WORKERS on and off the bridge (including Flagmen) are to be paid Painter's Rate; the contract must be ONLY for Bridge Painting.

SHIFT WORK:

When directly specified in public agency or authority contract documents for an employer to work a second shift and works the second shift with employees other than from the first shift, all employees who work the second shift will be paid 10% of the base wage shift differential in lieu of overtime for the first eight (8) hours worked after which the employees shall be paid at time and one half of the regular wage rate. When a single irregular work shift is mandated in the job specifications or by the contracting agency, wages shall be paid at time and one half for single shifts between the hours of 3pm-11pm or 11pm-7am.

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker:	07/01/2021	10/01/2021
	\$ 10.90	\$ 10.90
	+ 30.00*	+ 30.60*

* For the period of May 1st to November 15th, this amount is payable up to 40 hours. For the period of Nov 16th to April 30th, this amount is payable up to 50 hours. EXCEPTION: First and last week of employment, and for the weeks of Memorial Day, Independence Day and Labor Day, where the amount is paid for the actual number of hours worked (no cap).

OVERTIME PAY

See (B, F, R) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (4, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage - Per hour:

Apprentices: (1) year terms	07/01/2021	10/01/2021
1st year	\$ 20.60	\$ 21.20
	+ 3.45*	+ 3.86*
2nd year	\$ 30.90	\$ 31.80
	+ 5.18*	+ 5.78*

3rd year	\$ 41.20 + 6.90*	\$ 42.40 + 7.70*
Supplemental Benefits - Per hour:		
1st year	\$.25 + 12.00*	\$.25 + 12.24*
2nd year	\$ 10.90 + 18.00*	\$ 10.90 + 18.36*
3rd year	\$ 10.20 + 24.00*	\$ 10.90 + 24.48*

NOTE: All premium wages are to be calculated on base rate per hour only.

8-DC-9/806/155-BrSS

Painter - Line Striping

09/01/2021

JOB DESCRIPTION Painter - Line Striping

DISTRICT 8

ENTIRE COUNTIES

Albany, Bronx, Clinton, Columbia, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Kings, Montgomery, Nassau, New York, Orange, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington, Westchester

WAGES

Per hour:

Painter (Striping-Highway):	07/01/2021	07/01/2022
Striping-Machine Operator*	\$ 30.32	\$ 31.53
Linerman Thermoplastic	36.93	38.34

Note: * Includes but is not limited to: Positioning of cones and directing of traffic using hand held devices. Excludes the Driver/Operator of equipment used in the maintenance and protection of traffic safety.

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day.

NOTE - In order to use the '4 Day/10 Hour Work Schedule,' as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour paid:	07/01/2021	07/01/2022
Journeyworker:		
Striping Machine Operator:	\$ 10.03	\$ 10.03
Linerman Thermoplastic:	10.03	10.03

OVERTIME PAY

See (B, B2, E2, F, S) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 20) on HOLIDAY PAGE
Overtime: See (5, 20) on HOLIDAY PAGE

REGISTERED APPRENTICES

One (1) year terms at the following wage rates:

	07/01/2021	07/01/2022
1st Term:	\$ 12.50	\$ 12.61
2nd Term:	18.19	18.92
3rd Term:	24.26	25.22

Supplemental Benefits per hour:

1st term:	\$ 9.16	\$ 10.03
2nd Term:	9.16	10.03
3rd Term:	9.16	10.03

8-1456-LS

Painter - Metal Polisher**09/01/2021**

JOB DESCRIPTION Painter - Metal Polisher**DISTRICT 8****ENTIRE COUNTIES**

Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuylar, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

	07/01/2021
Metal Polisher	\$ 37.13
Metal Polisher*	38.23
Metal Polisher**	41.13

*Note: Applies on New Construction & complete renovation

** Note: Applies when working on scaffolds over 34 feet.

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2021

Journeyworker:

All classification \$ 10.64

OVERTIME PAY

See (B, E, P, T) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE

Overtime: See (5, 6, 9, 11, 15, 16, 25, 26) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One (1) year term at the following wage rates:

	07/01/2021
1st year	\$ 16.00
2nd year	17.00
3rd year	18.00
1st year*	\$ 16.39
2nd year*	17.44
3rd year*	18.54
1st year**	\$ 18.50
2nd year**	19.50
3rd year**	20.50

*Note: Applies on New Construction & complete renovation

** Note: Applies when working on scaffolds over 34 feet.

Supplemental benefits:

Per hour:

1st year	\$ 7.39
2nd year	7.39
3rd year	7.39

8-8A/28A-MP

Plumber**09/01/2021**

JOB DESCRIPTION Plumber**DISTRICT 8****ENTIRE COUNTIES**

Putnam, Westchester

WAGES

Per hour:

	07/01/2021
Plumber and Steamfitter	\$ 59.01

SHIFT WORK:

When directly specified in public agency or authority contract documents, shift work outside the regular hours of work shall be comprised of eight (8) hours per shift not including Saturday, Sundays and holidays. One half (1/2) hour shall be allowed for lunch after the first four (4) hours of each shift. Wage and Fringes for shift work shall be straight time plus a shift premium of twenty-five (25%) percent. A minimum of five days Monday through Friday must be worked to establish shift work.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker \$ 39.26

OVERTIME PAY

See (B, E, E2, Q, V) on OVERTIME PAGE

OVERTIME:.... See on OVERTIME PAGE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1)year terms at the following wages:

1st Term	\$ 21.89
2nd Term	25.13
3rd Term	29.01
4th Term	41.43
5th Term	44.45

Supplemental Benefits per hour:

1st term	\$ 16.25
2nd term	18.13
3rd term	21.57
4th term	28.41
5th term	30.11

8-21.1-ST

Plumber - HVAC / Service

09/01/2021

JOB DESCRIPTION Plumber - HVAC / Service

DISTRICT 8

ENTIRE COUNTIES

Dutchess, Putnam, Westchester

PARTIAL COUNTIES

Delaware: Only the townships of Middletown and Roxbury

Ulster: Entire County(including Wallkill and Shawangunk Prisons) except for remainder of Town of Shawangunk and Towns of Plattekill, Marlboro, and Wawarsing.

WAGES

Per hour: 07/01/2021

HVAC Service \$ 40.68
+ \$ 4.32*

*Note: This portion of wage is not subject to overtime premium.

SUPPLEMENTAL BENEFITS

Per hour:

07/01/2021

Journeyworker HVAC Service

\$ 26.54

OVERTIME PAY

See (B, F, R) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 16, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

HVAC SERVICE

(1) year terms at the following wages:

1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.
\$ 18.50	\$ 21.88	\$ 27.31	\$ 33.56	\$ 36.36
+\$2.37*	+\$2.67*	+\$3.22*	+\$3.84*	+\$4.07*

*Note: This portion of wage is not subject to overtime premium.

Supplemental Benefits per hour:

Apprentices	07/01/2021
1st term	\$ 19.66
2nd term	20.86
3rd term	22.21
4th term	24.02
5th term	25.33

8-21.1&2-SF/Re/AC

Plumber - Jobbing & Alterations

09/01/2021

JOB DESCRIPTION Plumber - Jobbing & Alterations

DISTRICT 8

ENTIRE COUNTIES

Dutchess, Putnam, Westchester

PARTIAL COUNTIES

Ulster: Entire county (including Wallkill and Shawangunk Prisons in Town of Shawangunk) EXCEPT for remainder of Town of Shawangunk, and Towns of Plattekill, Marlboro, and Wawarsing.

WAGES

Per hour:	07/01/2021
Journeyworker:	\$ 45.83

Repairs, replacements and alteration work is any repair or replacement of a present plumbing system that does not change existing roughing or water supply lines.

SHIFT WORK:

When directly specified in public agency or authority contract documents, shift work outside the regular hours of work shall be comprised of eight (8) hours per shift not including Saturday, Sundays and holidays. One half (1/2) hour shall be allowed for lunch after the first four (4) hours of each shift. Wage and Fringes for shift work shall be straight time plus a shift premium of twenty-five (25%) percent. A minimum of five days Monday through Friday must be worked to establish shift work.

SUPPLEMENTAL BENEFITS

Per hour:
Journeyworker

\$ 32.96

OVERTIME PAY

See (B, *E, E2, Q, V) on OVERTIME PAGE

*When used as a make-up day, hours after 8 on Saturday shall be paid at time and one half.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1) year terms at the following wages:

1st year	\$ 19.88
2nd year	22.06
3rd year	23.90
4th year	33.57
5th year	35.46

Supplemental Benefits per hour:

1st year	\$ 10.74
2nd year	12.65
3rd year	16.58
4th year	22.39
5th year	24.32

Roofer

09/01/2021

JOB DESCRIPTION Roofer

DISTRICT 9

ENTIRE COUNTIES

Bronx, Dutchess, Kings, New York, Orange, Putnam, Queens, Richmond, Rockland, Sullivan, Ulster, Westchester

WAGES

Per Hour: 07/01/2021

Roofer/Waterproofer \$ 45.25
+ \$7.00*

* This portion is not subjected to overtime premiums.

Note: Abatement/Removal of Asbestos containing roofs and roofing material is classified as Roofer.

SUPPLEMENTAL BENEFITS

Per Hour: \$ 28.62

OVERTIME PAY

See (B, H) on OVERTIME PAGE

Note: An observed holiday that falls on a Sunday will be observed the following Monday.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1) year term

1st	2nd	3rd	4th
\$ 15.84	\$ 22.63	\$ 27.15	\$ 33.94
	+ 3.50*	+ 4.20*	+ 5.26*

Supplements:

1st	2nd	3rd	4th
\$ 3.72	\$ 14.47	\$ 17.30	\$ 21.55

9-8R

Sheetmetal Worker

09/01/2021

JOB DESCRIPTION Sheetmetal Worker

DISTRICT 8

ENTIRE COUNTIES

Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester

WAGES

07/01/2021
SheetMetal Worker \$ 44.15
+ 3.37*

*This portion is not subject to overtime premiums.

SHIFT WORK

For all NYS D.O.T. and other Governmental mandated off-shift work:

10% increase for additional shifts for a minimum of five (5) days

SUPPLEMENTAL BENEFITS

Journeyworker \$ 44.20

OVERTIME PAY

OVERTIME:.. See (B, E, Q,) on OVERTIME PAGE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 15, 16, 23) on HOLIDAY PAGE

REGISTERED APPRENTICES

1st	2nd	3rd	4th	5th	6th	7th	8th
\$ 16.36	\$ 18.41	\$ 20.46	\$ 22.51	\$ 24.54	\$ 26.60	\$ 29.12	\$ 31.65
+ 1.35*	+ 1.52*	+ 1.69*	+ 1.85*	+ 2.02*	+ 2.19*	+ 2.36*	+ 2.53*

*This portion is not subject to overtime premiums.

Supplemental Benefits per hour:

Apprentices	
1st term	\$ 18.96
2nd term	21.34
3rd term	23.71
4th term	26.11
5th term	28.46
6th term	30.82
7th term	32.72
8th term	34.64

8-38

Sheetmetal Worker	09/01/2021
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JOB DESCRIPTION Sheetmetal Worker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per Hour:	07/01/2021	8/01/2021
Sign Erector	\$ 52.29	\$ 53.97

NOTE: Structurally Supported Overhead Highway Signs(See STRUCTURAL IRON WORKER CLASS)

SUPPLEMENTAL BENEFITS

Per Hour:	07/01/2021	8/01/2021
Sign Erector	\$ 51.26	\$ 53.15

OVERTIME PAY

See (A, F, S) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 10, 11, 12, 16, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 10, 11, 12, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Per Hour:
6 month Terms at the following percentage of Sign Erectors wage rate:

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
35%	40%	45%	50%	55%	60%	65%	70%	75%	80%

SUPPLEMENTAL BENEFITS

Per Hour:									
07/01/2021									
1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 14.34	\$ 16.26	\$ 18.17	\$ 20.10	\$ 28.02	\$ 30.47	\$ 33.72	\$ 36.27	\$ 38.77	\$ 41.29
8/01/2021									
1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ TBD	\$ TBD	\$ TBD	\$ TBD	\$ TBD	\$ TBD	\$ TBD	\$ TBD	\$ TBD	\$ TBD

4-137-SE

Sprinkler Fitter	09/01/2021
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JOB DESCRIPTION Sprinkler Fitter

DISTRICT 1

ENTIRE COUNTIES

Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester

WAGES

Per hour	07/01/2021
Sprinkler Fitter	\$ 47.19

SUPPLEMENTAL BENEFITS

Per hour	
Journey person	\$ 28.09

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

Note: When a holiday falls on Sunday, the following Monday shall be considered a holiday and all work performed on either day shall be at the double time rate. When a holiday falls on Saturday, the preceding Friday shall be considered a holiday and all work performed on either day shall be at the double time rate.

REGISTERED APPRENTICES

Wages per hour

One Half Year terms at the following wage.

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 22.67	\$ 25.19	\$ 27.46	\$ 29.98	\$ 32.50	\$ 35.02	\$ 37.54	\$ 40.05	\$ 42.57	\$ 45.09

Supplemental Benefits per hour

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 8.27	\$ 8.27	\$ 19.22	\$ 19.22	\$ 19.47	\$ 19.47	\$ 19.47	\$ 19.47	\$ 19.47	\$ 19.47
									1-669.2

Teamster - Building / Heavy&Highway

09/01/2021

JOB DESCRIPTION Teamster - Building / Heavy&Highway

DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

WAGES

GROUP A: Straight Trucks (6-wheeler and 10-wheeler), A-frame, Winch, Dynamite Seeding, Mulching, Agitator, Water, Attenuator, Light Towers, Cement (all types), Suburban, Station Wagons, Cars, Pick Ups, any vehicle carrying materials of any kind.

GROUP AA: Tack Coat

GROUP B: Tractor & Trailers (all types).

GROUP BB: Tri-Axle, 14 Wheeler

GROUP C: Low Boy (carrying equipment).

GROUP D: Fuel Trucks, Tire Trucks.

GROUP E: Off-road Equipment (over 40 tons): Athey Wagons, Belly Dumps, Articulated Dumps, Trailer Wagons.

GROUP F: Off-road Equipment (over 40 tons) Euclid, DJB.

GROUP G: Off-road Equipment (under 40 tons) Athey Wagons, Belly Articulated Dumps, Trailer Wagons.

GROUP H: Off-road Equipment (under 40 tons), Euclid.

GROUP HH: Off-road Equipment (under 40 tons) D.J.B.

GROUP I: Off-road Equipment (under 40 tons) Darts.

GROUP II: Off-road Equipment (under 40 tons) RXS.

WAGES:(per hour)

07/01/2021

GROUP A	\$ 42.47*
GROUP AA	45.27*
GROUP B	43.09*
GROUP BB	42.59*
GROUP C	45.22*
GROUP D	42.92*
GROUP E	43.47*
GROUP F	44.47*
GROUP G	43.22*
GROUP H	43.84*
GROUP HH	44.22*
GROUP I	43.97*
GROUP II	44.34*

* To calculate premium wage, subtract \$.20 from the hourly wage.

Note: Fuel truck operators on construction sites addit. \$5.00 per day.

For work on hazardous/toxic waste site addit. 20% of hourly rate.

Shift Differential: NYS DOT or other Governmental Agency contracts shall receive a shift differential of Fifteen(15%)percent above the wage rate

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker

First 40 hours	\$ 33.64
41st-45th hours	15.18
Over 45 hours	0.26

OVERTIME PAY

See (B, E, P, R) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 8, 9, 15, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 9, 15, 25) on HOLIDAY PAGE

8-456

Welder

09/01/2021

JOB DESCRIPTION Welder

DISTRICT 1

ENTIRE COUNTIES

Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

Per hour 07/01/2021

Welder: To be paid the same rate of the mechanic performing the work.*

*EXCEPTION: If a specific welder certification is required, then the 'Certified Welder' rate in that trade tag will be paid.

OVERTIME PAY

HOLIDAY

1-As Per Trade

Overtime Codes

Following is an explanation of the code(s) listed in the OVERTIME section of each classification contained in the attached schedule. Additional requirements may also be listed in the HOLIDAY section.

NOTE: Supplemental Benefits are 'Per hour worked' (for each hour worked) unless otherwise noted

- (AA) Time and one half of the hourly rate after 7 and one half hours per day
- (A) Time and one half of the hourly rate after 7 hours per day
- (B) Time and one half of the hourly rate after 8 hours per day
- (B1) Time and one half of the hourly rate for the 9th & 10th hours week days and the 1st 8 hours on Saturday.
Double the hourly rate for all additional hours
- (B2) Time and one half of the hourly rate after 40 hours per week
- (C) Double the hourly rate after 7 hours per day
- (C1) Double the hourly rate after 7 and one half hours per day
- (D) Double the hourly rate after 8 hours per day
- (D1) Double the hourly rate after 9 hours per day
- (E) Time and one half of the hourly rate on Saturday
- (E1) Time and one half 1st 4 hours on Saturday; Double the hourly rate all additional Saturday hours
- (E2) Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
- (E3) Between November 1st and March 3rd Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather, provided a given employee has worked between 16 and 32 hours that week
- (E4) Saturday and Sunday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
- (E5) Double time after 8 hours on Saturdays
- (F) Time and one half of the hourly rate on Saturday and Sunday
- (G) Time and one half of the hourly rate on Saturday and Holidays
- (H) Time and one half of the hourly rate on Saturday, Sunday, and Holidays
- (I) Time and one half of the hourly rate on Sunday
- (J) Time and one half of the hourly rate on Sunday and Holidays
- (K) Time and one half of the hourly rate on Holidays
- (L) Double the hourly rate on Saturday
- (M) Double the hourly rate on Saturday and Sunday
- (N) Double the hourly rate on Saturday and Holidays
- (O) Double the hourly rate on Saturday, Sunday, and Holidays
- (P) Double the hourly rate on Sunday
- (Q) Double the hourly rate on Sunday and Holidays
- (R) Double the hourly rate on Holidays
- (S) Two and one half times the hourly rate for Holidays

- (S1) Two and one half times the hourly rate the first 8 hours on Sunday or Holidays One and one half times the hourly rate all additional hours.
- (T) Triple the hourly rate for Holidays
- (U) Four times the hourly rate for Holidays
- (V) Including benefits at SAME PREMIUM as shown for overtime
- (W) Time and one half for benefits on all overtime hours.
- (X) Benefits payable on Paid Holiday at straight time. If worked, additional benefit amount will be required for worked hours. (Refer to other codes listed.)

Holiday Codes

PAID Holidays:

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

OVERTIME Holiday Pay:

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays. The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Following is an explanation of the code(s) listed in the HOLIDAY section of each classification contained in the attached schedule. The Holidays as listed below are to be paid at the wage rates at which the employee is normally classified.

- (1) None
- (2) Labor Day
- (3) Memorial Day and Labor Day
- (4) Memorial Day and July 4th
- (5) Memorial Day, July 4th, and Labor Day
- (6) New Year's, Thanksgiving, and Christmas
- (7) Lincoln's Birthday, Washington's Birthday, and Veterans Day
- (8) Good Friday
- (9) Lincoln's Birthday
- (10) Washington's Birthday
- (11) Columbus Day
- (12) Election Day
- (13) Presidential Election Day
- (14) 1/2 Day on Presidential Election Day
- (15) Veterans Day
- (16) Day after Thanksgiving
- (17) July 4th
- (18) 1/2 Day before Christmas
- (19) 1/2 Day before New Years
- (20) Thanksgiving
- (21) New Year's Day
- (22) Christmas
- (23) Day before Christmas
- (24) Day before New Year's
- (25) Presidents' Day
- (26) Martin Luther King, Jr. Day
- (27) Memorial Day
- (28) Easter Sunday

(29) Juneteenth



New York State Department of Labor - Bureau of Public Work
State Office Building Campus
Building 12 - Room 130
Albany, New York 12240

REQUEST FOR WAGE AND SUPPLEMENT INFORMATION

As Required by Articles 8 and 9 of the NYS Labor Law

Fax (518) 485-1870 or mail this form for new schedules or for determination for additional occupations.

This Form Must Be Typed

Submitted By:

(Check Only One)

☐

Contracting Agency

☐

Architect or Engineering Firm

☐

Public Work District Office

Date:

A. Public Work Contract to be let by: (Enter Data Pertaining to Contracting/Public Agency)

1. Name and complete address ☐ (Check if new or change)

Telephone: ()

Fax: ()

E-Mail:

2. NY State Units (see Item 5)

☐ 01 DOT

☐ 02 OGS

☐ 03 Dormitory Authority

☐ 04 State University
Construction Fund

☐ 05 Mental Hygiene
Facilities Corp.

☐ 06 OTHER N.Y. STATE UNIT

☐ 07 City

☐ 08 Local School District

☐ 09 Special Local District, i.e.,
Fire, Sewer, Water District

☐ 10 Village

☐ 11 Town

☐ 12 County

☐ 13 Other Non-N.Y. State
(Describe)

3. SEND REPLY TO ☐ (check if new or change)
Name and complete address:

Telephone:()

Fax: ()

E-Mail:

4. SERVICE REQUIRED. Check appropriate box and provide project information.

☐ New Schedule of Wages and Supplements.

APPROXIMATE BID DATE :

☐ Additional Occupation and/or Redetermination

PRC NUMBER ISSUED PREVIOUSLY FOR
THIS PROJECT :

OFFICE USE ONLY

B. PROJECT PARTICULARS

5. Project Title _____

Description of Work _____

Contract Identification Number _____

Note: For NYS units, the OSC Contract No. _____

6. Location of Project:
Location on Site _____

Route No/Street Address _____

Village or City _____

Town _____

County _____

7. Nature of Project - Check One:

- ☐ 1. New Building
- ☐ 2. Addition to Existing Structure
- ☐ 3. Heavy and Highway Construction (New and Repair)
- ☐ 4. New Sewer or Waterline
- ☐ 5. Other New Construction (Explain)
- ☐ 6. Other Reconstruction, Maintenance, Repair or Alteration
- ☐ 7. Demolition
- ☐ 8. Building Service Contract

8. OCCUPATION FOR PROJECT :

- ☐ Construction (Building, Heavy Highway/Sewer/Water)
- ☐ Tunnel
- ☐ Residential
- ☐ Landscape Maintenance
- ☐ Elevator maintenance
- ☐ Exterminators, Fumigators
- ☐ Fire Safety Director, NYC Only
- ☐ Guards, Watchmen
- ☐ Janitors, Porters, Cleaners, Elevator Operators
- ☐ Moving furniture and equipment
- ☐ Trash and refuse removal
- ☐ Window cleaners
- ☐ Other (Describe)

9. Has this project been reviewed for compliance with the Wicks Law involving separate bidding?

YES ☐ NO ☐

10. Name and Title of Requester

Signature



NEW YORK STATE DEPARTMENT OF LABOR
Bureau of Public Work - Debarment List

**LIST OF EMPLOYERS INELIGIBLE TO BID ON OR BE
AWARDED ANY PUBLIC WORK CONTRACT**

Under Article 8 and Article 9 of the NYS Labor Law, a contractor, sub-contractor and/or its successor shall be debarred and ineligible to submit a bid on or be awarded any public work or public building service contract/sub-contract with the state, any municipal corporation or public body for a period of five (5) years from the date of debarment when:

- Two (2) final determinations have been rendered within any consecutive six-year (6) period determining that such contractor, sub-contractor and/or its successor has WILLFULLY failed to pay the prevailing wage and/or supplements;
- One (1) final determination involves falsification of payroll records or the kickback of wages and/or supplements.

The agency issuing the determination and providing the information, is denoted under the heading 'Fiscal Officer'. DOL = New York State Department of Labor; NYC = New York City Comptroller's Office; AG = New York State Attorney General's Office; DA = County District Attorney's Office.

Debarment Database: To search for contractors, sub-contractors and/or their successors debarred from bidding or being awarded any public work contract or subcontract under NYS Labor Law Articles 8 and 9, or under NYS Workers' Compensation Law Section 141-b, access the database at this link: <https://applications.labor.ny.gov/EDList/searchPage.do>

For inquiries where WCB is listed as the "Agency", please call 1-866-546-9322

NYSDOL Bureau of Public Work Debarment List 08/27/2021

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AGENCY	Fiscal Officer	FEIN	EMPLOYER NAME	EMPLOYER DBA NAME	ADDRESS	DEBARMENT START DATE	DEBARMENT END DATE
DOL	NYC	*****9839	A.J.S. PROJECT MANAGEMENT, INC.		149 FIFTH AVENUE NEW YORK NY 10010	12/29/2016	12/29/2021
DOL	DOL	*****4018	ADIRONDACK BUILDING RESTORATION INC.		4156 WILSON ROAD EAST TABERG NY 13471	03/26/2019	03/26/2024
DOL	AG	*****1812	ADVANCED BUILDERS & LAND DEVELOPMENT, INC.		400 OSER AVE #2300HAUPPAUGE NY 11788	09/11/2019	09/11/2024
DOL	DOL	*****1687	ADVANCED SAFETY SPRINKLER INC		261 MILL ROAD P.O BOX 296EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	NYC	*****6775	ADVENTURE MASONRY CORP.		1535 RICHMOND AVENUE STATEN ISLAND NY 10314	12/13/2017	12/13/2022
DOL	NYC		AGOSTINHO TOME		405 BARRETTO ST BRONX NY 10474	05/31/2018	05/31/2023
DOL	NYC		AMJAD NAZIR		2366 61ST ST BROOKLYN NY 11204	12/15/2016	12/15/2021
DOL	NYC		AMJED PARVEZ		401 HANOVER AVENUE STATEN ISLAND NY 10304	01/11/2021	01/11/2026
DOL	DOL		ANGELO F COKER		2610 SOUTH SALINA STREET SUITE 14SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL		ANGELO F COKER		2610 SOUTH SALINA STREET SUITE 14SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	DOL		ANITA SALERNO		158 SOLAR ST SYRACUSE NY 13204	01/07/2019	01/07/2024
DOL	NYC		ANTHONY J SCLAFANI		149 FIFTH AVE NEW YORK NY 10010	12/29/2016	12/29/2021
DOL	DOL		ANTHONY PERGOLA		3 WEST MAIN ST/SUITE 208 ELMSFORD NY 10323	01/23/2017	01/23/2022
DOL	DOL		ANTONIO ESTIVEZ		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		ARNOLD A. PAOLINI		1250 BROADWAY ST BUFFALO NY 14212	02/03/2020	02/03/2025
DOL	NYC		ARSHAD MEHMOOD		168-42 88TH AVENUE JAMAICA NY 11432	11/20/2019	11/20/2024
DOL	DOL		ARVINDER ATWAL		65 KENNETH PLACE NEW HYDE PARK NY 11040	07/19/2017	07/19/2022
DOL	NYC	*****6683	ATLAS RESTORATION CORP.		35-12 19TH AVENUE ASTORIA NY 11105	08/02/2017	08/02/2022
DOL	NYC	*****5532	ATWAL MECHANICALS, INC		65 KENNETH PLACE NEW HYDE PARK NY 11040	07/19/2017	07/19/2022
DOL	NYC	*****2591	AVI 212 INC.		260 CROSEY AVENUE APT 11GBROOKLYN NY 11214	10/30/2018	10/30/2023
DOL	NYC		AZIDABEGUM		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	NYC		BALWINDER SINGH		421 HUDSON ST SUITE C5NEW YORK NY 10014	02/20/2019	02/20/2024
DOL	NYC	*****8416	BEAM CONSTRUCTION, INC.		50 MAIN ST WHITE PLAINS NY 10606	01/04/2019	01/04/2024
DOL	NYC	*****2113	BHW CONTRACTING, INC.		401 HANOVER AVENUE STATEN ISLAND NY 10304	01/11/2021	01/11/2026
DOL	DOL		BIAGIO CANTISANI			06/12/2018	06/12/2023
DOL	DOL	*****4512	BOB BRUNO EXCAVATING, INC		5 MORNINGSIDE DR AUBURN NY 13021	05/28/2019	05/28/2024
DOL	DOL		BOGDAN MARKOVSKI		370 W. PLEASANTVIEW AVE SUITE 2.329HACKENSACK NJ 07601	02/11/2019	02/11/2024
DOL	DOL		BRADLEY J SCHUKA		4 BROTHERS ROAD WAPPINGERS FALLS NY 12590	10/20/2020	10/20/2025
DOL	DOL	*****1449	BRRESTORATION NY INC		140 ARCADIA AVENUE OSWEGO NY 13126	09/12/2016	09/12/2021
DOL	DOL		BRUCE P. NASH JR.		5841 BUTTERNUT ROAD EAST SYRACUSE NY 13057	09/12/2018	09/12/2023
DOL	DOL	*****0225	C&D LAFACE CONSTRUCTION, INC.		8531 OSWEGO RD BALDWINVILLE NY 13027	02/03/2020	01/09/2023
DOL	DOL	*****8809	C.B.E. CONTRACTING CORPORATION		310 MCGUINNESS BLVD GREENPOINT NY 11222	03/07/2017	03/07/2022
DOL	DOL	*****9383	C.C. PAVING AND EXCAVATING, INC.		2610 SOUTH SALINA ST SUITE 12SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL	*****9383	C.C. PAVING AND EXCAVATING, INC.		2610 SOUTH SALINA ST SUITE 12SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	DOL	*****5161	CALADRI DEVELOPMENT CORP.		1223 PARK ST. PEEKSKILL NY 10566	05/17/2021	05/17/2026

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DOL	DOL	*****3391	CALI ENTERPRISES, INC.		1223 PARK STREET PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	NYC		CALVIN WALTERS		465 EAST THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	DOL		CANTISANI & ASSOCIATES LTD		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CANTISANI HOLDING LLC			06/12/2018	06/12/2023
DOL	DOL		CARMEN RACHETTA		8531 OSWEGO RD BALDWINVILLE NY 13027	02/03/2020	02/03/2025
DOL	DOL		CARMENA RACHETTA		8531 OSWEGO ROAD BALDWINVILLE NY 13027	02/03/2020	01/09/2023
DOL	DOL	*****3812	CARMODY "2" INC			06/12/2018	06/12/2023
DOL	DOL	*****1143	CARMODY BUILDING CORP	CARMODY CONTRACTIN G AND CARMODY CONTRACTIN G CORP.	442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CARMODY CONCRETE CORPORATION			06/12/2018	06/12/2023
DOL	DOL		CARMODY ENTERPRISES, LTD.		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CARMODY INC		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	*****3812	CARMODY INDUSTRIES INC			06/12/2018	06/12/2023
DOL	DOL		CARMODY MAINTENANCE CORPORATION		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CARMODY MASONRY CORP		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	*****8809	CBE CONTRACTING CORP		142 EAST MARKET STREET LONG BEACH NY 11561	03/07/2017	03/07/2022
DOL	AG		CESAR J. AGUDELO		81-06 34TH AVENUE APT. 6EJACKSON HEIGHTS NY 11372	02/07/2018	02/07/2023
DOL	DOL	*****0026	CHANTICLEER CONSTRUCTION LLC		4 BROTHERS ROAD WAPPINGERS FALLS NY 12590	10/20/2020	10/20/2025
DOL	DOL		CHRISTOPHER GRECO		26 NORTH MYRTLE AVENUE SPRING VALLEY NY 10956	02/18/2021	02/18/2026
DOL	DOL		CHRISTOPHER J MAINI		19 CAITLIN AVE JAMESTOWN NY 14701	09/17/2018	09/17/2023
DOL	DOL		CHRISTOPHER PAPASTEFANO A/K/A CHRIS PAPASTEFANO		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL	*****1927	CONSTRUCTION PARTS WAREHOUSE, INC.	CPW	5841 BUTTERNUT ROAD EAST SYRACUSE NY 13057	09/12/2018	09/12/2023
DOL	DOL	*****3228	CROSS-COUNTY LANDSCAPING AND TREE SERVICE, INC.	ROCKLAND TREE SERVICE	26 NORTH MYRTLE AVENUE SPRING VALLEY NY 10956	02/18/2021	02/18/2026
DOL	DOL	*****2524	CSI ELECTRICAL & MECHANICAL INC		42-32 235TH ST DOUGLSTON NY 11363	01/14/2019	01/14/2024
DOL	NYC		DALJIT KAUR BOPARAI		185-06 56TH AVE FRESH MEADOW NY 11365	10/17/2017	10/17/2022
DOL	DOL		DANICA IVANOSKI		61 WILLETT ST. PASSAIC NJ 07503	10/26/2016	10/26/2021
DOL	DOL		DARIAN L COKER		2610 SOUTH SALINA ST SUITE 2CSYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL		DARIAN L COKER		2610 SOUTH SALINA ST SUITE 2CSYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	NYC		DAVID WEINER		14 NEW DROP LANE 2ND FLOORSTATEN ISLAND NY 10306	11/14/2019	11/14/2024
DOL	DOL		DEBBIE STURDEVANT		29 MAPLEWOOD DRIVE BINGHAMTON NY 13901	02/21/2017	02/21/2022
DOL	AG		DEBRA MARTINEZ		31 BAY ST BROOKLYN NY 11231	03/28/2018	03/28/2023
DOL	DOL		DELPHI PAINTING & DECORATING CO INC		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL		DF CONTRACTORS OF ROCHESTER, INC.		1835 DAANSEN RD. PALMYRA NY 14522	05/16/2017	05/16/2022
DOL	DOL		DF CONTRACTORS, INC.		1835 DAANSEN RD. PALMYRA NY 14522	05/16/2017	05/16/2022
DOL	NYC		DIMITRIOS TSOUMAS		35-12 19TH AVENUE ASTORIA NY 11105	08/02/2017	08/02/2022

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DOL	DOL		DOMENICO LAFACE		8531 OSWEGO RD BALDWINSVILLE NY 13027	02/03/2020	01/09/2023
DOL	DOL	*****3242	DONALD R. FORSAY	DF LAWN SERVICE	1835 DAANSEN RD. PALMYRA NY 14522	05/16/2017	05/16/2022
DOL	DOL		DONALD R. FORSAY		1835 DAANSEN RD. PALMYRA NY 14522	05/16/2017	05/16/2022
DOL	NYC		DUARTE LOPES		66-05 WOODHAVEN BLVD. STE 2REGO PARK NY 11374	04/20/2017	04/20/2022
DOL	DOL	*****5175	EAGLE MECHANICAL AND GENERAL CONSTRUCTION LLC		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025
DOL	DOL		EAST COAST PAVING		2238 BAKER RD GILLET PA 16923	03/12/2018	03/12/2023
DOL	NYC	*****4269	EAST PORT EXCAVATION & UTILITIES		601 PORTION RD RONKONKOMA NY 11779	11/18/2016	11/18/2021
DOL	DOL	*****0780	EMES HEATING & PLUMBING CONTR		5 EMES LANE MONSEY NY 10952	01/20/2002	01/20/3002
DOL	NYC	*****5917	EPOCH ELECTRICAL, INC		97-18 50TH AVE CORONA NY 11368	04/19/2018	04/19/2024
DOL	DOL	*****7403	F & B PAINTING CONTRACTING INC		2 PARKVIEW AVENUE HARRISON NY 10604	09/26/2016	09/26/2021
DOL	DOL		FAIGY LOWINGER		11 MOUNTAIN RD 28 VAN BUREN DRMONROE NY 10950	03/20/2019	03/20/2024
DOL	DOL		FRANK BENEDETTO		19 CATLIN AVE JAMESTOWN NY 14701	09/17/2018	09/17/2023
DOL	DOL		FRANK BENEDETTO		C/O F & B PAINTING CONTRA 2 PARKVIEW AVENUEHARRISON NY 10604	09/26/2016	09/26/2021
DOL	DOL	*****4722	FRANK BENEDETTO AND CHRISTOPHER J MAINI	B & M CONCRETE	19 CAITLIN AVE JAMESTOWN NY 14701	09/17/2018	09/17/2023
DOL	NYC		FRANK MAINI		1766 FRONT ST YORKTOWN HEIGHTS NY 10598	01/17/2018	01/17/2023
DOL	NYC	*****6616	G & G MECHANICAL ENTERPRISES, LLC.		1936 HEMPSTEAD TURNPIKE EAST MEDOW NY 11554	11/29/2019	11/29/2024
DOL	DOL		GABRIEL FRASSETTI			04/10/2019	04/10/2024
DOL	DOL		GEOFF CORLETT		415 FLAGGER AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	DA		GEORGE LUCEY		150 KINGS STREET BROOKLYN NY 11231	01/19/1998	01/19/2998
DOL	DOL		GIGI SCHNECKENBURGER		261 MILL RD EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	DOL		GIOVANNI LAFACE		8531 OSWEGO RD BALDWINSVILLE NY 13027	02/03/2020	01/09/2023
DOL	NYC	*****3164	GLOBE GATES INC	GLOBAL OVERHEAD DOORS	405 BARRETTO ST BRONX NY 10474	05/31/2018	05/31/2023
DOL	NYC		GREAT ESTATE CONSTRUCTION, INC.		327 STAGG ST BROOKLYN NY 11206	10/10/2017	10/10/2022
DOL	DOL		GREGORY S. OLSON		P.O BOX 100 200 LATTA BROOK PARKHORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL		HANS RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	NYC	*****3228	HEIGHTS ELEVATOR CORP.		1766 FRONT ST YORKTOWN HEIGHTS NY 10598	01/17/2018	01/17/2023
DOL	DOL	*****5131	INTEGRITY MASONRY, INC.	M&R CONCRETE	722 8TH AVE WATERVLIET NY 12189	06/05/2018	06/05/2023
DOL	DOL		IRENE KASELIS		32 PENNINGTON AVE WALDWICK NJ 07463	05/30/2019	05/30/2024
DOL	DOL	*****9211	J. WASE CONSTRUCTION CORP.		8545 RT 9W ATHENS NY 12015	03/09/2021	03/09/2026
DOL	DOL		J.A. HIRES CADWALLADER		P.O BOX 100 200 LATTA BROOK PARKHORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL		JAMES C. DELGIACCO		722 8TH AVE WATERVLIET NY 12189	06/05/2018	06/05/2023
DOL	DOL		JAMES LIACONE		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL		JAMES RACHEL		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL	*****5368	JCH MASONRY & LANDSCAPING INC.		35 CLINTON AVE OSSINING NY 10562	09/12/2018	09/12/2023

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DOL	NYC		JENNIFER GUERRERO		1936 HEMPSTEAD TURNPIKE EAST MEADOW NY 11554	11/29/2019	11/29/2024
DOL	DOL		JESSICA WHITESIDE		C/O BRRESTORATION NY INC 140 ARCADIA AVENUEOSWEGO NY 13126	09/12/2016	09/12/2021
DOL	AG		JOHN ANTHONY MASSINO		36-49 204TH STREET BAYSIDE NY 11372	02/07/2018	02/07/2023
DOL	DOL		JOHN F. CADWALLADER		200 LATTA BROOK PARK HORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL	*****4612	JOHN F. CADWALLADER, INC.	THE GLASS COMPANY	P.O BOX 100 200 LATTA BROOK PARKHORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL		JOHN GOCEK		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL		JOHN WASE		8545 RT 9W ATHENS NY 12015	03/09/2021	03/09/2026
DOL	AG	*****0600	JOHNCO CONTRACTING, INC.		36-49 204TH STREET BAYSIDE NY 11372	02/07/2018	02/07/2023
DOL	DOL		JON E DEYOUNG		261 MILL RD P.O BOX 296EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	DOL		JORI PEDERSEN		415 FLAGER AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	DOL		JOSE CHUCHUCA		35 CLINTON AVE OSSINING NY 10562	09/12/2018	09/12/2023
DOL	NYC		JOSEPH FOLEY		66-05 WOODHAVEN BLVD. STE 2REGO PARK NY 11374	04/20/2017	04/20/2022
DOL	NYC		JOSEPH MARTINO		1535 RICHMOND AVENUE STATEN ISLAND NY 10314	12/13/2017	12/13/2022
DOL	DOL		JOY MARTIN		2404 DELAWARE AVE NIGARA FALLS NY 14305	09/12/2018	09/12/2023
DOL	DOL		JULIUS AND GITA BEHREND		5 EMES LANE MONSEY NY 10952	11/20/2002	11/20/3002
DOL	DOL	*****5062	K R F SITE DEVELOPMENT INC		375 LAKE SHORE DRIVE PUTNAM VALLEY NY 10579	01/23/2017	01/23/2022
DOL	NYC		K.S. CONTRACTING CORP.		29 PHILLIP DRIVE PARSIPPANY NJ 07054	02/13/2017	02/13/2022
DOL	DOL		KARIN MANGIN		796 PHELPS ROAD FRANKLIN LAKES NJ 07417	12/01/2020	12/01/2025
DOL	DOL		KATE E. CONNOR		7088 INTERSTATE ISLAND RD SYRACUSE NY 13209	03/31/2021	03/31/2026
DOL	DOL		KATIE BURDICK		2238 BAKER RD GILLET PA 16923	03/12/2018	03/12/2023
DOL	DOL	*****2959	KELC DEVELOPMENT, INC		7088 INTERSTATE ISLAND RD SYRACUSE NY 13209	03/31/2021	03/31/2026
DOL	DOL		KENNETH FIORENTINO		375 LAKE SHORE DRIVE PUTNAM VALLEY NY 10579	01/23/2017	01/23/2022
DOL	DOL	*****3490	L & M CONSTRUCTION/DRYWALL INC.		1079 YONKERS AVE YONKERS NY 10704	08/07/2018	08/07/2023
DOL	DA	*****8816	LAKE CONSTRUCTION AND DEVELOPMENT CORPORATION		150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	DOL	*****4505	LARAPINTA ASSOCIATES INC		29 MAPLEWOOD DRIVE BINGHAMTON NY 13901	02/21/2017	02/21/2022
DOL	DOL		LAVERN GLAVE		161 ROBYN RD MONROE NY 10950	01/30/2018	01/30/2023
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	06/24/2016	09/19/2022
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	06/24/2016	09/19/2022
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	01/17/2017	09/19/2022
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	08/14/2017	09/19/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022

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DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	08/14/2017	08/14/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	01/17/2017	09/19/2022
DOL	DA	*****4460	LONG ISLAND GLASS & STOREFRONTS, LLC		4 MANHASSET TRL RIDGE NY 11961	09/06/2018	09/06/2023
DOL	AG	*****4216	LOTUS-C CORP.		81-06 34TH AVENUE APT. 6EJACKSON HEIGHTS NY 11372	02/07/2018	02/07/2023
DOL	DOL		LOUIS A. CALICCHIA		1223 PARK ST. PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	NYC		LUBOMIR PETER SVOBODA		27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	NYC		M & L STEEL & ORNAMENTAL IRON CORP.		27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	DOL		M ANVER BEIG		142 EAST MARKET STREET LONG BEACH NY 11561	03/07/2017	03/07/2022
DOL	DOL		M. ANVER BEIG		142 EAST MARKET STREET LONG BEACH NY 11561	03/07/2017	03/07/2022
DOL	DOL	*****1784	MADISON AVE CONSTRUCTION CORP		39 PENNY STREET WEST ISLIP NY 11795	11/02/2016	11/02/2021
DOL	DOL	*****2196	MAINSTREAM SPECIALTIES, INC.		11 OLD TOWN RD SELKIRK NY 12158	02/02/2021	02/02/2026
DOL	DA		MANUEL P TOBIO		150 KINGS STREET BROOKLYN NY 14444	08/19/1998	08/19/2998
DOL	DA		MANUEL TOBIO		150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	NYC		MAREK FABIJANOWSKI		50 MAIN ST WHITE PLAINS NY 10606	01/04/2019	01/04/2024
DOL	NYC		MARTINE ALTER		1010 NORTHERN BLVD. GREAT NECK NY 11021	03/09/2017	03/09/2022
DOL	DOL		MARVIN A STURDEVANT		29 MAPLEWOOD DRIVE BINGHAMTON NY 13901	02/21/2017	02/21/2022
DOL	DOL		MASONRY CONSTRUCTION, INC.		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	*****3333	MASONRY INDUSTRIES, INC.		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	NYC		MATINA KARAGIANNIS		97-18 50TH AVE CORONA NY 11368	04/19/2018	04/19/2023
DOL	DOL		MATTHEW P. KILGORE		4156 WILSON ROAD EAST TABERG NY 13471	03/26/2019	03/26/2024
DOL	DOL		MAURICE GAWENO		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		MCLEAN "MIKKI BEANE"		1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL		MCLEAN "MIKKI" DRAKE		1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL		MCLEAN M DRAKE-BEANE		1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL	*****9445	MCLEAN M WALSH	ELITE PROFESSION AL PAINTING OF CNY	1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL	*****9445	MCLEAN M WALSH	ELITE PROFESSION AL PAINTING OF CNY	1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL		MICHAEL LENIHAN		1079 YONKERS AVE UNIT 4YONKERS NY 10704	08/07/2018	08/07/2023
DOL	AG		MICHAEL RIGLIETTI		31 BAY ST BROOKLYN NY 11231	03/28/2018	03/28/2023
DOL	DOL	*****4829	MILESTONE ENVIRONMENTAL CORPORATION		704 GINESI DRIVE SUITE 29MORGANVILLE NJ 07751	04/10/2019	04/10/2024
DOL	NYC	*****9926	MILLENNIUM FIRE PROTECTION, LLC		325 W. 38TH STREET SUITE 204NEW YORK NY 10018	11/14/2019	11/14/2024
DOL	NYC	*****0627	MILLENNIUM FIRE SERVICES, LLC		14 NEW DROP LNE 2ND FLOORSTATEN ISLAND NY 10306	11/14/2019	11/14/2024

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DOL	NYC	*****3826	MOVING MAVEN OF NY, INC.		1010 NORTHERN BLVD. GREAT NECK NY 11021	03/09/2017	03/09/2022
DOL	NYC	*****3550	MOVING MAVEN, INC		1010 NORTHERN BLVD. GREAT NECK NY 11021	03/09/2017	03/09/2022
DOL	AG		MSR ELECTRICAL CONSTRUCTION CORP.		31 BAY ST BROOKLYN NY 11231	03/28/2018	03/28/2023
DOL	DOL		MUHAMMAD BEIG		142 EAST MARKET STREET LONG BEACH NY 11561	03/07/2017	03/07/2022
DOL	DOL		MUHAMMAD BEIG		142 EAST MARKET STREET LONG BEACH NY 11561	03/07/2017	03/07/2022
DOL	NYC		MUHAMMED A. HASHEM		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	DA	*****9786	NATIONAL INSULATION & GC CORP		180 MILLER PLACE HICKSVILLE NY 11801	12/12/2018	12/12/2023
DOL	NYC		NICHOLAS FILIPAKIS		7113 FORT HAMILTON PARKWA BROOKLYN NY 11228	12/09/2016	12/09/2021
DOL	DOL	*****7429	NICOLAE I. BARBIR	BESTUCCO CONSTRUCTI ON, INC.	444 SCHANTZ ROAD ALLEN TOWN PA 18104	09/17/2020	09/17/2025
DOL	DOL	*****6966	NORTH COUNTRY DRYWALL AND PAINT		23167 COUNTY ROUTE 59 DEXTER NY 13634	10/24/2016	10/24/2021
DOL	DOL	*****0065	NORTHEAST LANDSCAPE AND MASONRY ASSOC		3 WEST MAIN ST/SUITE 208 ELMSFORD NY 10523	01/23/2017	01/23/2022
DOL	DOL	*****1845	OC ERECTERS, LLC A/K/A OC ERECTERS OF NY INC.		1207 SW 48TH TERRACE DEERFIELD BEACH FL 33442	01/16/2018	01/16/2023
DOL	NYC	*****0818	ONE TEN RESTORATION, INC.		2366 61ST ST BROOKLYN NY 11204	12/15/2016	12/15/2021
DOL	NYC		PARESH SHAH		29 PHILLIP DRIVE PARSIPPANY NJ 07054	02/13/2017	02/13/2022
DOL	DOL		PAULINE CHAHALES		935 S LAKE BLVD MAHOPAC NY 10541	03/02/2021	03/02/2026
DOL	NYC	*****9422	PELIUM CONSTRUCTION, INC.		22-33 35TH ST. ASTORIA NY 11105	12/30/2016	12/30/2021
DOL	DOL		PETER M PERGOLA		3 WEST MAIN ST/SUITE 208 ELMSFORD NY 10523	01/23/2017	01/23/2022
DOL	DOL		PETER STEVENS		11 OLD TOWN ROAD SELKIRK NY 12158	02/02/2021	02/02/2026
DOL	DOL		PIERRE LAPORT		224 COUNTY HIGHWAY 138 BROADALBIN NY 12025	03/07/2017	03/07/2022
DOL	DOL	*****1543	PJ LAPORT FLOORING INC		224 COUNTY HIGHWAY 138 BROADALBIN NY 12025	03/07/2017	03/07/2022
DOL	NYC	*****5771	PMJ ELECTRICAL CORP		7113 FORT HAMILTON PARKWA BROOKLYN NY 11228	12/09/2016	12/09/2021
DOL	DOL	*****0466	PRECISION BUILT FENCES, INC.		1617 MAIN ST PEEKSKILL NY 10566	03/03/2020	03/03/2025
DOL	NYC	*****4532	PROFESSIONAL PAVERS CORP.		66-05 WOODHAVEN BLVD. REGO PARK NY 11374	04/20/2017	04/20/2022
DOL	NYC		RASHEL CONSTRUCTION CORP		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	DOL	*****1068	RATH MECHANICAL CONTRACTORS, INC.		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	DOL	*****2633	RAW POWER ELECTRIC CORP		3 PARK CIRCLE MIDDLETOWN NY 10940	01/30/2018	01/30/2023
DOL	AG	*****7015	RCM PAINTING INC.		69-06 GRAND AVENUE 2ND FLOORMASPETH NY 11378	02/07/2018	02/07/2023
DOL	DOL		REGINALD WARREN		161 ROBYN RD MONROE NY 10950	01/30/2018	01/30/2023
DOL	DOL	*****9148	RICH T CONSTRUCTION		107 WILLOW WOOD LANE CAMILLUS NY 13031	11/13/2018	11/13/2023
DOL	DOL		RICHARD MACONE		8617 THIRD AVE BROOKLYN NY 11209	09/17/2018	09/17/2023
DOL	DOL		RICHARD REGGIO		1617 MAIN ST PEEKSKILL NY 10566	03/03/2020	03/03/2025
DOL	DOL	*****9148	RICHARD TIMIAN	RICH T CONSTRUCTI ON	108 LAMONT AVE SYRACUSE NY 13209	10/16/2018	10/16/2023
DOL	DOL		RICHARD TIMIAN JR.		108 LAMONT AVE SYRACUSE NY 13209	10/16/2018	10/16/2023
DOL	DOL		RICHARD TIMIAN JR.		108 LAMONT AVE SYRACUSE NY 13209	11/13/2018	11/13/2023
DOL	DOL		ROBBYE BISSESEAR		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	01/11/2003	01/11/3003

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DOL	DOL		ROBERT A. VALERINO		3841 LANYARD COURT NEW PORT RICHEY FL 34652	07/09/2019	07/09/2024
DOL	DOL		ROBERT BRUNO		3 GAYLORD ST AUBURN NY 13021	11/15/2016	11/15/2021
DOL	DOL		ROBERT BRUNO		5 MORNINGSIDE DRIVE AUBURN NY 13021	05/28/2019	05/28/2024
DOL	NYC		ROBERT HOHMAN		149 FIFTH AVE NEW YORK NY 10010	12/29/2016	12/29/2021
DOL	DOL		RODERICK PUGH		404 OAK ST SUITE 101SYRACUSE NY 13203	07/23/2018	07/23/2023
DOL	DOL	*****4880	RODERICK PUGH CONSTRUCTION INC.		404 OAK ST SUITE 101SYRACUSE NY 13203	07/23/2018	07/23/2023
DOL	DOL		ROMEO WARREN		161 ROBYN RD MONROE NY 10950	01/30/2018	01/30/2023
DOL	DOL		RONALD MESSEN		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL		ROSEANNE CANTISANI			06/12/2018	06/12/2023
DOL	DOL		RYAN ALBIE		21 S HOWELLS POINT ROAD BELLPORT NY 11713	02/21/2017	02/21/2022
DOL	DOL	*****3347	RYAN ALBIE CONTRACTING INC		21 S HOWELLS POINT ROAD BELLPORT NY 11713	02/21/2017	02/21/2022
DOL	DOL	*****1365	S & L PAINTING, INC.		11 MOUNTAIN ROAD P.O BOX 408MONROE NY 10950	03/20/2019	03/20/2024
DOL	DOL	*****7730	S C MARTIN GROUP INC.		2404 DELAWARE AVE NIAGARA FALLS NY 14305	09/12/2018	09/12/2023
DOL	NYC	*****0349	SAM WATERPROOFING INC		168-42 88TH AVENUE APT.1 AJAMAICA NY 11432	11/20/2019	11/20/2024
DOL	NYC		SANDEEP BOPARAI		185-06 56TH AVE FRESH MEADOW NY 11365	10/17/2017	10/17/2022
DOL	DOL	*****9751	SCW CONSTRUCTION		544 OLD ROUTE 23 ACRE NY 12405	02/14/2017	02/14/2022
DOL	NYC	*****6597	SHAIRA CONSTRUCTION CORP.		421 HUDSON STREET SUITE C5NEW YORK NY 10014	02/20/2019	02/20/2024
DOL	DOL	*****1961	SHANE BURDICK	CENTRAL TRAFFIC CONTROL, LLC.	2238 BAKER ROAD GILLET PA 16923	03/12/2018	03/12/2023
DOL	DOL		SHANE BURDICK		2238 BAKER ROAD GILLET PA 16923	03/12/2018	03/12/2023
DOL	DOL		SHANE NOLAN		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL		SHULEM LOWINGER		11 MOUNTAIN ROAD 28 VAN BUREN DRMONROE NY 10950	03/20/2019	03/20/2024
DOL	DOL	*****0816	SOLAR ARRAY SOLUTIONS, LLC		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL	*****2221	SOUTH BUFFALO ELECTRIC, INC.		1250 BROADWAY ST BUFFALO NY 14212	02/03/2020	02/03/2025
DOL	DOL	*****3496	STAR INTERNATIONAL INC		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	08/11/2003	08/11/3003
DOL	DOL	*****6844	STEAM PLANT AND CHX SYSTEMS INC.		14B COMMERCIAL AVENUE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL	*****9933	STEED GENERAL CONTRACTORS, INC.		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL		STEFANOS PAPASTEFANOU, JR. A/K/A STEVE PAPASTEFANOU, JR.		256 WEST SADDLE RIVER RD UPPER SADDLE RIVER NJ 07458	05/30/2019	05/30/2024
DOL	DOL	*****9751	STEPHEN C WAGAR		544 OLD ROUTE 23 ACRE NY 12405	02/14/2017	02/14/2022
DOL	DOL		STEVE TATE		415 FLAGER AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	NYC		STEVEN GOVERNALE		601 PORTION RD RONKONKOMA NY 11779	11/18/2016	11/18/2021
DOL	DOL		STEVEN MARTIN		2404 DELWARE AVE NIAGARA FALLS NY 14305	09/12/2018	09/12/2023
DOL	DOL		STEVEN TESTA		50 SALEM STREET - BLDG B LYNNFIELD MA 01940	01/23/2017	01/23/2022
DOL	NYC	*****5863	SUKHMANY CONSTRUCTION, INC.		185-06 56TH AVE FRESH MEADOW NY 11365	10/17/2017	10/17/2022
DOL	DOL	*****1060	SUNN ENTERPRISES GROUP, LLC		370 W. PLEASANTVIEW AVE SUITE 2.329HACKENSACK NJ 07601	02/11/2019	02/11/2024

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DOL	DOL	*****8209	SYRACUSE SCALES, INC.		158 SOLAR ST SYRACUSE NY 13204	01/07/2019	01/07/2024
DOL	DOL		TALAILA OCAMPA		1207 SW 48TH TERRACE DEERFIELD BEACH FL 33442	01/16/2018	01/16/2023
DOL	DOL		TERRY THOMPSON		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025
DOL	DOL		TEST		P.O BOX 123 ALBANY NY 12204	05/20/2020	05/20/2025
DOL	DOL	*****6789	TEST1000		P.O BOX 123 ALBANY NY 12044	03/01/2021	03/01/2026
DOL	DOL	*****5570	TESTA CORP		50 SALEM STREET - BLDG B LYNNFIELD MA 01940	01/23/2017	01/23/2022
DOL	DOL	*****5766	THE COKER CORPORATION	COKER CORPORATIO N	2610 SOUTH SALINA ST SUITE 14SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	DOL	*****5766	THE COKER CORPORATION	COKER CORPORATIO N	2610 SOUTH SALINA ST SUITE 14SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL	*****8311	TRIPLE B FABRICATING, INC.		61 WILLETT ST. PASSAIC NJ 07503	10/26/2016	10/26/2021
DOL	DOL	*****6392	V.M.K CORP.		8617 THIRD AVE BROOKLYN NY 11209	09/17/2018	09/17/2023
DOL	DOL	*****6418	VALHALLA CONSTRUCTION, LLC.		796 PHLEPS ROAD FRANKLIN LAKES NJ 07417	12/01/2020	12/01/2025
DOL	NYC	*****7361	VIALE HOLDINGS, INC.	MOVING MAVEN	1010 NORTHERN BLVD. GREAT NECK NY 11021	03/09/2017	03/09/2022
DOL	DOL		VICTOR ALICANTI		42-32 235TH ST DOUGLSTON NY 11363	01/14/2019	01/14/2024
DOL	NYC		VIKTAR PATONICH		2630 CROSEY AVE BROOKLYN NY 11214	10/30/2018	10/30/2023
DOL	DOL		VIKTORIA RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	NYC		VITO GARGANO		1535 RICHMOND AVE STATEN ISLAND NY 10314	12/13/2017	12/13/2022
DOL	NYC	*****3673	WALTERS AND WALTERS, INC.		465 EAST AND THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	DOL		WAYNE LIVINGSTON JR	NORTH COUNTRY DRYWALL AND PAINT	23167 COUNTY ROUTE 59 DEXTER NY 13634	10/24/2016	10/24/2021
DOL	DOL	*****3296	WESTERN NEW YORK CONTRACTORS, INC.		3841 LAYNARD COURT NEW PORT RICHEY FL 34652	07/09/2019	07/09/2024
DOL	DOL		WHITE PLAINS CARPENTRY CORP		442 ARMONK RD	06/12/2018	06/12/2023
DOL	DOL		WILLIAM C WATKINS		1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL		WILLIAM DEAK		C/O MADISON AVE CONSTR CO 39 PENNY STREETWEST ISLIP NY 11795	11/02/2016	11/02/2021
DOL	DOL	*****4043	WINDSHIELD INSTALLATION NETWORK, INC.		200 LATTA BROOK PARK HORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL	*****4730	XGD SYSTEMS, LLC	TDI GOLF	415 GLAGE AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	NYC		ZAKIR NASEEM		30 MEADOW ST BROOKLYN NY 11206	10/10/2017	10/10/2022
DOL	NYC	*****8277	ZHN CONTRACTING CORP		30 MEADOW ST BROOKLYN NY 11206	10/10/2017	10/10/2022

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 1A - SCHEDULES AND REPORTS

CONTENTS:

1. Summary of the Work
2. Laws, Ordinances, Taxes, and Permits
3. Plan of Operations and Progress Schedule
4. Sequence of Work
5. Contractor's Examination
6. Notification of Owner and Architect
7. Access and Movement of Materials and Personnel
8. Job Meetings
9. Equal Opportunity
10. Wage Rates

1. SUMMARY OF THE WORK:

- A. All work as shown on the drawings and as specified herein.

2. LAWS, ORDINANCES, TAXES, AND PERMITS:

A. Taxes and Permits:

1. Exempt from New York State Sales Tax.
2. Exempt from Federal Excise Tax.
3. Not subject to building permit fees.

B. Laws and Ordinances:

The Project is subject to and Contractor shall comply with:

1. New York State Wage Rate Requirements.
2. Federal Occupational Safety and Health Administration Standards.
3. Applicable local, state, and other governing safety regulations.

3. PLAN OF OPERATIONS AND PROGRESS SCHEDULES:

- A. In order to facilitate coordination and fitting, the Contractor shall prepare a "Plan of Operations and Progress Schedule" which shall show concisely the manner in which work will be started, prosecuted, and completed.
- B. After approval of the above document, the Contractor shall be responsible for seeing that it is adhered to and for ascertaining that proper coordination is maintained between work of all Contracts.

4. SEQUENCE OF WORK:

- A. It is intended that the work under this Contract be executed without interruption of and with minimum interference with school operations.
- B. Notify utility companies as required by local ordinance and State Law.
- C. Ascertain location of utilities inside and outside of building before commencing demolition work of any kind.
- D. Take precautions to protect the adjacent spaces and surfaces from flying or falling debris. Prevent dust and dirt from rising and clean any dust created by this work.
- E. Contractor shall not employ any labor, materials, or means whose employment or utilization during the course of the work tend to or in any way cause or result in strikes, work stoppages, delays, suspension of work, or similar troubles by workmen under his employ, his Subcontractors, or any of the trades working in or about the premises where work of this Contract is being performed.
- F. The work shall be done with due care; the Contractor will be held responsible for any damage which may be caused thereby to any part or parts of existing structures, site, or items designated to remain. Before proceeding with demolition work, ascertain need for and accomplish any required protection measures. Embedded anchorage and attachments shall be removed to permit proper patching. Contractor will be liable for damage caused to any parts of existing structure or work designated to remain.
- G. Where removal work occurs or where new and old work join, the immediate adjacent surfaces or so much thereof as is required by the involved conditions shall be cut, removed, patched, repaired, or refinished, and left in as good a condition as existed prior to the commencing of the work. The materials and workmanship employed shall conform to that of the original work.
- H. The Contractor shall establish and maintain a rate of work progress so as to insure completion of the construction operations within the time stipulated in the Agreement.
- I. Where materials or construction are to be applied or attached to existing surfaces or construction and to have included in his bid all costs for preparatory work on such surfaces or construction as necessary to permit the proper execution of the required work.
- J. Upon completion of all work under this Section, the Contractor shall remove all tools, materials, plant, apparatus, and rubbish of any sort. The premises shall be left clean, neat, and orderly to the entire satisfaction of the Architect.

5. CONTRACTOR'S EXAMINATION:

- A. Contractor shall take all field measurements as required and shall satisfy himself as to the nature of equipment and facilities required for and the conditions under which he will be obliged to carry out the execution of the work in every particular which might in any way affect the cost thereof. The submission of a Proposal will be construed as conclusive evidence that such an examination has been made, and no subsequent claims for additional costs of labor, materials, appliances, equipment, etc., or for difficulties encountered which could have been foreseen has such an examination been made, will be recognized.

6. NOTIFICATION OF OWNER AND ARCHITECT:

- A. Before starting any work relating to existing utilities or school services, the Contractor will be required to give 24 hours notice to the Architect and Owner and obtain their approval in writing before proceeding with such work.
- B. All work involving active utility or school service shall be performed with the utmost dispatch and without discontinuance or disruption of such services except as and when approved by the Owner.

7. ACCESS AND MOVEMENT OF MATERIALS AND PERSONNEL:

- A. The direction of the Owner as to access to the existing building and the limits within which each Contractor shall control the movements of his personnel and materials shall be strictly followed. Generally, the movement of Contractor's personnel within the premises shall be restricted to the minimum necessary for the performance of required work. Under no circumstances shall Contractor's personnel at any time enter upon any portions of the building or premises where such entry is not strictly necessitated by the work required under this Contract. The Contractor shall rigidly enforce these restrictions; violation thereof shall be cause for dismissal of the offender.
- B. Delivery of equipment and materials shall be confined to the limits designated, and storage shall be where directed by the Owner. Temporary enclosures necessary for such storage shall be provided by the Contractor and shall be removed when no longer required.
- C. All work in the existing building shall be performed with the least possible annoyance to the occupants of the building.

8. JOB MEETINGS:

- A. Pre-Construction Conference: Upon receiving notice that he has been awarded the Construction Contract for the project, and within ten (10) days of such notice, the Contractor shall make an appointment to meet with the Architect and his representative(s), and shall also instruct his Subcontractors or their representatives to be made personally known to each other and to plan and initiate the most favorable course of the upcoming construction work.

- B. Regular Job Meeting: The Contractor, Architect, and those Subcontractors whose presence is necessary, shall attend periodic meetings for the purpose of discussing the progress and execution of the work. These meetings shall be held at a time and place designated by the Owner's Representative. The proceedings of these meetings will be recorded by the Owner's Representative and a copy will be subsequently furnished the Contractor for his use. It will be the Contractor's responsibility to distribute copies, as may be required, to his Subcontractors.

9. EQUAL OPPORTUNITY (LABOR LAW SECTION 220-3):

- A. The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor shall take affirmative action to insure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, 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. The Contractor agrees to post, in conspicuous places available to employees and applicants for employment, notices to be provided setting forth the provisions of the non-discrimination clause.
- B. The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.
- C. The Contractor shall send to each labor union or representative of workers with which he has a collective bargaining agreement or other Contract or understanding a notice to be provided advising the said labor union or worker's representatives of the Contractor's commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- D. The Contractor shall comply with Executive Order 11246, Federal Equal Employment Opportunity, unless exempt, in accordance with Section 203 of this order.

10. WAGE RATES:

- A. The Labor Law of New York State 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, workmen, and mechanics employed on public work projects including supplements for welfare, pension, retirement, vacation, and other benefits, in accordance with prevailing practice in the locality. The Contractor shall comply with all requirements of this law as it applies to this project and locality.
- B. The rates of wages determined by the New York State Industrial Commissioner pursuant to the Labor Law are set forth as per the schedule contained within this Project Manual.

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 1B - TEMPORARY SERVICES AND MISCELLANEOUS REQUIREMENTS

CONTENTS:

1. Scope
2. Temporary Utilities
3. Temporary Barricades
4. Fire Protection
5. Parking and Traffic Control
6. Restoration of Premises
7. Cutting and Patching
8. Rough Openings and Routine Items
9. Water Tightness
10. Miscellaneous Requirements

1. SCOPE:

- A. Provide, maintain, and remove when no longer required temporary services and utilities as specified, except as may be otherwise provided by the Owner; include costs of obtaining permits, labor, equipment, fixtures, lamps, and similar items as well as duties, levies, or taxes imposed.

2. TEMPORARY UTILITIES:

- A. Water and electricity for construction purposes in quantities judged reasonable by the Architect will be furnished to the Contractor by the Owner without charge. The Contractor shall ascertain where these services will be available, make temporary connections as required, and remove same upon completion.
- B. Temporary toilets: The Owner will allow the use of certain toilets within the building during the course of the work, maintain in sanitary condition, and, upon completion of the work, surrender them to the Owner in as good condition as found.

3. TEMPORARY BARRICADES:

- A. Temporary closures and barricades, as may be required to maintain and protect the new and existing work and to protect the public from danger, shall be provided.
- B. Protect temporary closures and barricades to guard new and existing work from vandalism during and after working hours.

4. FIRE PROTECTION AND PREVENTION:

- A. Each Prime Contractor shall take all precautions required to prevent fires as a result of his operations. Flame cutting torches, blow torches, or welding tools shall be used in strict accordance with applicable safety rules and regulations.

- B. When welding tools or torches of any type are in use, the Prime Contractor using such equipment shall have available a fire extinguisher of the Multi-Purpose Type ABC in the immediate vicinity of the work. The fire extinguishers shall be provided and maintained by said Contractor in usable condition at all times.
- C. In addition to the requirements of Paragraphs A and B above, the General Work Contractor shall provide fire extinguishers in working order located at intervals throughout the construction operations. These extinguishers shall not be removed from their mounting except to be tested or for the purpose of fighting a fire. They shall be relocated as necessary by the General Work Contractor when progress of the work demands. These fire extinguishers will remain the property of the General Work Contractor.
- D. Keep fire hydrants on or adjacent to the work accessible to fire fighting equipment at all times.

5. PARKING AND TRAFFIC CONTROL:

- A. Parking on site will be at the Owner's discretion and approval only.
- B. Protect existing roads and repair damage caused to road or site.

6. RESTORATION OF PREMISES:

- A. Walls and floor areas and any other surfaces that are broken, damaged, pitted, or otherwise defective as a result of receiving, handling, or storage of materials or the performance of any work under any Contract, or by reason of neglect of any Contractor, shall be fully restored to the satisfaction of the Owner, and the full cost, therefore, shall be borne by the Contractor.
- B. Sites shall be cleaned daily and restored to original condition at completion of construction operations.
- C. Roll-offs shall be located so as not to interfere with school operations, and paving or landscaping shall be restored when removals are completed.

7. CUTTING AND PATCHING:

- A. Cutting and patching covers adjustment to, necessary reworking, or removal of elements of construction in both new and existing work to comply with work of the Contract documents. The following definitions for cutting and patching apply:
 - 1. Cutting: Physical modification or removal of construction work (walls, floors, ceilings, roofs, etc.) or installed materials (doors, windows, panels, etc.), both new, factory-finished, and existing.
 - 2. Patching: Restoration or replacement of construction work (walls, floors, ceilings, roofs, etc.), both new, factory-finished, and existing. Patching shall include installation of new finish, materials, and reconstruction of walls, floors, etc. All patching shall match adjacent materials and finishes unless otherwise indicated.

- B. Each Prime Contractor, unless otherwise indicated, shall hire a qualified General Contractor to provide all equipment, labor, material, and incidentals necessary for cutting and patching as required for the installation of his work in new or existing walls, floors, and ceilings.
- C. Each Prime Contractor will be held responsible for his own and his Subcontractors' work in cutting and patching and the correction of the work of other Prime Contractors if damaged by him.
- D. Each Prime Contractor shall bear the expense of all cutting, patching, repairing, or replacing of the work of other trades made necessary by any fault, error, or tardiness on the part of or damage done by him. He shall employ and pay the Contractor whose work is involved.
- E. In existing structures, each Prime Contractor shall, unless otherwise indicated, hire a General Contractor to do all cutting, patching, repairing, or replacing of General Work required for the removal of existing work or installation of his new work. Secure approval before cutting.
- F. In no case may floors, walls, or ceilings that are waterproofed be cut for the admission of any equipment or materials nor may any structural member be pierced without written permission.
- G. Where roofing or waterproofing membranes must be cut to accommodate the work of any Prime Contractor, such Prime Contractor shall employ a qualified roofing Contractor to do all required cutting, patching, and repairs of the roofing or waterproofing, and then only after approval of the methods proposed by the Architect and/or any agency that may have a roof bond or guarantee/warranty in force.
 - 1. Approval of all materials, methods, and roofing Contractor used in cutting, patching, and repairing existing roofing membrane shall be obtained from agency, or agencies, holding a roof bond or guarantee/warranty in force.

8. ROUGH OPENINGS AND ROUTINE ITEMS:

- A. Each Prime Contractor will provide all openings, chases, recesses, lintels, and bucks in new or existing construction that are required for the admission of his work.
- B. Each Prime Contractor shall furnish all necessary information (i.e. location and size of openings, chases, etc., and other built-in field conditions) to the other Prime Contractors in ample time for the installation of his work.
 - 1. Ample time shall mean:
 - a. In concrete work, before reinforcing is placed.
 - b. In masonry, before wall construction reaches location of opening, chase, or other item.
 - c. In drywall, before second or finish face is applied.
 - 2. This paragraph shall not be construed to include any items in earth such as trenches, etc.

9. WATER TIGHTNESS:

- A. Each Prime Contractor shall be held responsible for the water tightness of his respective products, materials, and workmanship as installed in the job. This includes all work either specified to be watertight or inferred by general practice to be watertight. All walls, roofs, glazing, windows, doors, sleeves, through foundation or walls, flashings, and other items shall be in a watertight condition before final payment is requested.
- B. If a Prime Contractor feels that the details or materials, as drawn or specified, are not satisfactory to produce a watertight job, he shall so inform the Architect before installation. The Prime Contractor shall submit his proposed substitution or alternative method of doing the work for the Architect's approval. Any approved change shall be executed by the Prime Contractor and made watertight at no additional cost to the Owner.
- C. Any proposed changes encountered during the bidding procedure may be submitted in the proper form and time to the Architect for consideration as a change to be covered by ADDENDA.

10. MISCELLANEOUS REQUIREMENTS:

- A. Contractor shall verify all existing conditions prior to proceeding with new work installations.
- B. Contractor shall be responsible for all verification of dimensions shown.
- C. Contractor shall retain all existing fire exit locations with the school complex during construction as necessary to provide safe egress to all inhabitants as per State and Local Codes.
- D. Contractor shall seal all areas of construction to prevent dust and debris from entering areas other than location of installation.
- E. Contractor shall meet all OSHA requirements for sanding and sealing as required.
- F. Contractor shall protect all existing walls, equipment, and apparatus from damage during the construction process.
- G. Contractor shall construct Architect/O.S.H.A. approved, code compliant barricades and construction area separation between all proposed work and student occupied spaces. There shall be no interference with required educational capabilities during the construction of this project while classes are in session.
- H. Contractor shall relocate any existing H.V.A.C. intake/discharge units as to prevent the distribution of any demolition/construction related fumes and dust during the course of the entire project. Relocate same to original functioning position upon project completion.

- I. All construction materials, equipment, personnel, debris, dust, fumes, noise, smells, etc. shall be isolated from building occupants and other vehicular traffic by way of "special necessary construction" during the entire construction process. provide all required temporary stairs, ramps, fire alarm systems, fire extinguishers, illuminated exit signs, door hardware, and floor finishes needed to maintain all occupied spaces safe and code compliant at all times.
- J. Contractor must provide schedules of work which include a minimum of 48 hours or manufacturer's recommended time for "baking out" and exhausting of volatile organic compounds used during construction prior to building occupancy. Provide and maintain at the site "MSDS" forms indicating safe times before occupancy of spaces.
- K. The District must provide a continuously updated written emergency exit plan which provides for the relocation of all students and staff immediately upon a break in the above required "separation of construction areas" as to minimize exposure to all students and staff. Coordinate with all contractors, building staff, and students for their use.

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 1C - INSURANCE REQUIREMENTS

CONTENTS:

1. General Requirements
2. Certificates of Insurance
3. Types of Coverage and Minimum Limits
4. Continuity

1. GENERAL REQUIREMENTS:

- A. In addition to the requirements specified under Article 11 of the General Conditions and the insurance required by law, the Contractor shall, before commencing work under this Contract and during the period of construction to the date of final acceptance by the Owner, purchase, effect, and maintain insurance coverage as described in this section.
- B. No Subcontractor shall be permitted to undertake any portion of this Contract without first having presented to the Contractor certification attesting to similar coverages as are required of the Contractor under this section. Such certification shall be issued to and in a form acceptable to the Contractor.
- C. The Contractor agrees to effectuate the naming of the Owner and the Architect as additional insureds on the Contractor's insurance policies, with the exception of Workers' Compensation and NY State Disability.
- D. Each policy naming the Owner and Architect (and Construction Manager when applicable) as additional insureds must:
 1. Be an insurance policy from an A.M. Best A-rated or better insurer, licensed to conduct business in New York State; and
 2. State that the Contractor's coverage is primary and non-contributory coverage for the Owner, its Board of Education, employees and volunteers.
- E. The Contractor agrees to indemnify the Owner for any applicable deductibles and self-insured retentions.

2. CERTIFICATES OF INSURANCE:

- A. Certificates of Insurance shall be transmitted in duplicate to the Architect for forwarding to the Owner, and any Certificate found to be incomplete or not according to the proper form will be returned as being unsatisfactory. A letter of transmittal from each insurance company involved must be submitted certifying that the certificate is issued pursuant to their authorization.
- B. The Owner, Architect (and Construction Manager when applicable) must be listed as an additional insured by using standard or other endorsements

that extend coverage to the Owner, Architect (and Constuction Manager when applicable) for both on-going operations (CG 20 38) and products and completed operations (CG 20 37), latest version. The decision to accept an endorsement rests solely with the Owner. A completed copy of the endorsement(s) must be attached to the certificate of insurance. The certificate of insurance must describe the specific services provided by the Contractor (e.g., roofing, carpentry, or plumbing) that are covered by the liability policies. At the Owner's request, the Contractor will provide copies of the declarations pages of its liability and umbrella/excess policies with a list of endorsements and forms. If so requested, the Contractor will provide a copy of the policy endorsements and forms. A fully completed New York Construction Certificate of Liability Insurance addendum (ACORD 855 2014/05) must be included with the certificates of insurance. For any "Yes" answers on Items G through L on this addendum, additional details must be provided to the Owner in writing. Contracts with subcontractors shall require them to provide the same additional insured coverages and documents.

C. Certificates shall contain:

1. Name and address of the insured.
2. Job location and title of the Contract.
3. Policy number and expiration date.
4. Issuance date of Certificate.
5. Types of coverage included.
6. Limit of Liability for each type used.
7. Types of operations covered (Classifications).
8. Types of operations or of coverages specifically excluded.
9. Thirty (30) day cancellation or non-renewal notice.
10. Owner, Architect or Owner representatives as additional insured.
11. Hold Harmless Clause indemnifying Owner, Architect or Owner representatives
12. Name of Insurance Company.
13. Counter Signature of Resident Agent in State of project location.

D. No Certificate covering policies containing escape clauses or exclusions contrary to the Owner's interests will be accepted.

E. The delivery of Certificates of Insurance authorizes the Owner or Architect to make direct inquiry of and to receive direct response from the insurance carrier regarding questions arising during the performance of the Work which are pertinent to the coverages under the policies.

3. TYPES AND MINIMUM LIMITS OF COVERAGE:

A. The Contractor will obtain and keep in full force and effect during the term of the Contract, at the Contractor's sole cost and expense, the following insurance:

B. Commercial General Liability Insurance

- o \$1,000,000 per occurrence/ \$2,000,000 aggregate
- o \$2,000,000 Products and Completed Operations
- o \$1,000,000 Personal and Advertising Injury
- o \$100,000 Fire Damage
- o \$10,000 Medical Expense
- o The general aggregate must apply on a per-project basis.

C. Automobile Liability

- o \$1,000,000 combined single limit for owned, hired and borrowed and non-owned motor vehicles.

D. Workers' Compensation and NYS Disability Insurance

- o Statutory Workers' Compensation (C-105.2 or U-26.3); and New York State Disability Insurance (DB-120.1) for all employees. Proof of coverage must be on the approved specific form, as required by the New York State Workers' Compensation Board. ACORD certificates are not acceptable. A person seeking an exemption must file a CE-200 form with New York State. The form can be completed and submitted directly to the Workers' Compensation Board online.

E. Builders Risk

- o Must be purchased by the Contractor to include the interests of the Owner and Contractor jointly in a form satisfactory to the Owner. The limits must reflect the total completed value - all material and labor costs and provide coverage for fire, lightning, explosion, extended coverage, vandalism, malicious mischief, windstorm, hail and/or flood.

F. Umbrella/Excess Liability Insurance

- o Umbrella/Excess coverage must be on a follow-form basis.
- o With the exception of contracts that require work above a height of one story (ten feet), all contracts for less than or equal to \$1,000,000 will require an Umbrella/Excess Policy with limits of \$5,000,000 per occurrence/\$5,000,000 aggregate.
- o All contracts for more than \$1,000,000 or that require work above a height of one story (ten feet) will require an Umbrella/Excess Policy with limits of \$10,000,000 per occurrence/\$10,000,000 aggregate.

G. Asbestos, Lead and/or Hazardous Material Work

- o Asbestos/Lead Abatement Insurance: \$2,000,000 per occurrence/\$2,000,000 aggregate including products and completed operations.
- o Coverage for the Contractor's operations including, but not limited to removal, replacement, enclosure, encapsulation and/or 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. If a retroactive date is used, it must pre-date the inception of the Contract. If the Contractor is using motor vehicles for transporting hazardous materials, the Contractor must maintain pollution liability broadened coverage (ISO Endorsement CA 9948) as well as proof of MCS 90.
- o Coverage must extend for a period of three years following final completion of the Work.

- o Testing Company Errors and Omission Insurance: \$1,000,000 per occurrence/\$2,000,000 aggregate for the testing and other professional acts of the Contractor.
- H. The Contractor will obtain and keep in full force and effect during the term of this Contract, at the Contractor's sole cost and expense, Owners Contractors Protective (OCP) Insurance. The Owner will be the named insured on all OCP policies and there will be no additional insureds. The OCP Insurance must be from a carrier licensed to conduct business in New York State.
 - 1. With the exception of Contracts that require work above a height of one story (ten feet), all Contracts for less than or equal to \$1,000,000 will require an OCP Insurance Policy with limits of \$1,000,000 per occurrence/\$2,000,000 aggregate.
 - 2. All Contracts for more than \$1,000,000 or that require work above a height of one story (ten feet) will require an OCP Insurance Policy with limits of \$2,000,000 per occurrence/\$4,000,000 aggregate.
- I. Contractor's Contingent Liability: The Contractor shall procure, pay for, and maintain such insurance as will protect the Contractor from his contingent liability for damages and for injury to the person or property of another which may arise from the operations of all Subcontracts under this Contract.
- J. Contractor's and Employees' Equipment: The Contractor assumes responsibility for all injury to or destruction of the Contractor's materials, tools, machinery, equipment, appliances, shoring, scaffolding, false and form work, and personal property of Contractor's employees from whatever cause arises.

4. CONTINUITY:

- A. Contractor acknowledges that failure to obtain the foregoing insurance on behalf of the Owner constitutes a material breach of contract and subjects the Contractor to liability for damages, indemnification and all other legal remedies available to the Owner. The Contractor must provide the Owner with proof satisfactory to the Owner in the Owner's sole and absolute discretion that the above requirements have been met prior to the commencement of Work.
- B. The Contractor acknowledges that its failure to obtain or keep current the insurance coverage required by this Addendum shall constitute a material breach of Contract and subjects the Contractor to liability for damages, including but not limited to direct, indirect, consequential, special and such other damages the Owner sustains as a result of such breach. In addition, the Contractor shall be responsible for the indemnification to the Owner and the Architect, of any and all costs associated with such lapse in coverage, including but not limited to reasonable attorney's fees.

- C. The Contractor shall require all Subcontractors to carry the same insurance coverages and limits of liability, as are required to be carried by the Contractor and adjusted to the nature of Subcontractors' operations and submit proof of same to the Owner for approval prior to start of any Work. The Contractor shall also require that Subcontractors require Sub-Subcontractors to carry the same insurance coverages and limits of liability, as are required to be carried by the Contractor and adjusted to the nature of Sub-Subcontractors' operations and submit proof of same to the Owner for approval prior to the start of any Work. This includes, but is not limited to requiring that Subcontractors and Sub-Subcontractors name the Owner as an additional insured by using endorsements CG 2038 and CG 2037 or their equivalents and providing Acord 855 NY Form. In the event the Contractor fails to obtain the required certificates of insurance and other required proof of insurance from the Subcontractor or its subs and a claim is made or suffered, the Contractor shall, to the fullest extent of the law, indemnify, defend, and hold harmless the Owner, the Owner's Board of Education, the Architect, Engineers, Consultants, and Sub-consultants and their agents, employees, officers, or representatives from any and all claims for which the required insurance would have provided coverage. This indemnity obligation is in addition to any other indemnity obligation provided in the Contract.
- D. The Contractor assumes responsibility for all injury or destruction of the Contractor's materials, tools, machinery, equipment, appliances, shoring, scaffolding, false and form work, and personal property of the Contractor's employees from whatever cause arises. Any policy of insurance secured covering the Contractor or Subcontractors leased or hired by them and any policy of insurance covering the Contractor or Subcontractors against physical loss or damage to such property shall include an endorsement waiving the right of subrogation against the Owner for any loss or damage to such property.
- E. The Owner in good faith may adjust and settle a loss with the Contractor's insurance carrier.
- F. The Owner and the Contractor waive all rights against each other and any of their Subcontractors, Sub-subcontractors, agents and employees for damages caused by fire or other perils to the extent of actual recovery of any insurance proceeds under any property insurance policy procured, pursuant to this Addendum, or other property insurance applicable to the Contractor's Work.
- G. Before commencement of its Work, the Contractor shall obtain and pay for such insurance as may be required to comply with its obligations pursuant to the Contract, including, but not limited to any indemnification and hold harmless provisions.
- H. Review and acknowledgment of the Certificate of Insurance or other proof of insurance by the Owner or the Architect shall not relieve or decrease the liability of the Contractor hereunder.

- I. If the terms of policies expire 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 therefor, and to charge the cost thereof to the Contractor.
- J. In the event of loss by fire or other insured hazard during the term of the Contract, the Contractor shall cooperate with the Owner and Architect and the insurance adjusters in all procedures incidental to the expeditious adjustment of the loss and shall during this period maintain progress of construction. The Contractor will not be relieved from his obligations for the proper execution of his Contract except that the time of completion may be extended for such number of days as may have been delayed by reason of such loss, as determined by the Architect.

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 1D - PRODUCT APPROVAL STANDARD

CONTENTS:

1. Definitions
2. Proof of Compliance
3. Inclusion of Specification of Non-Specified Products
4. Consideration of Equivalents After Award of Contract

1. DEFINITIONS:

- A. The term "product" shall include material, equipment, assembly methods, manufacturer, brand, tradename, or other description.
- B. Reference to be approved equal or similar terms mean that approval of the Architect is required.

2. PROOF OF COMPLIANCE:

- A. Whenever the Contract Documents require that a product be in accordance with Federal Specifications, ASTM Designation, ANSI Specification, or other Association Standard, the Contractor shall present an affidavit from the manufacturer of a proposed product certifying that it complies therewith.
- B. Where requested or specified, submit supporting test data to substantiate compliance.

3. INCLUSION IN SPECIFICATION OF NON-SPECIFIED PRODUCTS:

- A. If a Contractor has based his bid upon products, materials, or items not specifically described or named in the specifications, he may be required, prior to Award of Contract, to submit the names, types, brand, or manufacturer of products included in his bid for the specified items.
- B. Supporting data documenting wherein the proposed materials, products, or equipment may vary from those specified may be required and will be the responsibility of the Contractor.
- C. The risk of whether bid equivalents will be accepted will be borne by the Contractor.

4. CONSIDERATION OF EQUIVALENTS AFTER AWARD OF CONTRACT:

- A. Equivalent products will be considered after Award of Contract if:
 1. Previously accepted or specified product is not available because of strike, lock out, bankruptcy, or discontinuance of its manufacture.
 2. Specified performance or guarantee cannot be attained in the Contractor's judgement.

- B. Additional products, when submitted for consideration, must be accompanied by documentation attesting to the foregoing and establish equivalency in the judgement of the Architect, the burden of proof for which shall be the Contractors.
- C. Request for product changes, other than equivalents, if accepted, shall be effected by Change Order.

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 1E - ALTERNATES

1. GENERAL REQUIREMENTS:

- A. Each Contractor shall state in his Proposal the amount to be added or deducted from his Base Bid for the difference in cost between the work described under each Alternate and the corresponding work specified under his Base Bid.
- B. Alternate bids shall reflect the increase or decrease in cost of all work of every nature which may be affected thereby, and no subsequent claims for extras by reason of the Contractor's failure to observe this requirement will be considered.
- C. Except as otherwise described or approved, material and workmanship required by the Alternates differ from the requirements shown on the drawings or specified for corresponding items, the Alternate's construction and materials will be subject to the approval of the Architect.
- D. Submit shop drawings and samples of the work under each accepted Alternate as per "General Conditions" requirements.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01020 - ALLOWANCES

1.01 WORK INCLUDED

- A. The Contractor shall provide all labor, materials, equipment and services so as to perform all work of this section and related work indicated on the Construction Drawings and as specified herein, including, but not limited to, the following:
1. Inclusion of the Allowances herein.
 2. In addition to the work indicated on the Construction Drawings and elsewhere in this Project Manual and specification, the Contractor shall perform additional work as may be ordered by the Owner's Representative, Owner, or Architect.
 3. The following amounts are for any additional work as may be required or ordered by the Owner, Owner's Representative, or Architect or required due to field related conditions. Any additional work relative to these allowances will be authorized and instituted through the Change Order process. Any unused portion in whole or in part of the allowance shall be refunded to the Owner, also through the Change Order process.
 4. The Contractor's costs for unloading and handling at the site, overhead, profit and other expenses contemplated for the stated allowance amounts shall be included in its contract sum and not in the allowances.

1.02 RELATED WORK

- A. Refer to the related and associated divisions of the Project Manual and Specification for related additional or supplementary details and information.

1.03 CONTRACT DOCUMENTS

- A. Applicable provision of the Conditions of the Contract shall govern all work under this section.

1.04 ALLOWANCES

Allowance No. 1A

1. The General Contractor shall include in Base Bid GC-1 the sum of Fifteen Thousand Dollars (\$15,000) for unforeseen field conditions.

Allowance No. 2A

2. The General Contractor shall include in Base Bid GC-2 the sum of Forty-Five Thousand Dollars (\$45,000) for unforeseen field conditions.

Allowance No. 3A

3. The Mechanical Contractor shall include in Base Bid MC-1 the sum of Fifteen Thousand Dollars (\$15,000) for unforeseen field conditions.

Allowance No. 4A

4. The Electrical Contractor shall include in Base Bid EC-1 the sum of Fifteen Thousand Dollars (\$15,000) for unforeseen field conditions.

Allowance No. 5A

5. The Roofing Contractor shall include in Base Bid RC-1 the sum of Fifteen Thousand Dollars (\$15,000) for unforeseen field conditions.

Allowance No. 6A

6. The Roofing Contractor shall include in Base Bid RC-2a the sum of Fifty Thousand Dollars (\$50,000) for unforeseen field conditions.

Allowance No. 7A

7. The Roofing Contractor shall include in Base Bid RC-2b the sum of Thirty-Five Thousand Dollars (\$35,000) for unforeseen field conditions.

Allowance No. 8A

8. The Roofing Contractor shall include in Base Bid RC-3 the sum of Seventy-Five Thousand Dollars (\$75,000) for unforeseen field conditions.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01030 - SPECIAL PROCEDURES AND PROVISIONS

PART 1 - GENERAL

1.01 CONTRACTOR'S SUPERINTENDENT

- A. The Contractor must devote his time and personal attention to the work and shall employ and retain at the building from the commencement until the entire completion of the work a Contractor's Superintendent competent and capable of maintaining proper supervision and care of the work and acceptable to the Architect, who, in the absence of the Contractor and irrespective of any superintendent or foreman employed by any Subcontractor, shall see that the instructions of the Owner are carried out.
- B. The Contractor shall employ a competent senior superintendent. Such superintendent may not be replaced during the duration of the Project, including the completion of Punch List, unless approved by the Architect.
- C. The Contractor is to provide a resume of the Contractor's Superintendent to the Owner's Representative.
- D. The Contractor shall, at all times during the work, have a representative on site who communicates in English.

1.02 REPAIRING

- A. The Contractor shall do all repairing of work that becomes damaged by his workmen or the workmen of any of his subcontractors during the progress of his work or prior to its acceptance.
- B. All existing work that is damaged or disturbed during the alteration and finish work to the building shall be left in the condition as originally found.
- C. Any exterior areas damaged or disturbed by work of this Contract shall be properly repaired and left in sound condition and the premises shall be left clean and orderly.

1.03 CONTRACTOR'S RESPONSIBILITY

- A. The Contractor will be held responsible for all work and materials provided for by the plans and specifications until the work is completed and accepted. The Contractor will be held responsible also for any and all damages which may arise or occur to any party whomsoever by reason of work of this project, delivery and storing of materials, the opening or blocking of streets and walks or by neglecting to provide proper lights, guards, barriers, any other safeguards to prevent damage to property or injury to persons.

- B. Where openings cause exposure to outside elements, the Contractor shall provide necessary protection and coverings to prevent damage from frost or water.
- C. Provide and maintain temporary dustproof partitions to enclose spaces used by the Owner and relocate as required. Remove when no longer needed.
- D. The Contractor assumes responsibility for all injury to or destruction of or loss by theft or pilferage of the Contractor's materials, tools, machinery, equipment, appliances, shoring, scaffolding, false and form of work and personal property of his employees regardless of the cause.
- E. Each Contractor shall be responsible for their own material and equipment until completely installed, inspected for completeness and correctness, and signed off by the Architect or his duly appointed representative.
- F. 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.
- G. The cost/value of required repair/replacement of any non-conforming items as documented by the Architect's subject to inclusion in the Architects "Record of Unacceptable or Non-Conforming Work" and will be the subject of a fixed dollar amount of credit due to the Owner, prior to project closeout in enforcement of AIA Document A201, Item 12.3, "Acceptance of Non-Conforming Work". If the contractor delays resolution of non-conforming work, the fixed dollar amount of credit is subject to a proportional cost increase at the discretion of the Architect.
- H. 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.
- I. 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.
- J. 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.
- K. Before commencing any work, the Contractor shall verify all dimensions, coverage, and conditions prevalent at the job sites. If

no corrections are brought to the attention of the School District and the Engineer before starting installation, the Contractor will be totally responsible for the installation providing complete coverage of the area designated.

- L. For Additions to Existing Buildings: The General Contractor is responsible for correct finish floor alignment between existing building and proposed addition. At each finish floor, General Contractor shall utilize a licensed New York State surveyor to check all finish floor elevations shown for accuracy and shall be responsible for establishing said elevations prior to shop drawing submittal. The General Contractor's submission of steel and or concrete shop drawings shall contain said information and be the final basis for all other established elevations. The architect will accept said elevations as final, as the submission will include a licensed surveyor's certification of same.
- M. Upon completion of the work, the Contractor shall furnish as-built drawings showing the exact locations of every new item.
- N. It is assumed that Contractor's prices are based on scope of work complete and as confirmed by site(s) inspections prior to bidding.
- O. The Contractor shall be responsible for all incidental electric and plumbing work required to complete work under this Contract.
- P. 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.
- Q. Safety and Security during Construction Statements: Refer to Specification Section 01050, Uniform Safety Standards for School Construction and Maintenance Projects; Commissioner's Regulation, Section 155.5 - Items 3a through 3e.
- R. Additional Requirements of the Contractor:
 - 1. No drinking of alcoholic beverages or use of controlled substances allowed on the grounds. No reporting to work impaired by alcohol or controlled substances is allowed. The Contractor bears the responsibility of determining if its, or its subcontractors, employees are in any way impaired which would jeopardize the safety of the public, the employees of other Contractors and their Subcontractors, the Owner, Architect, and Construction Manager.

2. All Contractors are to refrain from conversing with school personnel and students. Any construction employees found doing so will be removed from the site.
 3. All Contractors are to refrain from using indecent language. All doing so will be removed from the site. Art work or decoration found on vehicles belonging to the Contractor's or Subcontractor's employees parked on or near the school property which contain indecent language or pictures shall either be covered or removed from the location.
- S. Separation of Construction Statement: Refer to Specification Section 01050, Uniform Safety Standards for School Construction and Maintenance Projects; Commissioner's Regulation, Section 155.5 - Item D.
1. A specific stairwell and/or elevator should be assigned for construction worker use during work hours. In general, workers may not use corridors, stairs, or elevators designated for students or school staff.
 2. Large amounts of debris must be removed by using enclosed chutes or a similar sealed system. There shall be no movement of debris through halls of occupied spaces of the building. No material shall be dropped or thrown outside the walls of the building.
 3. All occupied parts of the building affected by renovation activity shall be cleaned at the close of each workday. School buildings occupied during a construction project shall maintain required health, safety, and educational capabilities at all times that classes are in session.
- T. Fire Prevention: There is no smoking allowed anywhere on school property per New York State law. Violators are subject to a \$1,000 fine and/or banishment from the property.
1. Any holes in floors or walls should be sealed with a fire-resistant material.
- U. Construction Noise: Refer to Specification Section 01050, Uniform Safety Standards for School Construction and Maintenance Projects; Commissioner's Regulation, Section 155.5 - Item H.
- V. Construction Fume Control: Refer to Specification Section 01050, Uniform Safety Standards for School Construction and Maintenance Projects; Commissioner's Regulation, Section 155.5 - Item I.
- W. Off-Gassing Control: Refer to Specification Section 01050, Uniform Safety Standards for School Construction and Maintenance Projects; Commissioner's Regulation, Section 155.5 - Item J.

- X. Asbestos Code Rule 56: Refer to Specification Section 01050, Uniform Safety Standards for School Construction and Maintenance Projects; Commissioner's Regulation, Section 155.5 - Item K.
- Y. Asbestos TEM: Refer to Specification Section 01050, Uniform Safety Standards for School Construction and Maintenance Projects; Commissioner's Regulation, Section 155.5 - Item L.
- Z. Lead Abatement Projects: Refer to Specification Section 01050, Uniform Safety Standards for School Construction and Maintenance Projects; Commissioner's Regulation, Section 155.5 - Item M.

1.04 CLEANING

- A. Upon completion of all work, the Contractor shall be totally responsible for general site clean up and shall provide all labor and material required to thoroughly "broom clean" the premises throughout. This cleaning shall include, but not be limited to, the removal of all surplus material from all radiators, pipes, ducts, gypsum boards, metal work, woodwork, stairs, floors, ceilings, glass and other material and surfaces, and all surfaces which are finished shall be left in a clean and suitable condition.

1.05 REMOVAL OF TEMPORARY WORKS

- A. All temporary work such as guards, shoring, staging, etc., provided or erected by the Contractor shall be removed and shall become the property of the Contractor when such temporary work is no longer required, or when directed, or at completion of the contract.

1.06 MATERIALS, LABOR, TOOLS, WORKMANSHIP

- A. The Contractor will provide and furnish at his own expense any and all material, labor, scaffolding, tools, implements, molds, models, and cartage of every description necessary or proper to or for the duty and performance of said work and the faithful execution of his contract.

1.07 ORDERING OF SPECIFIED MATERIALS

- A. All specified materials are available from the manufacturers and some items require more time for delivery to the job than others. Therefore, to avoid the necessity of last minute substitutions because of late ordering, it will be the responsibility of the General Contractor to see that items that will require a substantial waiting period before delivery are ordered soon after the Contract is awarded.

1.08 SHUT-DOWNS

- A. The Contractor shall perform the work in a manner which will minimize shut-downs of existing operating items or systems. When the performance of the work requires the shut-down of an existing operation item or system, such shut-down shall take place only after the Contractor has given at least five working days notice and has obtained written authorization for the shut-down from the Owner. All shut-downs shall take place only on overtime, at no additional cost. This provision shall apply to all work, including testing of newly installed or altered systems.

1.09 DELIVERIES AND STORAGE

- A. All deliveries of materials or equipment must be done in conjunction with the Owner's representatives, to insure the least disruption of the facility. Storage of all materials must be approved by the Owner prior to delivery. The Owner will not accept any deliveries on

behalf of the Contractor. A Contractor's representative must be on site to accept such deliveries.

- B. Before attempting to deliver materials to the site, the Contractor shall inform the designated Owner's Representative so that arrangements can be made for places of entrance and inspection of materials being delivered.
- C. Storage of materials in the occupied building shall not be allowed unless otherwise agreed upon by the Owner's Representative. The Contractor shall be responsible for providing all storage trailers and security of same.

1.10 SPECIAL PROVISIONS

A. Contractor Representation at Construction Project Meetings:

- 1. Each Contractor shall provide qualified representation at all construction project meetings which will be held on a bi-weekly basis for the review of construction progress and coordination of all building trades. Failure of the Contractor to abide by these provisions may cause delays and incur additional expenses due to coordination difficulties.
- B. Any existing items (whether or not specified or shown on the drawings) requiring removal in order to properly complete the new work shall be removed by the Contractor performing the work and disposed of off-site at no additional charge to the Owner.
- C. Unless a specified item of removal, relocation, or installation (which appears to be in conflict with the actual site conditions) is brought to the attention of the Architect during the bidding period, the Contractor shall be responsible for the execution of said work and any related expenses incurred.
- D. Should any work or material be required which is not denoted in the Plans and Specifications, either directly or indirectly, but which is necessary for the proper execution of the intent thereof, it shall be understood and agreed that the same is implied and required and that the Contractor shall furnish all labor and material as if they were completely delineated and prescribed.
- E. Should a conflict occur between the drawings and specification and/or existing conditions, the Contractor shall be deemed to have estimated the more expensive way of accomplishing the work unless during the bidding period a clarification was requested by the Contractor and obtained in writing from the Architect, as to which method and material is to be used.
- F. Where, in these specifications, one certain kind, type, brand, or manufacture of material is named, it shall be regarded as the required minimum standard of quality and performance. Where two or more are named, these are presumed to be equal and the Contractor may select one of these items. If the Contractor desires to use any other kind, type, brand, or manufacture of material than those named in the specification, he shall submit information describing in

detail where it differs from base specifications and other information as required by the Owner.

The burden of proof of equivalence rests with the bidder. Adequate supporting information must accompany proposed substitution. The Owner or Architect reserves the right to accept or reject proposed substitutes.

- G. Any item shown on the plans but not specified or conversely specified but not shown on the plans, shall be treated as if shown or mentioned respectively in both.
- H. Alignment and adjustment of all erected steel shall be accomplished by a registered professional or land surveyor at the Contractor's expense and to the satisfaction of the Inspector.
- I. Inspection of all welded and high strength bolted field connections shall be accomplished by one of the following approved independent testing laboratories or an alternate testing company acceptable by the Owner. The Contractor shall arrange for and the Owner shall pay for all testing other than testing revealing failed results:
 - 1. All Island Testing.
 - 2. Soil Mechanics Environmental Services.
 - 3. Long Island Materials Testing Laboratories, Inc.
- J. Unless otherwise noted, each Contractor shall be responsible for their own cutting and rough patching. The General Construction Contractor shall be responsible for all finish patching and painting. 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.
- K. Each Contractor shall be responsible for their own material and equipment until completely installed, inspected for completeness and correctness, and signed off by the Architect or his duly appointed representative.
- L. The General Construction Contractor shall be the lead contractor, responsible for all coordination between the General Construction, Mechanical, and Electrical trades.
- M. The General Construction Contractor shall be responsible for cutting and patching all masonry work, insulated panels, etc. to accommodate any required thru-wall piping, conduit, equipment, or ductwork penetrations by other trades.

- N. The General Contractor shall be responsible for provision of any required temporary roof drainage, protective fencing, plywood enclosure of all window and door masonry openings, etc., until new construction or material is permanently and completely in place.
- O. The General Contractor shall provide and install all flashing, counterflashing, and pitch pockets for all roof equipment and roof penetrations and install all required roof curbs provided by others in accordance with the manufacturer's approved methods.

P. Changes to the Contract:

1. Should any changes be requested or required over and above the original contract scope, the Contractor shall be compensated as follows:
 - a. For the actual and reasonable net costs for all materials and wages of applied labor required for such extra work.
 - b. Rental costs for all machinery and equipment (other than small tools) required and approved for such extra work.
 - c. 10% overhead and 5% profit as compensation for all other items of profit and cost or expense, including administration, overhead, supervision, etc. (Contractor is limited to 5% overhead for work performed by his subcontractor on changes.)
 - d. A maximum of 2% for any increase in bonds and insurance's due to the adjusted contract sum.

Q. As is usual with capital project payments, the District will retain 5 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 work.

R. Contractor's proposals for any additional work (whether a field condition or program change) shall be submitted for consideration as follows:

1. Labor - Number of men
Wage per hours
Number of hours
2. Material - Unit costs (no lump sums)
Unit measure (l.f., s.f., cu.ft., etc.)
3. Rental costs for machine, equipment, driver, etc.
4. 2% for bonds and insurance.
5. Upon request, the Contractor shall furnish satisfactory proof of all labor performed, materials furnished, and equipment used in performance of the extra work.

S. Whenever inclement weather (rain, hail, sleet, snow, etc.) causes an interruption in the day to day execution of the Contract work, each Contractor must fully mobilize their forces (with the necessary manpower and equipment) to immediately continue with Contract operations the very first day that such weather has subsided.

1. Contractor shall provide all necessary excavation and dewatering equipment to remove any standing water from open holes, ditches, trenches, and other excavations.

- T. The maximum gross weight of vehicles used shall not exceed 2,500 lbs. per wheel in the area of any playground or ballfields. The equipment shall be fitted with flotation type tires. On lawns, the pounds per square inch exerted on the turf-grass shall not exceed 15 lbs. per square inch and on athletic areas shall not exceed 32 pounds per square inch.
- U. See attached "Record of Unacceptable or Non-Conforming Work".

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01050 - 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 01070 - 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 01085 - 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 Part 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

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01230 - 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.

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.

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01300 - SUBMISSIONS

PART 1 - GENERAL

1.01 SHOP DRAWINGS, PRODUCT DATA, MANUFACTURER'S WARRANTIES, AND SAMPLES:

- A. In addition to the requirements of General Conditions, Article 3.12, each Prime Contractor shall comply with the following wherever it applies to the work of his contract:
1. Prepare and submit, with construction schedule, a separate schedule for shop drawings, product data, and samples submittals, which shall be herein referred to as a "Submittal Log". This log shall list all required submittals specific to your trade as detailed in the various sections of the Project Specifications. Submittal log shall be submitted within one (1) calendar week of Notice to Proceed, before submitting first payment application. Submittal log shall show the following:
 - a. Section number.
 - b. Item of shop drawing, product data, and samples.
 - c. Date to be submitted.
 2. Shop drawings: Original drawing, prepared by Prime Contractor, subcontractor, supplier, or distributor, which illustrates some portion of the work; showing fabrication, layout, setting or erection details.
 - a. Identify details by reference to sheet and detail numbers shown on contract drawings.
 - b. Sheet size, multiple of 8-1/2" x 11", not to exceed size of contract drawings when unfolded.
 - c. Reproductions for submittals: One (1) reproducible transparency with seven (7) opaque diazo prints.
 - d. Photographic reproductions of contract drawings will not be accepted as shop drawings and will be rejected.
 3. Product Data:
 - a. Manufacturer's standard schematic drawings:
 1. Modify drawings to delete information which is not applicable.
 2. Supplement standard to provide additional information applicable to the project.
 - b. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data.

1. Clearly mark each copy to identify applicable materials products, or models.
 2. Show dimensions and clearances required.
 3. Show performance characteristics and capacities.
- c. Latest edition of manufacturer's applicable instructions and recommendations for installation of product.
4. Manufacturer's Warranties:
 - a. The Contractor shall include in his submissions samples of all manufacturer's warranties indicating the correct time duration of the warranty as specified in the contract documents. If the documents do not specify a specific time duration, the manufacturer's standard time duration shall apply, but in no event shall it be less than the contractor's guarantee as specified in Section 01700.
5. Samples: Physical examples to illustrate materials, equipment, or workmanship, and to establish standards by which completed work is judged.
 - a. Office samples to be sufficient size and quantity to clearly illustrate:
 1. Functional characteristics of product or material, with related parts and method of attachment.
 2. Full range of color samples.
 - b. Field samples and mock-ups, as specified in technical sections.
 1. Erect on project site at location acceptable to Architect/Engineer.
 2. Construct samples or mock-up complete, including work of all trades required in finish work.
6. The Architect refers to A.I.A. Document B141-1997, *Standard Form of Agreement Between Owner and Architect*, and has based the submittals procedure on said document.

1.02 PRIME CONTRACTOR RESPONSIBILITIES:

- A. All submissions are to be made directly to the Architect's office. Each Prime Contractor shall completely review, stamp, and sign his shop drawings, product data, and samples prior to submission to Architect. The Architect will not review any shop drawings unless first reviewed by Prime Contractor. Refer to 1.04G "Concurrent Submittals" for copies to be forwarded concurrently to the Construction Manager.

- B. Verify:
1. Field measurements.
 2. Field construction criteria.
 3. Catalog numbers and other data.
- C. Coordinate each submission with requirements of work and contract documents. Prime Contractor shall exercise professional judgement to adequately address time gaps between submissions, Architect's/Engineer's review time, resubmission time, fabrication, procurement and long-lead purchases, and on-site priorities which dictate installation times.
- D. Each Prime Contractor will be responsible to send all shop drawings and technical submittals to the Architect's office via Federal Express Overnight Priority Delivery, or other comparable delivery services.
- E. Each Prime Contractor is responsible to supply the proper number of copies for all submissions, including samples, color boards, etc. The Architect has the right to reject and return any submissions made which do not conform to the requirements indicated herein.
- F. Prime Contractor's responsibility for errors and omissions in submissions is not relieved by Architect/Engineer's review of submissions.
- G. Prime Contractor's responsibility for deviations in submissions from requirements of contract documents is not relieved by Architect/Engineer's review of submissions unless Architect/Engineer gives written acceptance of specific deviations.
- H. All submissions shall be accompanied by a **Letter of Transmittal**, signed by the Prime Contractor's project manager. Notify Architect/Engineer, in writing at time of submission of deviations in submissions from requirements of contract documents. In addition, all submittals shall be accompanied by a signed and dated "**Submittal Cover Sheet**" for each item, which acknowledges the Prime Contractors review for completeness, correctness and accuracy of each submitted item.
- I. No portion of the work requiring submissions shall be started, fabricated, or installed until return of approved submissions to the prime contractor.
- J. After Architect review, distribute copies of submissions to parties requiring same for coordinating of work.
- K. Make required copies for distribution of shop drawings, and product data, that has been stamped and signed by the Architect.

1.03 CONTRACTOR PREPARATION, REVIEW, AND SUBMISSION 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.
- B. It is the responsibility of the Prime Contractor, to coordinate such field verification and be ultimately responsible for the accuracy of same prior to the submission of shop drawings for design intent review by the Architect/Engineer.
- C. All submittals of shop drawings, materials, samples, etc. prepared by any subcontractor and/or supplier of the Prime Contractor or by the Prime Contractor themselves shall be reviewed by the Prime Contractor, prior to the submission of same to the Architect/Engineer, for: contract document accuracy and 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 such review as stated in 1.03C above, the Prime Contractor shall signify same 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.
 - Signature of reviewer.
 - Name of reviewer (printed).
 - Title of reviewer (printed).
- E. In compliance with 1.03D above, the Prime Contractor shall submit in writing to the Architect/Engineer and Owner's representative (if any), prior to their first submission, the name and title of the reviewer who shall be an employee of the Prime Contractor for review and acknowledgment of same.
- 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 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.
- G. Any resultant construction field condition that arises that is contrary to a 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 make known to the Owner's Representative, and, 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 associated costs to accomplish same shall be the sole responsibility of the Prime Contractor found negligent in causing such conditions.

- H. No submission to the Architect/Engineer shall contain or utilize directly portions whole or in part of the contract documents, such as the reproduction of drawings, portions of the Project Manual, etc.
- I. The Architect's office reserves the right to retain any submitted technical data and shop drawings in abeyance if: submissions are incomplete, improper number of samples are submitted, if submissions are not accompanied by a properly-executed submittal cover sheet/letter of transmittal, or until all associated/interrelated shop drawings or interrelated technical data are submitted. See "K" below.
- J. Any submission not containing the information outlined and required in 1.03D above will not be reviewed by the Architect/Engineer for design intent, but rather rejected and sent back to the Prime Contractor for review by same.
- K. Any submission by the Prime Contractor that requires 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/Engineer may be rejected in whole or part by the Architect/Engineer, 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/Engineer. Any release given any entity other than the Architect/Engineer to fabricate, furnish, and install any material or system not reviewed by the Architect/Engineer for design intent shall become the sole responsibility of the releasing entity as well as the resolution of construction related issues or conflicts.
- L. In addition, the Prime Contractor shall not utilize nor refer to any schedule of work not created nor provided by the Architect/Engineer. 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.
- M. 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.

- N. The Architect is not legally bound to the approved construction schedule; only the Prime Contractors are bound to the approved construction schedule. The Architect is not required to expedite reviews or comments in the effort to expedite any Prime Contractors' submissions and/or construction schedule.

1.04 SUBMISSION REQUIREMENTS:

- A. Submit eight (8) copies of product data.
- B. Submit one (1) reproducible transparency (sepia) and seven (7) prints.
- C. Submit three (3) samples specified in each technical section.
- D. All specification/product data catalogue cuts submitted by the Prime Contractor(s) to the Architect's office for approval and processing shall be accompanied by a signed and dated "Submittal Cover Sheet", which shall acknowledge the Prime Contractor's receipt, completeness and correctness of the submitted material. A Letter of Transmittal shall accompany all submissions, and it shall contain:
1. Date of submission.
 2. Architect/Engineer's project title and project number (include all extensions).
 3. Attention of: name of Architect's designated project representative.
 4. Prime Contractor's name and address.
 5. Notification of deviations from contract documents.
 6. Any additional pertinent data.
- E. Submissions shall include:
1. Date and revision dates.
 2. Architect/Engineer's project title and number.
 3. The Names of:
 - a. Architect/Engineer.
 - b. Prime Contractor.
 - c. Subcontractor.
 - d. Supplier.
 - e. Manufacturer.
 4. Identification of product.

5. Relation to adjacent structure or materials.
 6. Field dimensions, clearly identified as such/
 7. Technical specification section number.
 8. Applicable standards.
 9. A blank space 4" x 4", for the Architect/Engineer's stamp.
 10. Identification of deviations from contract documents.
 11. Prime Contractor's stamp, initialed or signed, certifying to review of submission, verification of field measurements and compliance with contract documents.
- F. Catalog Data:
1. Submit catalog data with a "Catalog Data" cover sheet with information as listed in paragraph 1.03, F., above.
- G. Concurrent Submittals: In addition to submitting the above to the Architect's office, the Prime Contractor will also send, concurrently, one (1) copy of drawing/cuts simultaneously to the Construction Manager.

1.05 RESUBMISSION REQUIREMENTS:

- A. Shop Drawings:
1. Revise initial drawings as required and resubmit as specified for initial submission.
 2. Indicate on drawings any changes which have been made other than those requested by the Architect/Engineer.
- B. Product Data and Samples:
1. Submit new data and samples as required for initial submission.

1.06 DISTRIBUTION OF SUBMISSIONS:

- A. Prime Contractor shall distribute copies of shop drawings, product data, and/or samples which carry the Architect/Engineer approval stamp to:
1. Prime Contractor's file (as required).
 2. Job site file (as required).
 3. Record document file (as required).
 4. Other prime contractors, as required for coordination (as required).
 5. Subcontractor (as required).

- 6. Suppliers and Fabricators (as required)
- 7. The Construction Manager (2 copies).
- B. Distribute samples as directed, by Architect/Engineer.
- C. The Prime Contractor will be responsible for the distribution of their approved drawings/cuts in a timely manner to other Prime Contractors (and subcontractors) for coordination with their work. Any additional costs generated due to the lack of transfer information will be borne by the Prime Contractor responsible for distribution. In the event the Prime Contractor fails to distribute shop drawings/product information to other Prime Contractors (and their subcontractors), the Owner reserves the right to have the Architect make the necessary copies and Federal Express to the parties involved. All costs incurred by the Architect will be back-charged to the Prime Contractor responsible for not distributing the shop drawings/product information. The Prime Contractors are responsible for coordinating their own work with the work of other Prime Contractors and/or their subcontractors.
- D. Shop drawings/submittals returned to the Prime Contractors for second resubmission will require a two (2) day turnaround on resubmission. Submittals requiring a second resubmission will result in charges for additional Architect/Engineer review time. All returned shop drawings must be sent Federal Express Overnight Priority Delivery.

1.07 ARCHITECT/ENGINEER:

- A. Review for:
 - 1. Design concept of project.
 - 2. Compliance with contract documents.
- B. Review of separate items does not constitute review of an assembly in which item functions.
- C. Stamp and initial or sign to review of submission.
- D. Return submissions to Prime Contractor for distribution.
- E. Note: Based upon the amount of multiple submittals received in one day, and their content, *unless they are specifically numbered by the Prime Contractor for their order of relative importance* on his Letter of Transmittal, the Architect shall establish the level of importance of each submittal, and shall be allowed sufficient time (in the Architect's professional judgement) to permit adequate review. Such submissions 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. As a result of multiple/sequential submissions, 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 adequate review from the Architect's office.

- F. Architect's Stamp: The Architect's stamp (indicating initials and date), affixed to any shop drawing, manufacturer's specification cut or sample is only for design concept conformance, and general compliance with the content of the contract documents. This does not relieve the Prime Contractor of his/her responsibility to comply with the requirements of the Contract Documents.

1.08 TIME FOR SUBMISSION:

- A. The Prime Contractor unless otherwise directed by the Architect, shall submit to the latter for approval all shop drawings, product data, and samples as specified above.

Within 2 weeks of Notice to Proceed, the following submittals shall be sent:

<u>Section</u>	<u>Description</u>	<u>Item</u>
1A	Schedules & Reports	Plan of Operations & Progress Schedules
1C	Insurance Requirements	Certificates of Insurances
1D	Product Approval Standard	Notification Letter to EPA - Dump Receipt & Waste Manifest, NYS Labor Dept & EPA-AHERA Certificates
01015	Project Schedule	Contractor's Project Schedule, reflecting critical milestones & completion dates
01020	Allowances	N/A
01030	Special Procedures and Provisions	Written Guarantee of complete installation(s), As-Built drawings, equivalency requirements.
01050	Uniform Safety Standards for School Construction and Maintenance Projects - Commissioner's Regulations	N/A
01070	Abbreviations and Symbols	N/A
01085	Applicable Standards	N/A
01230	Construction Phase Clarifications	Weekly RFI Logs during construction
01300	Submissions	this Section
01500	Construction Facilities & Temporary Controls	Staging Plans, Temporary Partitions Layout
01550	Selective Demolition	Methods & Operations Sequence Schedule, Demolition & Removals sequencing
01610	Asbestos Abatement	Contractor Quality Assurance Items 1-4, Valid Asbestos Handling License, Proof of EPA-Accreditation for Response Actions (submitted w/ Bid) Notification Letter to EPA - Dump Receipt & Waste Manifest, NYS Labor Dept & EPA-AHERA Certificates, Log Book, Waste Manifests, Dump Receipts, Employee Protection Plan, OSHA Medical Monitoring, Respiratory Training and Protection Plan, copies of all inspection & permit certifications.
01611	Test Laboratory Services	Laboratory Approval & Qualifications per 1.05A; Analysis of Contaminated Fillers via NIOSH Method, using Phase Contract Microscopy; Test Results
01612	Methods of Removal & Temporary Enclosures	Room Inspection Reports; Submission of Asbestos Caution Signs & Text, Written Emergency Procedures, Detail on Temporary Walls
01613	Asbestos Removal	N/A
01614	Air Monitoring	Air Monitoring Test Results; Daily Logs from Safety Monitor
01615	Project Decontamination	Air Maintain Test Results
01616	Clean-Up Procedures	N/A
01617	Monitoring & Supervision	Air Sampling & Analysis Data Results (per 1.04); Post Removal Test Results
01618	Removal of Asbestos	Refer to 1.11 - Submittals of Section 02080

Contaminated Substrate Material
- Manual Scrape Method

01700	Contract Closeout	Contractor's Notice of Substantial Completion, Contractor's Punchlist, Final Inspection Notice, O&M manuals, Contract Closeout Documents, As-Built, Guarantees
01710	Final Cleaning	N/A
01720	Project Record Documents	Project Record Documents at project completion
02000	Site Work Overview	Alternate / Additional Design Criteria
04100	Mortars	Technical Data (materials), Design Mix, pigment samples
04200	Unit Masonry	Technical Data, Fire Performance Data, Field Mock-ups, Unit Samples, Accessories Samples
04202	Glazed Masonry Units	Technical Data, Certifications, test reports, full-size samples, Sample Mock-ups
04206	Flagstone Restoration and Mortar Joint Tuckpointing	Technical Data, Certifications, Samples
04252	Masonry Thin Brick Veneer	Technical Data, Certifications, Samples, Mock-Ups
04270	Glass Unit Masonry	Technical Data, Certifications, test reports, full-size samples, Sample Mock-ups
04400	Belgian Block	Technical Data, Shop Drawings, Samples
04430	Simulated Masonry	Technical Data, Shop Drawings, Samples
04435	Cast Stone	Technical Data, Shop Drawings, Samples
04500	Masonry Restoration & Cleaning	Technical Data, Samples
04502	Masonry Surface Cleaning	Technical Data on application, equipment & materials
04720	Cast Stone	Technical Data, Shop Drawings, Samples, Applicable Experience

<u>Section</u>	<u>Description</u>	<u>Item</u>
1A	Schedules & Reports	Plan of Operations & Progress Schedules
1C	Insurance Requirements	Certificates of Insurances
1D	Product Approval Standard	Notification Letter to EPA - Dump Receipt & Waste Manifest, NYS Labor Dept & EPA-AHERA Certificates
01010	Work Under This Contract (Asbestos)	NYSLD & EPA-AHERA certificates, Log Book, Waste Manifests, Dump Receipts, Employee Protection Plan, OSHA Medical Monitoring, Respiratory Training and Protection Plan, copies of all inspection & permit certifications.
01015	Project Schedule	Contractor's Project Schedule, reflecting critical milestones & completion dates
01020	Allowances	N/A
01030	Special Procedures and Provisions	Written Guarantee of complete installation(s), As-Built drawings, equivalency requirements.
01050	Uniform Safety Standards for School Construction and Maintenance Projects - Commissioner's Regulations	N/A
01070	Abbreviations and Symbols	N/A
01085	Applicable Standards	N/A
01230	Construction Phase Clarifications	Weekly RFI Logs during construction
01300	Submissions	this Section
01500	Construction Facilities & Temporary Controls	Staging Plans, Temporary Partitions Layout
01550	Selective Demolition	Methods & Operations Sequence Schedule, Demolition & Removals sequencing
01610	Asbestos Abatement	Contractor Quality Assurance Items 1-4, Valid Asbestos Handling License, Proof of EPA-Accreditation for Response Actions (submitted w/ Bid) Notification Letter to EPA - Dump Receipt & Waste Manifest, NYS Labor Dept & EPA-AHERA Certificates, Log Book, Waste Manifests, Dump Receipts, Employee Protection Plan, OSHA Medical Monitoring, Respiratory Training and Protection Plan, copies of all inspection & permit certifications.
01611	Test Laboratory Services	Laboratory Approval & Qualifications per 1.05A; Analysis of Contaminated Fillers via NIOSH Method, using Phase Contrast Microscopy; Test Results
01612	Methods of Removal & Temporary Enclosures	Room Inspection Reports; Submission of Asbestos Caution Signs & Text, Written Emergency Procedures, Detail on Temporary Walls
01613	Asbestos Removal	N/A
01614	Air Monitoring	Air Monitoring Test Results; Daily Logs from Safety Monitor
01615	Project Decontamination	Air Maintain Test Results
01616	Clean-Up Procedures	N/A

01617	Monitoring & Supervision	Air Sampling & Analysis Data Results (per 1.04); Post Removal Test Results
01618	Removal of Asbestos Contaminated Substrate Material - Manual Scrape Method	Refer to 1.11 - Submittals of Section 02080
01700	Contract Closeout	Contractor's Notice of Substantial Completion, Contractor's Punchlist, Final Inspection Notice, O&M manuals, Contract Closeout Documents, As-Builts, Guarantees
01710	Final Cleaning	N/A
01720	Project Record Documents	Project Record Documents at project completion
02000	Site Work Overview	Alternate / Additional Design Criteria
04100	Mortars	Technical Data (materials), Design Mix, pigment samples
04200	Unit Masonry	Technical Data, Fire Performance Data, Field Mock-ups, Unit Samples, Accessories Samples
04202	Glazed Masonry Units	Technical Data, Certifications, test reports, full-size samples, Sample Mock-ups
04206	Flagstone Restoration and Mortar Joint Tuckpointing	Technical Data, Certifications, Samples
04252	Masonry Thin Brick Veneer	Technical Data, Certifications, Samples, Mock-Ups
04270	Glass Unit Masonry	Technical Data, Certifications, test reports, full-size samples, Sample Mock-ups
04400	Belgian Block	Technical Data, Shop Drawings, Samples
04430	Simulated Masonry	Technical Data, Shop Drawings, Samples
04435	Cast Stone	Technical Data, Shop Drawings, Samples
04500	Masonry Restoration & Cleaning	Technical Data, Samples
04502	Masonry Surface Cleaning	Technical Data on application, equipment & materials
04720	Cast Stone	Technical Data, Shop Drawings, Samples, Applicable Experience

Within 4 weeks of Notice to Proceed, the following submittals shall be sent:

<u>Section</u>	<u>Description</u>	<u>Item</u>
02200	Earth Work	Sheetpiling, bracing and shoring details, certified by a NYS Professional Engineer. Shop Drawings, Details, Technical Data, Written Confirmation of all Easements
02270	Sediment and Erosion Control Procedures and Requirements	Temporary and Permanent Sediment and Erosion Control Schedule; Waste Material Disposal Plan
02350	Timber Piles	NYSPE-certified Pile Driving Log, NYSLS-certified As-Driven Pile Location Plan
02400	Storm Water Drainage, Structure and Castings	Technical Data, Materials Certification, Shop Drawings
02410 & 02411	Sand Slit Drainage Systems	5-Year Experience & References
02452	Grounds, Traffic & Parking Signs	Fabrication and Installation Drawings
02486	Synthetic Turf	Shop Drawings, Product Data, Sample Warranty, Credentials
02542	Playground Surfacing System (Wood Fiber)	Technical Data, Warranty
02543	Playground Surfacing System (Poured Rubber)	Technical Data, Warranty
02544	Playground Surfacing System (Rubber Tiles)	Technical Data, Warranty
02501	Reinforced Concrete Piping	SCDPW Class IV Certification
02504	Cleaning Existing Storm Water Drainage Systems	N/A
02506	Abandonment of Existing Sanitary and Storm Water Systems	Copies of Submittals to SC Dept. of Health Services
02519	Segmented Retaining Wall Units	Technical Data, Shop Drawings, Warranty
02531	Tennis Court Surfacing	Material Certificates, MSDS Data, Manufacturer Approval of Installer, Technical Data, Samples
02536	Track & Field Event Surfacing (Urethane)	Material Certificates, MSDS Data, Manufacturer Approval of Installer, Technical Data, Samples
02537	Cinder Running Track Reconstruction	Technical Data
02577	Pavement Marking	Technical Data, Compliance Letter from Manufac.
02578	Thermoplastic Pavement Markings	Technical Data, Letter of Compliance with SCDPW Item 685
02579	Pre-Formed Reflectorized Pavement Markings	Technical Data, Letter of Compliance with SCDPW Item 685
02600	Hot Mix Asphalt Pavement System	Technical Data, Plant Certification
02601	Asphalt Overlay	Technical Data, Plant Certification

02604	Pavement Crack Sealing	Technical Data
02602	Asphalt Repair	Technical Data
<u>Section</u>	<u>Description</u>	<u>Item</u>
02603	Asphalt Sealing	Technical Data
02660	Water & Sanitary Systems	Technical Data, Trade Designations
02702	Ballfield Renovation	Technical Data, Shop Drawings, Samples
02711	Subsurface Drainage System	Technical Data, Samples
02734	Irrigation Well Pump	Technical Data, Copies of permits & test results
02800	Site Amenities	Technical Data, Shop Drawings, Samples
02801	Topsoil, Lawns & Grasses	Technical Data, Seed Mixture
02810	Irrigation System	Technical Data, Installation Instructions
02820	Exterior Athletic Equipment & Backstops	Technical Data, Shop Drawings, Samples
02831	Galvanized Chain Link Fencing	Technical Data, Shop Drawings, Samples
02832	Vinyl Coated Chain Link Fencing	Technical Data, Shop Drawings, Samples
03300	Cast In Place Concrete	Technical Data, Shop Drawings, Design Mix, Test Reports, Material Certificates, Concrete Testing Lab
03310	Concrete Work	Technical Data, Shop Drawings, Samples, Test Reports, Material Certificates, Testing Lab
03311	Concrete Curb	Technical Data, Shop Drawings, Samples, Test Reports, Material Certificates, Concrete Testing Lab
03312	Concrete Sidewalk	Technical Data, Shop Drawings, Samples, Test Reports, Material Certificates, Concrete Testing Lab
03318	Driveway Aprons	Technical Data, Shop Drawings, Design Mix, Test Reports, Material Certificates, Testing Lab
03412	Precast Concrete Roof Plank	Technical Data
03450	Architectural Precast Concrete	Technical Data, Shop Drawings, Samples
03500	Tectum Roof Deck	Technical Data, Samples
03511	Self-Leveling Concrete Floor Underlayment	Technical Data
03512	Self-Leveling Concrete Floor Underlayment (over Extruded Polystyrene Foam)	Technical Data
03650	Underlayment Concrete	Technical Data, Manufacturers Certifications
03710	Concrete Cleaning	Cleaning Procedure, Dust, Dirt & Debris Containment Plan
03720-1	Concrete Resurfacing (Rebar Primer)	Manufacturer's Guarantees, Technical Data, Samples

03720-2	Concrete Resurfacing (Repair Mortar)	Manufacturer's Guarantees, Technical Data, Samples
03720-3	Concrete Resurfacing (Finish Coating)	Manufacturer's Guarantees, Technical Data, Samples
03720-4	Concrete Resurfacing (Repair Mortar)	Manufacturer's Guarantees, Technical Data, Samples

<u>Section</u>	<u>Description</u>	<u>Item</u>
05030	Metal Finishes	Technical Data, Material Certifications
05120	Structural Steel	Technical Data, Shop Drawings, Test Reports, Surveys, templates
05210	Steel Joists and Girders	Technical Data, Shop Drawings, Welders Certificates
05300	Metal Decking	Technical Data, Shop Drawings, Insurance Certification, templates
05400	Cold Formed Metal Framing	Technical Data, Shop Drawings, templates
05500	Metal Fabrication	Technical Data, Shop Drawings, templates
05510	Miscellaneous Metal	Technical Data, Shop Drawings, Samples
05512	Wrought Iron Malleable Railings	Technical Data, Shop Drawings, Samples
05514	Metal Railings	Technical Data, Shop Drawings, Samples
05515	Ornamental Metal Work (Aluminum)	Technical Data, Shop Drawings
05530	Prefabricated Expansion Joint Covers	Technical Data, Shop Drawings
05580	Arch Metal Column Covers	Technical Data, Shop Drawings
05800	Expansion Joint Covers	Technical Data, Shop Drawings
06100	Rough Carpentry	Material Certificates, Treatment Data
06170	Prefabricated Structural Wood	NYSPE-prepared Design Calculations, Shop Drawings, Technical Data
06200	Finish Carpentry	Technical Data, Shop Drawings
06204	Wood Veneer Cabinetry	Technical Data, Shop Drawings, Samples
06208	Wood Raised Panel	Technical Data, Shop Drawings
06600	Fiber-Reinforced Polymer	Technical Data, Shop Drawings, Samples
07012	Work Included (Urethane Roofing)	Technical Data, Applicator's Licenses & Proof of Applicable Experience, warranties
07013	Codes, Standards and Permits (Urethane Roofing)	Required Operations and Permits, Tests and Inspections
07140	Metal Oxide Waterproofing	Technical Data, Shop Drawings
07160	Bituminous Dampproofing	Technical Data, Shop Drawings
07161	Subsurface Drainage System	Technical Data, Shop Drawings, Samples
07180	Water Repellents	Technical Data, Shop Drawings, Samples
07190	Underslab Vapor Barrier	Technical Data

07191	Polyethylene Vapor Barrier (Relocatable Classrooms)	Technical Data
07200	Building Insulation	Technical Data, Certified Test Reports
07210	Fireproofing Insulation	Technical Data, Certified Test Reports
07219	Preformed Masonry Insulation	Technical Data, Full Sized Samples
07240	Exterior Insulation and Finish Systems	Technical Data, Shop Drawings, Certificate of Applicator Approval, Samples (Color & Texture)

<u>Section</u>	<u>Description</u>	<u>Item</u>
07241	Direct Applied Exterior Finish Systems	Technical Data, Shop Drawings, Certificate of Applicator Approval, Samples (Color & Texture)
07255	Cementitious Fireproofing	Technical Data, Testing Data, Thickness Schedule
07310	Asphalt Shingles (New Installation-Grand Manor)	Technical Data, Samples, Warranty
07312	Asphalt Shingles	Technical Data, Samples, Warranty
07315	Asphalt Shingles (over existing)	Technical Data, Samples, Warranty
07323	Shingle and Roofing Tiles	Technical Data, Samples, Warranty
07324	Slate Roofing Shingles	Technical Data, Samples, Warranty
07325	Slate Shingles	Technical Data, Samples, Warranty
07326	Slate Shingle Replacement	Technical Data, Samples, Warranty
07410	Concealed Fastener Metal Wall and Soffit Panels	Technical Data, Shop Drawings
07415	Adjust-a-Web Framing System	Technical Data, Shop Drawings, NYSPE-Certified Structural Calculations
07420	Cement Board Wall and Soffit Panels	Technical Data, Shop Drawings
07460	Vinyl Siding	Technical Data, Samples
07520	2001 Kelly Roofing Membrane	Technical Data, Shop Drawings, UL & FM Compliance Data, Tapered Insulation Drawings, Installer's Certifications
07531	Elastic Sheet Roofing (wood deck)	Technical Data, Shop Drawings, Tapered Insulation Drawings, Labor & Material Guarantee
07532	Elastic Sheet Roofing (Vented) (Non-combustible Deck)	Technical Data, Shop Drawings, Tapered Insulation Drawings, Labor & Material Guarantee
07534	SBS Modified Bitumen Roofing (Mop - Torch)	Technical Data, Shop Drawings, Tapered Insulation Drawings, UL/FM Compliance Data, Certifications
07535	SBS Modified Bitumen Roofing (Mop - Mop)	Technical Data, Shop Drawings, Tapered Insulation Drawings, UL/FM Compliance Data, Certifications
07536	Heat-Welded Modified Bitumen Roofing	Technical Data, Shop Drawings, Tapered Insulation Drawings, UL/FM Compliance Data, Certifications

07537	4-Ply Built-Up Roofing/ Modified Bitumen System	Technical Data, Shop Drawings, Tapered Insulation Drawings, UL/FM Compliance Data, Certifications
07540	Urethane / Silicone Elastomeric Roofing	Technical Data, Shop Drawings, Samples
07541	Urethane / Silicone Elastomeric Roofing Recoat	Technical Data, Shop Drawings, Samples
07545	Metal Roofing System	Technical Data, Shop Drawings, Samples
07550	Fully Adhered Roofing System	Technical Data, Shop Drawings, Samples
07600	Flashing & Sheet Metal	Technical Data, Shop Drawings, Samples
07601	Flashing and Sheet Metal (Met Fab Manuf.)	Technical Data, Shop Drawings, Samples
<u>07602</u> <u>Section</u>	<u>Flashing</u> <u>Description</u>	<u>Technical Data, Shop Drawings, Samples</u> <u>Item</u>
07604	Lead Coated Copper Flashing and Sheet Metal	Technical Data, Shop Drawings, Samples
07605	Terne Coated Stainless Steel Flashing and Sheet Metal	Technical Data, Shop Drawings, Samples
07606	Copper Louvers	Technical Data, Shop Drawings, Samples
07632	PVC Roof Drain and Drain Pipe Removal	Technical Data, Shop Drawings
07634	Lead Coated Copper Gutters and Downspouts	Technical Data, Shop Drawings, Samples
07635	Aluminum Gutters & Downspouts	Technical Data, Shop Drawings, Samples
07710	Retrofit Insert Drains	Technical Data, Shop Drawings, Samples
07715	Prefabricated Metal Fascia & Soffit Panels	Technical Data, Shop Drawings, Samples
07800	Roof Accessories	Technical Data, Shop Drawings, Samples
07830	Roof Scuttle	Technical Data, Shop Drawings, Finish Samples
07900	Caulking	Technical Data, Certifications, Test Reports
07910	Joint Sealers	Technical Data, Certifications, Test Reports
07920	Preformed Joint Sealers	Technical Data, Samples
08110	Steel Doors and Frames	Technical Data, Shop Drawings, Samples, Certifications
08120	Aluminum Doors and Frames	Technical Data, Shop Drawings, Finish Samples, Associated Hardware Schedule
08121	FRP Doors and Framing	Technical Data, Shop Drawings, Finish Samples, Associated Hardware Schedule
08211	Flush Wood Doors	Technical Data, Shop Drawings, Finish Samples
08261	Wood French Door Assembly	Technical Data, Samples, Certificates, Finish Samples
08306	Fire Rated Access Doors	Technical Data, Shop Drawings, Finish Samples
08330	Roll Up Coiling Fire Doors	Technical Data, Shop Drawings, Finish Samples

08331	Roll-up Overhead Doors	Technical Data, Shop Drawings, Finish Samples
08360	Upward Acting Sectional Doors	Technical Data, Shop Drawings, Finish Samples
08410	Aluminum Entrances and Storefronts	Technical Data, Shop Drawings, Finish Samples Manufacturers Certification, QC/Performance Results
08520	Aluminum Windows (Dual Glazed - EFCO)	Technical Data, Shop Drawings, Samples, Manufacturers Certification, QC/Performance Results
08522	Aluminum Windows (Dual Glazed - Litex)	Technical Data, Shop Drawings, Samples, Manufacturers Certification, QC/Performance Results
08523	Window Repair	Technical Data, Shop Drawings
08524	Aluminum Windows (Dual Glazed - Graham)	Technical Data, Shop Drawings, Samples, Manufacturers Certification, QC/Performance Results
08526	Aluminum Windows (Dual Prime Horizontal Slider - Litex)	Technical Data, Shop Drawings, Samples, Manufacturers Certification, QC/Performance Results

<u>Section</u>	<u>Description</u>	<u>Item</u>
08528	Aluminum Windows (Dual Double Hung)	Technical Data, Shop Drawings, Samples, Manufacturers Certification, QC/Performance Results
08630	Vinyl Sheath Double Hung Wood Windows (Andersen)	Technical Data, Shop Drawings, Samples, Manufacturers Certification, QC/Performance Results
08631	Aluminum Clad Wood Windows (Marvin)	Technical Data, Shop Drawings, Samples, Manufacturers Certification, QC/Performance Results
08632	New Aluminum Clad Wood Windows (Marvin)	Technical Data, Shop Drawings, Samples, Manufacturers Certification, QC/Performance Results
08640	Self-Flashing Polycarbonate Unit Skylights	Technical Data, Shop Drawings, Samples
08710	Finish Hardware	Technical Data, Hardware Schedule, Final Hardware Schedule Content, Keying Schedule, Samples, Templates
08711	Aluminum Storm Doors	Technical Data, Shop Drawings
08712	Aluminum Insect Screens	Technical Data, Shop Drawings
08722	Door Operator	Technical Data, Shop Drawings, Samples
08760	Window Hardware and Specialties	Technical Data, Shop Drawings
08800	Glass and Glazing	Technical Data, Shop Drawings, Samples
08806	Fire Rated Glazing (FireLite)	Technical Data, Shop Drawings, Samples
08807	Oversized Fire Rated Glazed Assemblies (VL3000)	Technical Data, Shop Drawings, Samples
08808	Fire Rated Wire Glazing	Technical Data, Shop Drawings, Samples
08920	Glazed Aluminum Curtain Walls (EFCO)	Technical Data, Shop Drawings, QC/Performance Results, Closeout Submittals
08922	Glazed Aluminum Curtain Wall System (US Aluminum Corp. Series 3200)	Technical Data, Shop Drawings, QC/Performance Results, Closeout Submittals

08924	Glazed Aluminum Curtain Walls (Litex)	Technical Data, Shop Drawings, QC/Performance Results, Closeout Submittals
08930	Metal Glazing Panels (1/4" Porcelain Enamel Panels)	Technical Data, Shop Drawings, Samples
08950	Insulated Translucent Panel System	Manufacturer's & Erectors Qualifications, Shop Drawings, Color Samples, Test Reports per 1.03B, Quality Control per 1.03, Energy Calculations per 1.03
08951	Insulated Translucent Panel Skylight System	Technical Data, Shop Drawings, Color Samples, Test Reports per 1.03B, Quality Control per 1.03, Energy Calculations per 1.03
09102	Plaster (over CMU-Interior)	Technical Data, Sample Panels
09210	Stucco Plaster (on CMU at Exterior)	Technical Data, Sample Panels
09220	Surewall Fiber Reinforced Plaster System (FRP)	Technical Data, Sample Panels
09221	Lath and Cement Plaster (Stucco)	Technical Data, Sample Panels
09250	Gypsum Wallboard	Technical Data, Samples

<u>Section</u>	<u>Description</u>	<u>Item</u>
09255	Vinyl Coated Gypsum Wallboard Panels	Technical Data with Specified Compliances, Samples, Shop Drawings, Engineering Calculations
09290	Gypsum Fabrication	Technical Data, Samples
09300	Ceramic Tile	Technical Data, Samples
09400	Terrazzo Flooring	Technical Data, Samples
09410	Thin-Set Epoxy Terrazzo Flooring	Technical Data, Samples, System Data, Installer's Experience
09425	Terrazzo Tile	Technical Data, Samples
09500	Acoustical Wall Panels	Technical Data, Samples
09510	Acoustic Ceiling System	Technical Data, Samples
09511	Sprayed Acoustical Applications	Technical Data, Samples, Test Reports, Applicator Certifications
09512	Acoustical Ceiling Tile / Grid Restoration	Technical Data, Samples
09513	Metal Ceiling Systems	Technical Data, Samples, Maintenance Instructions
09514	Fiberglass Ceiling Grid System	Technical Data, Samples, Maintenance Instructions
09515	Acoustical Tile Coating	Technical Data, Samples, Maintenance Instructions
09550	Wood Flooring	Technical Data, Samples
09563	Wood Athletic Flooring (Conner "Duracushion III")	Technical Data, Samples
09565	Wood Athletic Flooring (Robbins "Locktite")	Technical Data, Samples
09567	Wood Athletic Flooring (Conner "Perma-Lock")	Technical Data, Samples

09569	Wood Athletic Flooring (Conner "Neo-Shok")	Technical Data, Samples
09570	Wood Flooring (Refinishing)	Technical Data
09650	Resilient Flooring	Technical Data, Samples
09651	Rubber Stair Treads	Technical Data, Samples
09666	Ribbed Rubber Matting	Technical Data, Shop Drawings, Samples
09680	Carpeting	Technical Data, Shop Drawings, Samples
09770	Indoor Athletic Surfacing	Technical Data, Samples
09772	Vinyl (Fiberglass Reinforced) Indoor Athletic Surfacing	Technical Data, Shop Drawings, Samples
09774	Poured Urethane Indoor Athletic Floor Surfacing	Manufacturer/Installers Certification - 10 years Experience, Shop Drawings for Game Lines & Track Markings, Technical Data, Samples, Maintenance Instruction, Product Warranty
09800	Special Coatings	Technical Data, Test Data, Samples
09810	Epoxy/Quartz Flooring	Technical Data, Shop Drawings, Sample Panels, Test Results
09815	Elastomeric Quartz Flooring (EnviroChem)	Technical Data, Shop Drawings, Sample Panels, Test Results

<u>Section</u>	<u>Description</u>	<u>Item</u>
09820	Marble Dusting	Technical Data, Shop Drawings, Samples, Water Analysis and Calculations
09831	Silicone Elastomeric Coating	Technical Data, Applicator Certifications
09845	Intumescent Coating	Technical Data, Samples, Sample Panels
09900	Painting	Technical Data, Samples, Field Samples
09902	Polomyx Waterbase Paint	Technical Data, Samples, Field Samples
09950	Wall Coverings	Technical Data, Samples, Certificate of Compliance
09986	Fiberglass Reinforced Plastic Panels	Technical Data, Shop Drawings, Samples
10100	Visual Display Products	Technical Data, Certified Lab Test Reports, Samples
10102	Dry Markerboards	Technical Data, Shop Drawings, Samples
10240	Skylight Safety Screens	Technical Data, Shop Drawings, Samples
10440	Specialty Signs (Roof I.D. Sign)	Technical Data, Full-Sized Samples
10441	Signage	Technical Data, Shop Drawings, Samples
10500	Lockers	Technical Data, Shop Drawings, Finish Samples
10520	Fire Extinguishers and Cabinets	Technical Data, Shop Drawings, Finish Samples
10600	Toilet Partitions (Steel)	Technical Data, Shop Drawings, Finish Samples
10601	Toilet Partitions (Polymer)	Technical Data, Shop Drawings, Finish Samples

10650	Operable Partitions	Technical Data, Shop Drawings, Finish Samples
10651	Electrically-Operated Continuously Hinged Operable Partitions	Technical Data, Shop Drawings, Finish Samples
10800	Toilet Accessories	Technical Data, Shop Drawings, Finish Samples
11060	Stage Equipment	Technical Data, Shop Drawings, Finish Samples, O&M Manuals, Affidavits, Guarantees
11061	Stage Rigging and Drapery	Technical Data, Shop Drawings, Rigging Schedule, Finish Samples, Affidavits, Guarantees
11063	Fire Safety Curtain and Rigging	Technical Data, Shop Drawings, Rigging Schedule, Finish Samples, Affidavits, Guarantees
11400	Food Service Equipment	Technical Data, Shop Drawings
11480	Athletic Equipment	Technical Data, Samples
11482	Resilient Protective Padding	Technical Data, Shop Drawings, Samples, Guarantees
11484	Resilient Safety Tile System	Technical Data, Shop Drawings, Samples, Guarantees
11600	Laboratory Casework and Equipment	Technical Data, Shop Drawings, Test Reports, Certifications, Warrantees
11601	Laboratory Casework and Equipment (Collegedale Casework, Inc.)	Technical Data, Shop Drawings, Test Reports, Certifications, Warrantees
11602	Laboratory Casework and Equipment (Sheldon)	Technical Data, Shop Drawings, O&M Manuals Color and Finish Samples, Warranties

<u>Section</u>	<u>Description</u>	<u>Item</u>
11603	Laboratory Casework and Equipment (Fisher Hamilton Wood Casework)	Technical Data, Shop Drawings, O&M Manuals, Color and Finish Samples, Warrantees
11605	Laboratory Casework and Equipment (Modern School Supplies)	Technical Data, Shop Drawings, Color and Finish Samples, O&M Manuals, Warrantees
11700	Playground Equipment (Playground Environments)	Safety Specifications, Shop Drawings, Warranty
11701	Playground Equipment (Playworld)	Safety Specifications, Shop Drawings, Warranty
11702	Playground Equipment (Park Systems)	Safety Specifications, Shop Drawings, Warranty
12342	Panel Systems	Technical Data, Shop Drawings, Warranty
12345	Laboratory Casework	Technical Data, Shop Drawings, Color and Finish Samples, O&M Manuals, Guarantee
12346	Laminate-Clad Casework (Trimline Series)	Technical Data, Shop Drawings, Color and Finish Samples
12347	Laminate-Clad Computer Casework	Technical Data, Shop Drawings, Color and Finish Samples
12348	Laminate-Clad Casework	Technical Data, Shop Drawings, Samples

12350	Wood Casework and Classroom Wardrobe Units	Technical Data, Shop Drawings, Samples
12492	Spring-Operated Roller Shades	Technical Data, Shop Drawings, Samples
12505	Curtains / Draperies	Technical Data, Shop Drawings, Samples, O&M Manuals, Flame Resistance Affidavits, Guarantee
12510	Horizontal Window Blinds	Technical Data, Shop Drawings, Samples
12520	Vertical Window Blinds	Technical Data, Shop Drawings, Samples
12530	Roller Shades	Technical Data, Shop Drawings, Samples
12642	Classroom Wardrobe Units	Technical Data, Shop Drawings, Samples
12690	Recessed Entrance Mats	Technical Data, Shop Drawings
12710	Auditorium, Arena and Theater Seating	Technical Data, Shop Drawings, Samples
12715	Seating Refurbishment/ Reupholstery	Technical Data, Shop Drawings, Samples
12760	Telescoping Bleachers	Technical Data, Shop Drawings, Samples, Closeout Submittals
12761	Telescoping Gym Seats (Electrically Operated)	Technical Data, Shop Drawings, Project List, Samples, O&M Manuals, Manufacturer Qualifications, Installer Qualifications, Warranty
13050	Access Flooring	Technical Data, Shop Drawings, Installer Qualifications
13122	Metal Building Systems	Technical Data, NYSPE-certified Shop Drawings, Certified Design Analysis, Letter of Certification
13125	Permanent Grandstands	Technical Data, Shop Drawings, Certificates, Product Samples, Color Samples

<u>Section</u>	<u>Description</u>	<u>Item</u>
13650	Prefabricated Structures	Technical Data, Foundation & Pier Location Plans, Complete Set of NYSPE-certified Shop Drawings of Prefab Building
13750	Pre-manufactured Chimneys	Technical Data, Shop Drawings
14200	Elevator (Dover)	Technical Data, Shop Drawings
14220	Vertical Wheelchair Lift	Technical Data, Shop Drawings
14240	Elevator (Otis)	Technical Data, Shop Drawings
15010	General	N/A
15011	Special Conditions	Shop Drawings, List of Equivalents
15012	Work Included	Shop Drawings, As-Builts
15014	Codes, Standards and Permits	N/A
15015	Maintenance Instructions	Maintenance Schedule(s)
15016	Test and Instructions	Written Report to Architect
15017	Vibration and Noise Control	N/A

15018	Motors and Electrical Work	Technical Data
15019	Guarantee	N/A
15020	Cutting and Patching	N/A
15050	Piping and Accessories	Technical Data
15051	Basic Materials and Methods	Technical Data
15052	Pipe Fittings	Technical Data
15053	Joints	Technical Data
15055	Valves	Technical Data
15057	Valve Tags, Nameplates and Identification	Technical Data
15058	Pipe Hangers, Bases and Supports	Technical Data
15139	Steam to Water Heat Exchangers	Technical Data
15141	Centrifugal Pumps	Technical Data
15175	Preliminary Work	N/A
15180	Insulation	Technical Data
15181	Insulation (Second Spec)	Technical Data
15300	Fire Sprinkler System	Technical Data, Shop Drawings
15550	Burners & Controls	Technical Data, Installation certification
15551	Fuel Oil Sump Pump Unit	Technical Data, Shop Drawings
15600	Fuel Oil Storage Tank, Work Included	Technical Data, copies of Permits & Inspections, As-Built Drawings
15601	Hot Water Boilers	Technical Data
15602	Pressure Atomizing Burners	Technical Data

<u>Section</u>	<u>Description</u>	<u>Item</u>
15603	Rooftop HVAC Unit Rehabilitation	Technical Data
15604	Boiler Reconstruction	Technical Data
15605	Cast Iron Boilers	Technical Data
15607	New Duplex Sump Pump Unit	Technical Data
15608	Water Heater	Technical Data
15610	Fiberglass Fuel Oil Storage Tank	Technical Data
15611	Above Ground Diesel Fuel Storage Tank	Technical Data
15612	New Fuel Oil Pump Set/ Burner Modification	Technical Data

15650	Heating, Ventilating & Air Conditioning	Technical Data, Installation Drawings
15651	Thru-wall Heat Pumps	Technical Data
15652	Electric Cabinet Heater	Technical Data
15653	New Cooling Tower and Related Equipment	Technical Data
15656	Temperature Control Systems	Technical Data
15657	Electrical Work	Technical Data, Bill of Materials, Installation Drawings, Wiring Diagrams
15658	Hot Water Boiler (Steel)	Technical Data, Bill of Materials, Installation Drawings, Wiring Diagrams
15659	Vacuum and Boiler Feed Unit	Technical Data, Bill of Materials, Installation Drawings, Wiring Diagrams
15675	Commercial Air-Cooled Condensing Units	Technical Data, Installation Drawings
15700	Heat Transfer	Technical Data, Installation Drawings
15701	Hot Water Convector Units	Technical Data, Installation Drawings
15702	Classroom Unit Ventilators	Technical Data, Installation Drawings
15703	Make-up Air Unit and Exhaust Fan	Technical Data, Installation Drawings
15705	Rooftop Unit (RTU-3)	Technical Data, Installation Drawings
15706	Rooftop Unit (RTU-2)	Technical Data, Installation Drawings
15710	Hot Water Coils	Technical Data, Installation Drawings
15761	Fan Coil Units	Technical Data, Installation Drawings
15800	Air Distribution	Technical Data, Installation Drawings
15802	Inspection, Testing & Balancing	Final Reports to the Architect
15803	Gravity Louvers/Penthouses	Technical Data, Shop Drawings
15804	Exhaust Fans	Technical Data, Installation Drawings
15805	Ductwork	Technical Data, Shop Drawings
<u>Section</u>	<u>Description</u>	<u>Item</u>
15806	Fire Dampers	Technical Data, Shop Drawings
15807	New Dust Collection Unit	
15808	Registers, Grilles & Diffusers	Technical Data, Shop Drawings
15810	Retractable Kiln Exhaust Hood	Technical Data, Shop Drawings
15860	Light Duty Air Handling Units	Technical Data, Shop Drawings
15861	Light Duty Air Handling Units (Second Spec)	Technical Data, Shop Drawings
15903	Automatic Temperature	Technical Data, Shop Drawings

	Controls	
15904	Electronic Automatic Temperature Control	Technical Data, Shop Drawings
15011A	Special Conditions	Technical Data, Shop Drawings
15012A	Work Included	Technical Data, Shop Drawings
15013A	Codes, Standards and Permits	N/A
15014A	Schedule of Frequency	N/A
15015A	Maintenance Instructions	Technical Manuals, Maintenance Schedules, Parts List, List of Local Suppliers
15016A	Test & Instructions	Written Report to the Architect
15019A	Guarantee	Printed Guarantees
15050A	Basic Materials and Methods	Technical Data
15052A	Electric Wiring for Plumbing Work	Wiring Diagrams, Shop Drawings
15053A	Joints	Technical Data
15054A	Pipe Specialties	Technical Data
15055A	Valves	Technical Data
15057A	Valve Tags, Nameplates, & Identification	Technical Data
15058A	Pipe Hangers, Bases & Supports	Technical Data
15060A	Cutting and Patching	N/A
15180A	Piping Insulation	Technical Data
15302A	Sewer Installation	Technical Data
15400A	Plumbing System	Technical Data, Installation Drawings
15403A	Drainage & Vent Systems	Technical Data, Installation Drawings
15404A	Domestic Water System	Technical Data, Installation Drawings, Test Results
15409A	Plumbing Fixtures	Technical Data, Roughing Drawings
15410A	RPZ Device in Hot Box	Technical Data, Installation Drawings
15410A	New Duplex Sump Pump Unit	Technical Data
15411A	Water Heater	Technical Data, Installation Drawings
<u>Section</u>	<u>Description</u>	<u>Item</u>
15420A	Domestic Hot Water Heaters	Technical Data, Installation Drawings
15430A	Exhaust Fan	Technical Data, Installation Drawings
16010	Electrical Work	Technical Data, Shop Drawings
16013	Work Included	N/A
16100	Basic Materials & Methods	Technical Data, Shop Drawings

16140	Wiring Devices	Technical Data
16200	Power Generation	Technical Data
16202	Emergency Generator	Technical Data, Connection Diagrams
16203	Automatic Transfer Switch	Technical Data, Test Data
16429	120/208 and 120/240 Voltage Distribution	Technical Data, Shop Drawings (see 16429), Closeout Submittals
16462	Dry-Type Distribution Transformers K-Rated	Technical Data, Shop Drawings (see 16462), Closeout Submittals
16470	Panelboards	Technical Data, Shop Drawings (see 16470)
16475	Circuit Breakers	Technical Data, Installation Drawings
16500	Lighting	Technical Data, Installation Drawings
16502	Auditorium Lighting Control System	Technical Data, Installation Drawings
16510	Theatrical Lighting	Technical Data, Installation Drawings
16530	Site Lighting	Technical Data, Installation Drawings
16601	Lightning Protection	Technical Data, Installation Drawings
16671	Transient Voltage Surge Protection (TVSS)	Technical Data, Installation Drawings
16700	Telecommunications System	Technical Data, Shop Drawings, Reports
16704	Security System	Technical Data, Shop Drawings, Reports
16705	Fire Alarm and Smoke Detection System	Technical Data, Shop Drawings, Calculations
16706	Modified Public Address System	Technical Data, Shop Drawings
16707	Public Address Sound System	Technical Data, Shop Drawings, Warranties
16708	Auditorium Sound System	Technical Data, Shop Drawings, O&M Manuals
16720	Fire Alarm System	Technical Data, Installation Drawings
16730	Master Time-Program Clock System	Technical Data, Installation Drawings
16755	Electrical Security System	Technical Data, Shop Drawings, Qualifications
16760	Communications Systems	Technical Data, Shop Drawings, Samples
16810	Computer Network	Technical Data, Shop Drawings
17010	Technology Implementation	Technical Data, Installation Drawings

PART TWO - PRODUCTS

NOT APPLICABLE

PART THREE - EXECUTION

NOT APPLICABLE

END OF SECTION

BBS

ARCHITECTS LANDSCAPE ARCHITECTS

01300-28
Rev. 08-10-11

ENGINEERS

244 East Main Street ■ Patchogue, New York 11772
Tel (631) 475-0349 ■ Fax (631) 475-0361 ■
Const. Admin., MEP & T Depts. Fax (631) 654-9398

Submittal Cover Sheet

Name of Contractor: _____

Project: _____

Date: _____ Architect's Project No: _____

Items Submitted: _____

Manufacturers: _____

Model No's: _____

Submission Number: _____

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:

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01550 - 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 01050 - *"Uniform Safety Standards for School Construction and Maintenance Projects - Commissioner's Regulations"*
 - 2. Division 1 Section 01352 - *"LEED Requirements"* for additional LEED requirements. *(For LEED Certified Projects)*
 - 3. Division 1 Section 01524 - *"Construction Waste Management"* for recycling construction waste. *(For LEED Certified Projects)*

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

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01600 - ASBESTOS WORK UNDER THIS CONTRACT

1.01 ASBESTOS HAZARD

- A. The disturbance and dislocation of asbestos-containing materials causes asbestos fibers to be released into the building's atmosphere, thereby creating a health hazard to workmen and building occupants. Consistent with content of the training session on asbestos control work, the Contractor shall appraise all of his workers, supervisory personnel, subcontractors, and consultants who will be at the job site of the seriousness of the hazard and of proper work procedures which must be followed.
- B. Where in the performance of the workers, supervisory personnel, subcontractors, or consultants may encounter, disturb, or otherwise function in the immediate vicinity of any identified asbestos-containing materials, appropriate, continuous measures as necessary to protect all building occupants from the hazard of exposure to airborne asbestos shall be taken.
- C. If found in non-compliance with these specifications, the Contractor will be served a written notice to this effect. This written notice will serve as a warning. Further non-compliance of these specifications of safety regulations will be cause of cancellation of contract.
- D. All asbestos containing materials, and asbestos contaminated materials abatement work shall be performed in accordance with the applicable provisions of NYS DOL Industrial Code Rule 56 (12 NYCRR Part 56), USEPA 40 CFR Part 763 (AHERA), 40 CFR Part 61, 29 CFR Part 1910, 29 CFR Part 1926, NYS DEC Title 6 part 364, NYS Department of Health Title 10 part 73 and all other applicable federal, state and local laws, rules and regulations having jurisdiction over this project, and shall include all aspects of worker safety & protection.

1.02 WORK INCLUDED

- A. The work under this section shall include all labor, materials, equipment, and performance of all operations in connection with the abatement of asbestos containing materials, completely in accordance with the applicable drawings, specifications, and governing code authorities.
- B. The following list of items is to be used as a guide to the Contractor and shall not be considered as limiting the scope of work.
 - 1. Contractor shall visit the site and become thoroughly acquainted with the scope of work prior to bidding.
 - 2. Do all cutting and patching as required.
 - 3. Obtain all inspections and permits, and pay all required fees.

4. Provide and install new non-asbestos materials to replace asbestos materials removed, unless otherwise noted.
5. All removal work shall be done under negative pressure with HEPA-filtered, powered exhausts.
6. All areas shall be damp cleaned after all removal work has been completed.
7. A copy of the Notification Letter from Contractor to the U.S. E.P.A., from the Contractor to the New York State Department of Labor, Division of Safety and Health Asbestos control Program, dump receipt and waste manifest shall be sent to the Engineer for review prior to final payment.
8. All areas containing asbestos shall have a surfactant (wetting agent), similar to amended water, applied to all surfaces.
9. All E.P.A., OSHA, N.Y.S. Department of Labor Industrial Code Rule 56 and Department of Health regulations and guidelines shall be strictly adhered to, including all provisions of these specifications. Any modifications must be authorized in writing and incorporated exactly as specified.
10. Contractor shall be permitted to use the "glove/bag" method for asbestos removal where applicable if accomplished in accordance with all regulations.
11. The Contractor shall make provisions for the possibility of the heating system remaining on during the course of the work.
12. All existing finishes contiguous to the work area and inclusive of the work area shall be restored to original condition. Any damage caused under this contract shall be repaired by the Contractor (e.g. paint peeled off by barrier tape, nail holes, water damage, broken glass, etc.), at no additional cost to the building owner.
13. Any furniture, equipment, or materials moved during the course of this contract shall be placed back to its original position. These materials shall be pre-abatement cleaned before removal from the work area as per Code Rule 56, Section 56-8.1.
14. Contractor shall provide the Engineer with copies of certificates issued by the New York State Labor Department and EPA-AHERA.
15. Notify, on forms provided by the New York State Labor Department, both the Labor Department and the EPA 10 days prior to the commencement of work.
16. Licensed waste haulers shall be used.
17. Contractor shall be responsible for all OSHA air testing. The Owner will contract an independent testing laboratory for all other air monitoring, including TEM clearance samples.

18. Contractor shall provide and post near or within the abatement project clean room a written emergency procedure program in each appropriate language signed by each worker.
19. Any electrical service contained in the abatement areas either shall be completely shut down and locked out or critically barriered to remain outside the abatement area. Temporary electrical power shall be brought in from outside the abatement area with ground fault interruption protection furnished at the source. Power source shall be secured to avoid accidental shutdown of negative air infiltration equipment. If necessary, Contractor shall provide for an exterior separately generated power source.
20. Contractor shall post all supervisor and worker accreditations, owners, monitoring firms, and designers phone numbers, company's written respiratory protection program, written emergency procedures, project log book, and written notification to the occupants of the building 10 days prior to the commencement of work as required by code.
21. A copy of the log book, waste manifests, and dump receipts shall be submitted to the Owner prior to job completion and sign off.
22. A copy of the standard operating procedure, employee protection plan, OSHA medical monitoring, and respiratory training and protection plan shall be submitted to the Owner prior to work start up.
23. Contractor shall be GPAC approved or shall furnish an engineering specification for any equal system proposed for use.
24. Contractor shall provide separate filtered sump pump systems for drainage of all areas as required to remove waste water. Filtration system shall assure a minimum of five micron effectiveness.
25. For work above hung ceiling, perimeter tiles shall be removed under full containment and all walls properly sealed and plasticized up to the deck. This shall include critical barriers on all openings in wall and deck above hung ceiling. Ceiling can then be removed and abatement completed.
26. Contractor shall comply with all U.L. Labor Department and OSHA fire safety regulations including 29 CFR 1910 and 1926.
27. Fixed objects and other items which are to remain in the work area shall be pre-cleaned and plasticized as per code.
28. The entire work area shall be precleaned as per code.
29. All plastic sheeting used shall be of the fire retardant type.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01610 - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1 - General Requirements form a part of this Section.
- B. The extent of asbestos-bearing materials to be removed under this Project is indicated on the drawings and as indicated within test results provided by the District's Project Monitor. All work shall be performed in accordance with the latest regulations issued by the New York State Labor Department. Documentation as noted below required by all agencies having jurisdiction is included in the contractors Scope of Work including any and all fees for permits, dumping, testing or monitoring except as specified elsewhere.

1.02 QUALITY ASSURANCE

A. Acceptable Contractor

- 1. Must have a minimum of three (3) years continuous experience as a contractor normally engaged in asbestos Abatement.
- 2. Shall have completed at least five (5) or more similar projects within the last five years.
- 3. Must have completed projects with the E.P.A. and New York State Department of Labor Jurisdiction and Management.
- 4. Workers and supervisors must be accredited in accordance with the requirements of all applicable rules and regulations.

B. Licensing and Certification

- 1. No Contractor shall engage in an asbestos project unless such Contractor has a valid asbestos-handling license issued by the Commissioner.
- 2. A copy of a valid asbestos handling license or other proof of the issuance of a valid asbestos handling license deemed suitable by the Commissioner shall be submitted by the bidder.
- 3. A copy of a valid asbestos handling license shall be conspicuously displayed approximate to but outside the work area on an asbestos project.
- 4. No Contractor shall engage in or permit a person employed by the Contractor to engage in or supervise work on an asbestos project involving the removal, encapsulation, or enclosure of asbestos or asbestos material or the disturbance of asbestos unless each such person has a valid asbestos handling certificate.

5. Any person employed on an asbestos project whose duties shall involve the removal, encapsulation, or enclosure of any asbestos material or the disturbance of asbestos or the supervision of such work shall have an asbestos handling certificate or a copy thereof in his/her possession at all times during his/her work on the project.
6. The Contractor conducting the abatement work shall be accredited by the E.P.A. to conduct response actions. Proof of accreditation shall be submitted with bid.

1.03 APPLICABLE CODES

- A. All work of this contract shall comply with applicable provisions of the:
 1. Occupational Safety and Health Administration (OSHA), including:
Asbestos Regulation
Title 29, Part 1910, Sections 1001, 134, 1926,.2, and .1200.
Code of Federal Regulations
 2. Environmental Protection Agency
Regulations for Asbestos
Title 29, Part 61, Sub-parts A and P, Sub-part F, of the Code of Federal Regulations and EPA Asbestos Hazard Emergency Response Act (AHERA), 40 CFR, Part 763.
 3. New York State Department of Environmental Conservation (DEC)
(Editorial Note: This is required only where asbestos-containing materials will be transported to a sanitary landfill). Regulations regarding industrial waste collector registration Title 6, Part 364, of the New York State Official Compilation of Codes, Rules, and Regulations--6NYCRR364.
 4. New York State Department of Labor
Asbestos
Part 56 of Title 12 - Industrial Code Rule 56
 5. New York State Department of Health
Asbestos Safety Program Requirements
Part 73 of Title 10
Environmental Laboratory Approval Program
- B. Two copies of A and B above shall be obtained by the Contractor. One copy of each shall be posted at the job site. One copy of each shall be on file in the Contractor's office.
- C. The most recent edition of any relevant regulation, standard, document, or codes shall be in effect. Where conflict among the requirements or with these specifications exists, the most stringent requirements shall be utilized.

1.04 OCCUPANCY OF SITE

- A. The normal occupants of the work areas will be relocated during the performance of the work and returned thereto at the conclusion of the work at no cost to the Contractor. However, the Contractor shall protect all furniture and equipment in the work areas in a manner as hereinafter specified for walls and floors. In addition he will perform the work of this contract in a manner that will be least disruptive to the normal use of the non-work areas in the building.
- B. Attention is specifically drawn to the fact that other contractors, performing the work of other contracts, may be (or brought upon) any of the work sites of this contract.

Therefore, the Contractor shall not have exclusive rights to any site of his work and shall fully cooperate and coordinate his work with the work of other contractors who may be on (or brought upon) any site of the work of this Contract.

1.05 NOTIFICATION

- A. The Contractor shall notify the following agencies in writing ten (10) days prior to the start of the asbestos removal project:
 - 1. U.S. Environmental Protection Agency
Asbestos Neshaps Contact:
USEPA Division
26 Federal Plaza
New York, NY 10007
 - 2. New York State Department of Labor
Division of Safety and Health's Asbestos Control Program
1 Main Street
Brooklyn, NY 11201
- B. Notification to the agencies in Paragraph A above shall include the following information:
 - 1. Name and address of Owner of building.
 - 2. Name, address and asbestos license number of Contractor.
 - 3. Address and description of the building, including size, age and prior use of the building or area, and amount of asbestos material present in square feet and/or linear feet, as applies. Designate room numbers or other location information unless entire building is involved.
 - 4. Scheduled starting and completing dates for removal and/or encapsulation.
 - 5. Procedures and equipment (including ventilating systems) that will be employed to comply with 40 CFR Part 61, "National Emission Standards for Hazardous Air Pollutants".

6. The name and address of the waste disposal site where asbestos waste will be deposited.
7. The name, address and ELAP registration number of the Monitoring Firm to perform air monitoring and analysis of air samples on behalf of the Contractor's employees.
8. Any and all requirements in Part 56 Title 12 NYCRR 56-1.6 (d).

1.06 PERMITS

A. DEPARTMENT OF ENVIRONMENTAL CONSERVATION

1. Permit: An annual "Industrial Waste Hauler Permit", specifically for asbestos-containing materials, is required pursuant to 6 NYCRR 364 for transporting of waste asbestos containing materials to a legal disposal site.
2. Asbestos-containing waste materials to be transported shall be packed in accordance with Environmental Protection Agency requirements, i.e.: that the asbestos be bagged, in sealed-tight containers, and that the bags and containers shall be properly labeled.

B. ENVIRONMENTAL PROTECTION AGENCY

1. Notification: At least 10 days prior to beginning work on the asbestos-containing materials, the Contractor shall send written notification to the Environmental Protection Agency, Region II, Air and Hazardous Material Division, with a copy to the Architect/Engineer and the Owner.
2. The notification shall include the information as indicated in 1.04B above.

C. DEPARTMENT OF LABOR

1. At least 10 days prior to beginning work on the asbestos-containing materials, the Contractor shall send written notification to the New York State Department of Labor Asbestos Control Bureau of the Department's Division of Safety and Health. Notification shall be in writing and on the forms provided by the Commissioner.

1.07 REGULATORY COMPLIANCE

- ##### A.
- The Contractor shall furnish documentation to the building owner or his designated representatives that the firm and its employees are familiar with the following regulations of the US Department of Labor, Occupational Safety and Health Administration (OSHA) and the US Environmental Protection Agency (EPA) relating to the removal, disposal and treatment of asbestos.

1. OSHA regulations, namely: Section 1910.1001, Asbestos of 29 CFR Part 1910 and 29 CFR 1926, 29 and CFR 1910.134, "Respiratory Protection" and 29 CFR 1910.20, "Access to Employees Exposure and Medical Records".
 2. EPA regulations, namely: Sub-parts A and B of 40 CFR Part 61, "National Emission Standards for Hazardous Air Pollutants".
 3. Labor Department, namely: Part 56 Title 12 NYCRR.
- B. New York State Department of Environmental Conservation (DEC):
1. Regulations regarding industrial waste collector registration.
 2. Title 6, Part 364 of the New York State Official Compilation of Codes, Rules and Regulations - 6 NYCRR 364.
- C. The New York State Education Department (S.E.D.)
1. Guidance Document for control and Abatement of Asbestos Conditions in Public Schools, latest edition.
- D. Two (2) copies of each of the above shall be obtained by the contractor; One (1) copy of each shall be posted at the job site.
One (1) copy of each shall be on file in the Contractor's Office.
- E. The Contractor shall display copies of the Documents required by governing agencies.
- F. A list of emergency telephone numbers shall be maintained at the job site and shall include the Architect, Engineer, Building Representative, Monitoring Firm employed by the Contractor, Fire, Police, emergency Squad, local Health Department and Hospital.
- G. The Contractor shall be responsible for controlling access at the work site and shall maintain a daily log of personnel entering the Work Area. A list of worker names shall be posted with their start and stop times for each day. Copies of daily log forms will be given to the asbestos Safety Inspector at the end of each week's work progress.
- H. The Contractor shall post at the job site documentation that all employees have received medical examinations, as required by OSHA and documentation of respirator training and fit-testing, as required by OSHA 1910.134 and 29 CFR 1926.
- I. The Contractor shall strictly adhere to all precautions necessary for the safety and health of the workers in accordance with provisions of OSHA Standards 29 CFR Part 1926, construction Standards and Section 1910.001, Asbestos of 29 CFR 1910, General Industry Standards and Section 1910.134 Respiratory Protection of General Industry Standards.

1.08 PROTECTIVE CLOTHING AND EQUIPMENT

- A. Clothing - Protective clothing shall consist of disposable full body coveralls, with hoods and booties attached. Separate disposable head-covers and foot covering may be substituted if disposable coveralls without attached hoods and booties are used. Additional clothing shall include boots or sneakers and gloves. Eye protection and hard hats shall be available as appropriate.
- B. Respirators - The Contractor shall provide the required respirators and protective clothing to all workers, and to all official representatives of the Owner, State or other governmental entity, and the Asbestos Safety Monitor who may inspect the job site.

During the preparation of the work site, contractors may choose between two types of respiratory protection as specified. In order of increasing effectiveness, they are:

1. Power air purifying respirators certified by NIOSH for use in atmospheres containing asbestos.
2. Type "C" supplied air respirators, either continuous flow or pressure demand class as certified by NIOSH.

NOTE: Respiratory protection must comply with the exposure limits described in OSHA 1910.1001 and 1926.

The Contractor shall require that each person entering the Work Area shall wear an approved respirator and protective clothing. There shall be no exceptions to the rule.

- C. Air Filtration Units - The Contractor shall have available air filtering equipment capable of filtering asbestos fibers to 0.3 um at 99.97% efficiency and of sufficient quantity and capacity to cause a complete air change within the work area once every 15 minutes, exhausting the filtered air so as to maintain a negative pressure inside the work area of sufficient flow through the decontamination chamber and waste exit port so as to prevent escape of airborne fibers. The units shall have been calibrated by the DOT challenge. The number of Negative Air Filtration units needed for the application is determined by dividing the required capacity of the ventilation system as measured in feet³ min. by the rated capacity of the Negative Air Filtration units to be used. The number of units needed (Total feet³ /min)/(Capacity of unit (in feet³))

Example of calculation for determination of required number of negative air filtration units:

1. The dimensions of room in which asbestos is to be removed are 120 feet by 60 feet by 10 feet high.
2. Room volume = 120 x 60 x 10 = 72,000 feet³.

3. The required capacity of the ventilation system in cubic feet per minute (CFM) is determined by dividing the volume by the required minimum air change rate: one complete room volume exchange every 15 minutes. Required capacity of the ventilation system:
$$\frac{72,000 \text{ cubic feet}}{15 \text{ minutes}} = 4800 \text{ cubic feet per minute (CFM)}$$
4. The rated capacity (in CFM) of the negative air filtration unit (with a clean HEPA filter in place) shall be determined as provided by the manufacturers technical data. In this example, suppose the manufacturers rating for the negative air filtration unit with a clean HEPA filter in place is 1200 CFM.
5. In order to determine how many units are needed, divide the required capacity of the ventilation system (from Item 3 above) by the rate and capacity of the negative air filtration units (from Item 4 above).

$$\frac{4800 \text{ CFM}}{1200 \text{ CFM}} = 4 \text{ negative filtration units needed for this area.}$$

NOTE: As filter loading occurs during the removal process, the rated capacity of the negative air filtration system will decrease.

6. Replacement air shall enter the Work Area through the decontamination facility, in order to reduce the possible escape of contaminated air. The entire alternate ventilating system shall be installed and operating prior to commencement of asbestos removal.

D. Other Equipment:

1. Vacuums shall be equipped with HEPA filters capable of filtering asbestos to 0.3 um at 99.97% efficiency.
2. Polyethylene bags shall be 6 mil thick, labeled as per OSHA 1910.10041 and EPA 40 CFR 61, Sub Part M, and used for the disposal of asbestos contaminated waste.
3. All tape shall be a high quality duct tape. All spray-on adhesives, glue and other barrier securing material shall also be high quality products. If site conditions negate the performance of one type of system for securing barriers, a suitable alternative shall be required and provided by the Contractor at no additional cost.
4. Power: The Contractor shall have available power cables and sources such as generators to maintain negative air pressure in the work area in the event of power outage.

5. Portable Showers: The Contractor shall have available stalls and sufficient hose length and drain systems or an acceptable alternate such as a portable decontamination trailer with showers. Provide temporary extensions of existing hot and cold water and drainage, as necessary for a complete and operable shower. Waste shower water shall be filtered through a minimum of 5 um filters and recycled to be used as a wetting agent or added to asbestos contaminated waste before disposal in an approved landfill.
 - a. Portable showers shall be provided and shall be located at the work area exit so that workman go through the shower directly before entering the changing area. One shower shall be provided for every six (6) workers.
 - b. Provide a continuously adequate supply of soap and towels and maintain all areas in a sanitary condition.
 - c. If the portable shower is located within an area containing friable asbestos on overhead ceilings, ducts, piping, etc., the shower area shall be provided with a minimum 1/4-inch hardboard "ceiling" with a polyethylene sheeting, at least 6 mil. in thickness, covering the top of the "ceiling."
 - d. Shower shall be in accordance with Code Rule 56, Section 56-9.1.
 6. Ladders and Scaffolds: The Contractor shall have available ladders and/or scaffolds of sufficient quantity and adequate length and maintain them on site to allow inspection of elevated removal surfaces. Scaffolding may be of suspension type, of standing type such as metal tube and coupler, tabular welded frame, pole, or outrigger type or cantilever type. The type, erection, and use shall comply with all applicable OSHA provisions. During the erection and/or moving of scaffolding, care must be exercised so that any polyethylene covering is not damaged.
- E. The Contractor shall have available sufficient inventory of protective clothing, respirators, filter cartridges, glue, spray on adhesives and air filters. Personal protective equipment inventory shall exceed by a minimum of 100% the expected daily person-day usage.
 - F. Each worker shall be instructed and trained in proper respirator use and shall always wear a respirator, properly fitted on the face, in the work area until the work area is completely decontaminated. Respirators shall be approved by the National Institute for Occupational Safety and Health (NIOSH) for use in asbestos-containing environments and shall be PAPR type at minimum. Half-face and single-use paper respirators are not permitted. All persons shall enter and exit the work area through the personal decontamination enclosure system, and must sign the entry/exit log each time.
 - G. Packing boxes for the respirators (masks) and for disposal filters shall show the logo of NIOSH and shall also indicate that the masks and filters are for use in asbestos-containing environments.

- H. Supply a sufficient quantity of respirator filters approved for asbestos so that the workers can change filters during the work day. Respirators shall be wet rinsed, and filters discarded, each time a worker leaves the work area. New filters shall be installed each time the worker re-enters the work area. Respirators and filters shall be stored at the job site in the changing room and shall be totally protected from exposure to asbestos prior to their use.
- I. Workers shall wear disposable, full-body overalls and disposable head and footwear covers in the work area. Footwear may be "non-disposable," in which case it shall be left in the work area at all times and shall be disposed of at the completion of the work.
- J. All workers, without exception, shall:
1. Remove street clothes in the changing area and put on new disposable coveralls, new head covers, new footwear covers, unless "non-disposable" footwear has been left in the work area, and a clean respirator each time the work area is entered.
 2. Remove the disposable coveralls, disposable head covers, and disposable footwear covers or "non-disposable" footwear in the equipment room before leaving the work area. Gross contamination shall be removed prior to leaving the work area.
 3. Still wearing respirators, proceed to showers. Showering is mandatory. Care must be taken to follow reasonable procedures in removing the respirator and filters to avoid asbestos fibers while showering. The following procedure is recommended:
 - a. Thoroughly wet body from neck down.
 - b. Wet hair as thoroughly as possible without wetting the respirator filter.
 - c. Take a deep breath, hold it, and/or exhale slowly, complete wetting of hair, thoroughly wetting face, respirator, and filter. While still holding breath, remove respirator and hold it away from face before starting to breathe.
 - d. Dispose of wet filter.
 - e. Shower completely with soap and water.
 - f. Rinse thoroughly.
 4. Shower each time before entering the changing area to change into street clothes or into new disposable work items.
 - a. Workers shall NOT eat, drink, smoke, and chew gum or tobacco in the work area. To eat, drink, or smoke, workers shall follow the procedures described in 3B and 3C, then dress in street clothes before entering the non-worker area of the building.
 - b. No worker sporting a beard shall be allowed inside the work area.

- c. Respirators shall be inspected prior to each use and tested for proper seal using quantitative or qualitative fit checks.

1.09 GUARANTEE

- A. Work performed shall be guaranteed for a period of one year from the date of Substantial Completion.
- B. The Contractor shall not be held liable for the guarantee where the repair required under the guarantee is a result of obvious abuse or vandalism.

1.10 REQUIRED INSPECTIONS

- A. Pre-commencement inspections shall be conducted as follows:
 - 1. Notification to the Asbestos Safety Control Monitor shall be made by the Contractor to request a pre-commencement inspection at least 48 hours in advance of the desired date of inspection. This inspection shall be requested each time another work site is started in a multi-phase project.
 - 2. The Asbestos Safety Technician shall ensure that:
 - a. The job site is properly prepared and that all containment measures are in place pursuant to this subchapter;
 - b. Measure for the disposal of removed asbestos material are in place and shall conform to the adopted standard;
 - c. The contractor has a list of emergency telephone numbers at the job site which shall include the Asbestos Safety Control Monitor firm employed by the building Owner and telephone numbers for fire, police, emergency squad, local hospital and health officer.
 - 3. If all is in order, the Asbestos Safety Technician from the Asbestos Safety Control Monitor Firm shall issue a written notice to proceed in the field. If the job site is not in order, then any needed corrective action must be taken before any work is to commence. Conditional approvals shall not be granted.
- B. Progress Inspections shall be conducted as follows:
 - 1. If the Asbestos Safety Technician observes irregularities at any time, the Asbestos Safety Technician shall direct such corrective action as may be necessary.

2. If the contractor fails to take the corrective action required, or if the contractor, any of their employees habitually and/or excessively violate the requirements of any regulation, then the Asbestos Safety Technician shall order the work stopped in writing. If the contractor fails to comply with the order, then the Asbestos Safety Technician shall notify the administrative authority having jurisdiction and/or the building owner who shall issue a Stop Work Order to the contractor and have the work site secured until all violations are corrected.

C. Pre-sealant Inspection shall be conducted as follows:

1. Upon completion of the removal phase, a visual inspection shall be conducted to ensure that all asbestos-containing material has been removed properly before encapsulation begins.

D. Clean-up Inspection shall be conducted as follows:

1. Notice for clean-up inspection shall be requested by the contractor in advance of the desired date of inspection.
2. The clean-up inspection shall be conducted prior to the removal of the critical barriers.
3. The Asbestos Safety Technician from the Asbestos Safety Control Monitoring Firm shall ensure that:
 - a. The work site has been properly cleaned and is free of visible asbestos and asbestos containing material.
 - b. All removed asbestos has been properly removed from the site in accordance with the regulations of the EPA.
 - c. Final air monitoring levels as required or lower have been attained.
4. If repeated inspections are required due to failure to properly clean the work area the cost of these inspections will be back charged to the contractor.

1.11 REQUIREMENTS OF ASBESTOS DISPOSAL

- A. All asbestos waste materials destined for disposal shall be wetted and packaged in permanently sealed, leak-tight containers (such as double 6-mil plastic bags) in accordance with 40 CFR 61.20-25 before it can be legally transported and disposed of. No haulage of loose asbestos is permitted. A locked, secure container shall be provided by the contractor if asbestos waste is to be stored outside unattended.
- B. Asbestos-containing material and debris which is properly packaged in accordance with the provisions of 1.11A above with regard to removal may be disposed of at a sanitary landfill when certain precautions are taken.
 1. Note to Environmental Protection Agency.

2. Permit: An "Industrial Waste Hauler" permit is required for transporting asbestos-containing materials to a disposal site.
- C. Asbestos waste can be hauled in trucks or dumpster containers provided the load is comprised only of asbestos in bags and does not contain any other wastes or asbestos containing wastes which could compromise the integrity of the permanent containers. If other materials are present in the load, which could potentially puncture the permanent containers, then those containers shall be enclosed in temporary fiber or steel drums during loading, transport and unloading operations. In addition, asbestos wastes shall not be loaded into or hauled with vehicles containing compaction devices, as the normal compaction cycle will threaten the integrity of the permanent container.
- D. All containerized waste shall be carefully loaded on trucks or other appropriate vehicles for transport. Before and during transport, care shall be exercised to ensure that no unauthorized persons have access to the materials.
- E. At the burial site, the sealed plastic bags may be carefully dumped from the drums, except where bags are broken or damaged. They shall be left in the drum and the entire contents buried. Uncontaminated drums may be recycled.
- F. Contractor shall ensure that no "back hauling" is engaged in by the industrial waste hauler.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01611 - TEST LABORATORY SERVICES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work includes the testing and monitoring for Contractors employees:
 - 1. Contractor shall submit the name of the testing laboratory he intends to employ for approval by the Architect, and
 - 2. Cooperate fully with selected testing laboratory and all others responsible for testing and inspecting the work.
 - 3. Costs of testing during removal shall be in accordance with OSHA regulations and paid for by the Contractor.
- B. Related work specified elsewhere:
 - 1. Requirements for testing are described herein and in other Sections of these Specifications.
 - 2. Payment for monitoring and final air testing will be made by the Owner.

1.02 AIR MONITORING

- A. Through the entire asbestos-control operation and project decontamination, air monitoring shall be conducted to insure compliance with OSHA and New York Department of Labor regulations. Air monitoring shall be conducted as prescribed by Section 1910.1001 (F)3 of OSHA and Sub-part 56-17 of Department of Labor, New York State regulations.

1.03 LABORATORY TESTING

- A. The services of an approved independent testing laboratory shall be employed to perform laboratory analysis of the air samples as prescribed by Section 1910.1001(E) of OSHA regulations and N.Y.S. Department of Health 502. Submit for approval of the Architect/Engineer, the name of the laboratory. Approval must be obtained prior to commencing the asbestos-control work. A complete record, certified by the testing laboratory, all air monitoring tests and results shall be furnished to the Architect/Engineer and the Board of Education.

1.04 COST OF TESTING

- A. Asbestos project air sampling and analysis requirements shall be as following:
 - 1. ***The cost of OSHA air monitoring shall be included in the Contractor's bid.***

2. *The cost of any background, TEM clearance, or any additional monitoring shall be borne by the Owner.*
 3. *Should the clearance samples come back above permissible levels, the cost of any additional required air sampling shall be paid by the Contractor, including monitoring fees.*
 4. *Any additional cost for quick turnaround air testing due to the Contractor's failure to meet specified completion dates shall be borne by the Contractor, including monitoring fees.*
 5. *Should the Contractor notify the hygienist that the work area is ready for inspection, any work site which is either not prepared properly or fails the inspection shall be reinspected at the Contractor's expense.*
 6. All air sampling technician and project monitor certificates shall be posted at all times.
 7. All laboratories used shall be accredited by the AIHA or by the New York State Department of Health for the selected methodology of sampling and analysis of asbestos.
 8. The contractor shall note that the Architect/Engineer (Project Designer) **is not** the Project Monitor on this project. The Project Monitor will be assigned or handled by the Owner.
- B. Through the length of the project, the monitoring firm shall conduct inspections to perform both barrier air monitoring as well as procedural inspections.

<u>Pre-Abatement</u> (Area Preparation)	<u>Abatement</u> (Work in Progress)	<u>Post-Abatement*</u> (Clearance Air Monitoring)
PCM	PCM	TEM, PCM

*Aggressive Air Sampling Techniques shall be used.

Final Clearance Transmission Electron Microscopy (TEM) shall show the average fiber concentration as per 40 CFR Part 763, Sub-Part E, Appendix A, as below 70 structures per square millimeter (705/mm²).

1.05 QUALITY ASSURANCE

A. Qualifications of Testing Laboratory:

The Contractor shall employ an Industrial Hygienist or Laboratory to conduct air testings. They shall be selected from the latest Interim Listing of Commercial Laboratories prepared by Research Triangle Institute, Research Triangle Park, N.C. 27709.

B. Codes and Standards:

1. Air testing shall be in accordance with EPA and the requirements of Section 0910.1001 (a) and (f) and 1926 of the OSHA 2206 regulations.

2. Analysis of contaminated filters shall be in accordance with NIOSH method using phase contrast microscopy. Membrane filter shall be 37-mm diameter, open face.
3. Testing Laboratory shall be from the approved list of firms of the Environmental Laboratory Approved Program of the New York State Health Department.

1.06 SUBMITTALS

A. Test Reports:

1. Promptly process and distribute three (3) copies of the test results, to the Architect.
2. Prompt reports are necessary so that, if required, modifications to work methods and/or practices may be implemented as soon as possible.
3. The contractor shall verbally notify the Architect within 24 hours of the results of each test, followed by written notification within three days.

1.07 PAYMENT FOR FINAL AIR TESTING

A. Final Air Testing Costs:

All cost for the first final air testing following clean-up as required by this contract shall be paid for by the Owner.

B. Re-testing:

Should air tests (following final clean-up) indicate a fiber count greater than .01 fibers per cubic cm. in any of the building areas, the Contractor shall re-clean the specific area. The Owner will then have the area re-tested. ***All costs of such re-testing will be at the Contractor's expense.***

1.05 CONTRACTOR'S TESTING

- A. Inspecting and testing performed exclusively for the Contractor's convenience and to assure compliance with Section 1910.1001 and of the OSHA Regulations, shall be the sole responsibility of the contractor. ***The cost thereof shall be deemed included in the bid price.***

PART 2 - EXECUTION

2.01 COOPERATION WITH TESTING LABORATORY

- A. Representative of the Testing Laboratory shall have access to the work area at all times. The Contractor shall provide facilities for such access in order that the Laboratory may properly perform its function.

2.02 TAKING SPECIMENS

- A. Specimens and samples for testing shall be taken by the testing personnel. Sampling equipment and personnel will be provided by the Testing Laboratory. Deliveries of specimens and samples to the Testing Laboratory will be performed by the Testing Laboratory.
- B. Air samples shall be taken as follows:

<u>Area to be Sampled</u>	<u>When</u>	<u>Each Area</u>	<u>Minimum Sample Volume in Liters</u>	<u>Collection Rate</u>
Work Area	During removal or encapsulation work	Daily (4 per 8 hr. work shift)	120	@ 2 LPM
Area Immediately Adjacent to Work Areas	During removal or encapsulation work	Daily (4 per 8 hr. work shift)	1200	@ 10 LPM
Work Area	During sealing containment work	NONE REQUIRED	NONE REQUIRED	NONE REQUIRED

- C. Air Monitoring Clearance shall be as follows:

Type	Size	NYS DOL ICR 56	AHERA	NYS SED (2007 NEWSLETTER)	Combined Requirements	Aggressive Air Sampling Required
AHERA-SSSD Includes DOL Minor	<3lf or <3sf	None, Unless Part of Larger Project, Disturbance, or Loss of Integrity	None	Not Available	None, Unless Part of Larger Project, Disturbance, or Loss of Integrity	No, per AHERA
DOL Minor	>3lf or >3sf but <10lf & <25lf	None, Unless Part of Larger Project, Disturbance, or Loss of Integrity	Allows PCM 5 in, 2 blanks	PCM 5 in, 5 out, 3 blanks	PCM 5 in, 5 out, 3 blanks	Yes, per AHERA
DOL Small	>10lf & >25lf if but <160lf & <260lf	PCM 3 in, 3 out	PCM 5 in, 2 blanks	PCM 5 in, 5 out, 3 blanks	PCM 5 in, 5 out, 3 blanks	Yes, per AHERA & DOL
DOL Large AHERA PCM Limit	>160lf & >260lf	PCM 5 in, 5 out	TEM 5 in, 3 blanks	Follow AHERA	PCM 5 in, 5 out, 2-10 blanks per NIOSH AND TEM 5 in, 3 blanks	Yes, per AHERA & DOL

- D. No person involved in asbestos abatement work shall be exposed to greater than 8 hour time weighted asbestos fiber exposure levels or Instantaneous ceiling concentrations of asbestos fibers greater than the limits prescribed in OSHA 29 CFR 1910.1001 and 1926. Where such measures are discovered during testing, appropriate measures as prescribed by OSHA CFR 1910, 1910.1001 and 1926 shall be taken.
- E. Sampling for sealing and containment projects is only required as outlined in Items 4 and 5 above.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01612 - METHODS OF REMOVAL & TEMPORARY ENCLOSURE

PART I - GENERAL

1.01 WORK AREA PREPARATION:

The work area(s) shall be completely isolated from other parts of the building so as to prevent asbestos-containing dust or debris from passing beyond the isolated area. Should the area beyond the work area(s) become contaminated with asbestos-containing dust or debris as a consequence of the work, this contractor shall be responsible for cleaning, on a daily basis, those areas in accordance with all applicable codes. All costs incurred in cleaning, or otherwise decontaminating, non-work areas and the contents thereof shall be borne by the Contractor.

Note: Prior to initiating any preparation work, the Contractor shall verify that the Owner's Air Monitoring Firm has performed any necessary pre-test(s) as required by the New York State Labor Dept.

- A. The following preparations shall be conducted using approved respirators. However, the use of protective clothing during this phase is optional; the decision to use protective clothing should be based upon the degree of contamination found at the work site during visual observation and pre-testing.
 1. Inspection of rooms, shall be made by representatives of the Contractor and Owner before any work is initiated, to inventory and document any existing damage to components, such as furniture, fixtures, walls, doors, and radiator covers. All removable furniture and/or equipment shall be removed from the work area by the Contractor before commencing work. Furniture and equipment shall be pre-abatement cleaned before its removal from the work area. All non-removable furniture and equipment in the work areas shall be completely covered with two layers of polyethylene sheeting, at least 6 mil in thickness, securely taped in place with tape, in addition to critical barrier. All surfaces within the work area are to be precleaned.
 2. Signage: Asbestos caution signs shall be provided and displayed in accordance with Section 1910.1001 (g) of OSHA regulations and Part 56 Title 12 NYCRR. Signs shall be in language of all workers that contractor employs as well as any language known to be used and is reasonably common in the geographical area of the project. Refer to 1.05 of this Specification for additional information.
 3. Before the work is begun, the contractor shall clean with wet cloths, or if necessary with vacuum cleaner equipped with High Efficiency Particulate Absolute (HEPA) filters, all asbestos material. These items and equipment shall be removed from the work area and returned after the job has been completed and the work area has been decontaminated to the satisfaction of the

- owner's agent. Cloths and filters used for cleaning shall be disposed of as contaminated.
4. A "work area" that is contaminated, must be isolated from the balance of the building, and must be decontaminated at the completion of the asbestos-control work.
 5. The Contractor shall isolate the work area by building an approved decontamination facility or installing an approved decontamination trailer at all entrances and exits thereto. Work shall be divided into convenient work areas, each physically adjacent, there shall be a separate decontamination unit for each work area. Decontamination units shall have air lock design as required.
 6. The Contractor shall establish emergency procedures for each area and shall post written plans in areas readily available by employees. These plans shall include plans for medical emergencies, fire evacuation, temporary loss of electrical power and temporary breach of containment.
- B. The following preparations shall be performed in the stated order utilizing protective clothing and respirators. These respirators shall be at least PAPR type respirators approved by NIOSH for use in atmospheres containing asbestos.
1. The work areas shall be completely sealed off by erecting double barriers of fireproof polyethylene sheeting, at least 6 mil in thickness at all entrances and exits to the work area. The sheeting shall be secured to temporary framing with duct tape. The distance between the entrance and exit sheeting shall measure at least 3 feet, and the sheets, when closed, shall overlap the temporary framing so as to seal the opening. The sheets shall be weighted so that they quickly close after being released so that the work area shall always be sealed off by either the entrance or exit sheet. The integrity of all barriers shall be maintained until the project monitor/Owner grants permission for their removal.
 2. Detach and clean removable electrical, heating and ventilating equipment and other items connected to asbestos surfaces. These items shall be removed from the work area using decontamination procedures and returned to their proper place when the work area has been decontaminated.
 3. Wet clean all non-removable items; including built-in equipment, in the work area and cover with two thickness of 6-mil plastic sheeting taped securely in place.
 4. All walls and floors in the work area shall be covered with two layers of fireproof polyethylene sheeting, at least 6 mil in thickness each, taped securely in place to protect such surfaces from water damage, to prevent contamination of those surfaces, and maintained in place with duct tape. Tape all joints including the adjoining with the floor covering.

5. Floor and wall polyethylene plastic shall be overlapped one to the other. The first layer of floor sheeting shall extend up the wall a minimum of 12 inches. The second layer shall be extended up the side walls at least 24". No seams shall be located at the joints between walls and floors. Wall covering shall be securely fastened to the plastic floor covering. Walls and floors to be overlapping layers only; poly shall not be continuous from wall to floor or wall to ceiling. This method of overlap will help to protect floor surfaces from water damage and contamination. Wall cover shall overlap floor by at least 12".

NOTE: Plastic sheeting shall be a minimum of 6-mil fireproof polyethylene film for walls and 6-mil for sealing off corridors. A double thickness of 6-mil polyethylene film shall be used for all floors and critical barriers. All tape shall be high quality duct tape.

6. Temporary walls comprising critical barrier openings greater than 32 square feet in area are to be constructed with solid materials using 3/8" thick plywood sheathing in accordance with Part 56-8 (15). All joints to be airtight; install double layer of polyethylene sheeting as per note above.
7. All ventilation openings (supply and exhaust), lighting fixtures, clocks, doorways, convectors, and speakers, etc. shall be individually sealed with polyethylene sheeting at least 6 mil in thickness taped securely in place with duct tape until the entire operation including cleanup is completed. Care must be taken in sealing off lighting fixtures to avoid melting or burning of the sheeting. All appurtenances shall also be pre-abatement cleaned.
8. In order to avoid the potential tripping hazards created by wet plastic on stairs, the floors in stairway areas may remain unprotected by plastic.
9. However, other methods shall be used to protect and/or decontaminate these surfaces. These alternative methods shall be specified in writing and approved by the Owner before the work project begins.
10. Floor drains shall be sealed individually with two layers of 6-mil polyethylene and duct tape then the entire floor shall have a minimum of two thickness of 6-mil polyethylene sheeting.

NOTE: In the event that the adhesive material used to secure the plastic sheeting is found to be of insufficient strength to support the weight of the plastic barriers, then the Contractor shall so inform the A/E and receive direction as to a suitable stronger method of securing the plastic sheeting (e.g., spray-on adhesive, glue beads, horizontal wood battens). All securing procedures shall be of first class workmanship. The Contractor, at his expense, shall restore any and all damaged areas prior to completion of projects which occur as a result of barrier securing. All air handling systems serving the work area must be shut down and locked out.

11. Tools, scaffolding, staging, etc. necessary for the work shall be placed in the area to be isolated prior to erection of the plastic sheeting temporary enclosure.
 12. Prior to commencing work, the contractor shall submit to the Architect/Engineer for approval contingency plans for safe evacuation of the work area in case of fire.
 13. All electrical and mechanical items such as lighting fixtures, diffusers, registers, escutcheon plates, etc which cover the surface to be abated must be removed so as not to interfere with the work.
 14. All abatement area surface penetrations shall be completely sealed off including two layers of polyethylene sheeting, if applicable.
 15. Crawl space and basement corridor walls and ceilings shall be pre-cleaned and covered with two layers of polyethylene sheeting, if applicable.
 16. All sump pump and drainage systems shall be shut off and sealed prior to start up of abatement. If required, the Contractor shall provide a separate filtered pump system to remove wastewater from the abatement area.
 17. Temporary lighting of adequate illumination levels shall be provided by the Contractor for abatement and inspections.
 18. Remove filters from all heating, ventilation and air conditioning systems and pack them in sealable 6-mil minimum single thickness plastic bags, labeled for disposal as asbestos containing material waste. These bags should be handled in the same manner as removed asbestos. The filters should be replaced with new filters as a final step in the decontamination process (after the final washdown).
- C. As all existing ventilating systems in the work area are to be shut down and isolated (and positively pressurized to avoid ductwork contamination) and sealed throughout the removal operation, an alternate system must be utilized. (Existing system shall be critically barriered at all outlets or intakes plus two layers of plastic. If ductwork becomes contaminated as a result of incorrect abatement procedures, then all ductwork and systems shall be either decontaminated or removed and replaced by the Contractor.)
- D. Install approved negative air filtration units utilizing appropriate HEPA filters to exhaust air from the work area. These units shall be sized to achieve a rate of one air change every 15 minutes. The volume (in ft³) of the work area is determined by multiplying the floor area by the ceiling height. The required capacity of the ventilation system (in ft³/min) for the work area is determined by dividing this volume by the minimum air change rate, which shall be one air change every 15 minutes.

Thus: Required capacity of ventilation system in ft³ per min = volume of Work Area (in ft³) /15 min.

1. The number of Negative Air Filtration units needed for the application is determined by dividing the required capacity of the ventilation system as measured in ft³ min by the rated capacity of the Negative Air filtration units to be used.
 2. The power for negative air filtration units must be a temporary source connected through a ground fault circuit outside the work area.
- E. Shut down and lock out electric power to all work areas. All power to work areas shall be brought in from outside the area through a ground-fault interrupter at the source.
- F. All elevators in the work area shall be shut down and isolated.

1.02 CHANGING AREA (CLEAN ROOM)

- A. An isolated changing area shall be provided for the purpose of changing into protective clothing. It shall be constructed using polyethylene sheeting, at least 6 mil in thickness and located so that access to the work area shall be from the changing areas through the shower.
- B. Within the changing area, provide a suitable locker or acceptable substitute for storage of each worker's street clothing.

Note: It is recommended that a toilet facility, sink, and running hot and (at least) cold water be available in the changing area.

1.03 VISUAL BARRIER

- A. Where the work area is immediately adjacent and within view of occupied areas, a visual barrier of opaque polyethylene sheeting at least 6 mil in thickness shall be provided so that the work procedures are not visible to building occupants. Where the area adjacent to the work area is accessible to the public, construct a solid barrier on the public side of the sheeting to protect the sheeting. The barrier shall be constructed with wood or metal studs covered with minimum 1/2-inch thick hardboard. Where the solid barrier is provided, sheeting need not be opaque.

1.04 ALTERNATE METHODS OF ENCLOSURE

- A. Alternate methods of containing the work may be submitted by the Contractor to the Architect/Engineer for approval. Do not proceed with any such method(s) without written authorization of the Architect/Engineer.

1.05 SIGNS

- A. Post an approximately 20- by 14-inch manufactured caution sign at each entrance to the work area. The sign shall display the following legend with letter sizes and styles of a visibility at least equal to the following:

LEGEND

NOTATION

Asbestos	1 inch Block
Dust Hazard	3/4 inch Block
Avoid Breathing Dust	1/4 inch Gothic
Wear Assigned Protective Equipment	1/4 inch Gothic
Do Not Remain in Area Unless Your Work Requires It	1/4 Gothic
Breathing Asbestos Dust May Be Hazardous To Your Health	1/4 Point Gothic

Spacing between respective lines shall be at least equal to the height of the respective upper line.

- B. Post an approximately 10- by 14-inch manufactured sign at each entrance to each work area. The sign shall display the following legend with letter sizes and styles of a visibility at least equal to the following:

LEGEND

NOTATION

No Food, Beverages, or Tobacco Permitted	3/4 inch Block
All Persons Shall Don Protective Clothing (Coverings) Before Entering the Work Area	3/4 inch Block
All Persons Shall Shower Immediately After Leaving Work Area And Before Entering The Changing Area	3/4 inch Block

- C. Insure compliance with all requirements noted on the signs by all individuals entering the work area.

1.06 DECONTAMINATION UNIT

- A. For any project requiring either a remote decon unit or for full containment requiring a decon unit, the Contractor shall properly construct such a unit including opaque poly, 36 inch wide airlocks, bag holding rooms large enough to contain securable carts, full clean rooms, proper framing, double poly floors, lockable clean/waste holding rooms, shower areas, equipment rooms, etc. as required by governing codes including Industrial Code Rule 56, Subparts 56-9 and 56-10.

1.07 EMERGENCY PROCEDURES

- A. The Contractor shall post written emergency procedures near or within the clean room in all appropriate languages, read and signed by all workers employed on this project. These procedures should include, but not be limited to:

1. Location and phone numbers of police, fire, and medical emergency response teams.

2. Procedures to facilitate all such responses, e.g. EMT response to cardiac, heat stroke, injury victims within the work area.
3. Procedures in the event of fire in the work area.
4. Procedures in the event of an O₂ deficient atmosphere within the work area.
5. Procedures in the event of a water system failure (leakage) within the work area.
6. Procedures to avoid electrical hazards in the work area.
7. Procedures to avoid slips, trips, and falls in the work area.
8. Procedures to decontaminate injury victims.
9. Procedures to address short-term electrical power failure which affects negative air, lighting, and decontamination activities.
10. Procedures to address long-term electrical power failures.
11. Procedures in the event of a major critical barrier failure.
12. Procedures in the event high airborne fiber concentrations are exhibited during barrier air monitoring.
13. Procedures to address unanticipated discoveries of openings behind surfaces being abated.

1.08 ENCLOSURE INTEGRITY

- A. Upon completion of the construction of all plastic barriers and decontamination system enclosures, and prior to beginning actual abatement activities, twelve (12) hours settling shall be allowed to ensure the integrity of the enclosure.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01613 - ASBESTOS REMOVAL

PART 1 - GENERAL

Not Applicable

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 ASBESTOS

- A. Asbestos-containing materials to be removed shall be thoroughly wetted immediately prior to stripping and/or tooling to reduce fiber dispersal into the air. Wetting agent 50% polyoxyethylene ester and 50% polyoxyethylene ether, Aqua-Gro or equal, in a concentration of one (1) ounce in five (5) gallons of water (or as recommended by other approved manufacturers). The outer covering of any installation which has been painted and/or jacketed shall be perforated in order to allow penetration of the wetting agent, or, where feasible, carefully stripped away while simultaneously spraying the wetting agent on the installation to minimize dispersal of asbestos fiber into the air.
- B. A fine low pressure spray of this solution shall be applied to prevent fiber disturbance preceding removal. Saturate the material sufficiently to prevent emission of airborne fibers in excess of the exposure limits prescribed in the OSHA regulations. The wetted or amended water shall be sprayed on as many times and as often as necessary to ensure that the asbestos material is adequately wetted throughout (especially that asbestos nearest the substrate) to prevent dust emission as specified in the OSHA regulations. No dry removal of asbestos is allowable.
- C. Asbestos-containing material, which is stripped away or otherwise removed, shall be packed while still wet into plastic bags, 6 mil minimum thickness. Bags shall be sealed and placed into drums, covered and sealed for transport. The outside of all drums shall be cleaned before leaving the work area. Periodic cleanup and bagging of removed material while still wet and used coveralls, headcover, etc. shall be done to prevent accumulation of such material on the floor covering where traffic in the area may cause excessive air borne concentrations of the fibers. Stripped materials shall be sprayed as necessary to keep it wet until cleanup.

NOTE: For amosite-containing materials, a small test area shall first be tested with the specified wetting agent to determine material absorption. Inspection of rooms, shall be made by representatives of the Contractor and Owner before any work is initiated, to inventory and document an existing damage to components, such as furniture, fixtures, walls, doors, and radiator covers.

NOTE: Removal procedures may be amended per Applicable Variance AV85.

- D. Removal of the asbestos material shall be done in small sections by two-person teams, on staging platform if needed. The asbestos material shall not be allowed to drop a distance greater than 12 feet. In the event that the drop is greater than 12 feet to the floor a collection platform or chute may be used.
- E. A project supervisor or foreman shall remain on site whenever any type of work, including set up, is in progress. This supervisor's or foreman's name shall be provided to the Owner, Engineer, and Project and Air Monitors, and must be an English-speaking person. This person shall be ultimately responsible for maintaining the site, he shall also ensure that no one exits the work area before going through a proper decontamination process. He shall also ensure that all proper decontamination procedures are followed and that proper waste handling and storage procedures are followed.
- F. Contractor shall provide 24 hour notice to the Project Monitor for pre- and post-abatement inspections. No work may proceed prior to an inspection, and no lock down may proceed prior to an inspection including final air monitoring.
- G. As a method of organizing the asbestos removal work, workers, shall begin on the areas nearest to the decontamination unit and work toward the negative air filtration units. Also, to the extent possible, workers shall always face the negative air filtration units while removing asbestos materials. In this way asbestos fibers released by the process will be drawn away from the workers' breathing zones and towards the filtration units. The Contractor shall have on site an Emergency power source for the negative pressure units to ensure their continuous function in the event of a power failure. The wet material from each section shall be packed and sealed into labeled 6-mil plastic bags prior to starting the next section to prevent the material from drying. Water soaked fallen material shall not be left out of bags overnight, or for more than four hours to prevent loss of its water content due to evaporation. However, plastic bags will not be effective when wire lath and similar sharp-edged materials are involved in asbestos removal. Therefore, contaminated material containing sharp edged items shall be cut to size while adequately wet, placed in small cardboard boxes and double bagged, or singly bagged and then placed in temporary fiber drums. Bags and drums shall be marked with the label prescribed by Section 61.22 (c) of the EPA regulations. The outside of all containers shall be wet-cleaned or HEPA vacuumed before leaving work area. All vacuum cleaners shall be equipped with HEPA filters.

NOTE: 40 CFR 61.22 (j) prescribes a leak-tight container, the integrity of which is the Contractor's responsibility until after deposition at a sanitary landfill which is run in accordance with 40 CFR 61.25. Therefore, caution must be used in the choice of container types, and consideration given to the method of unloading at the landfill. Fragile containers shall be unloaded by hand to prevent rupture and possible airborne emissions.

- H. Negative air shall be maintained to provide four area air changes per hour. Contractor to supply containment volume measurements to the Project Monitor for verification. Air volumes are to be determined by metering the air flows at the machine exhaust outputs and a minimum static pressure differential of .02 inches of water shall be maintained between the inside and outside of the abatement area at all times. A minimum of two negative air machines shall be present in the work area at all times. All negative air machine exhaust ducting shall be monitored continuously by the Contractor to ensure proper system operation. Equipment shall operate continuously, 24 hours a day from beginning of set-up through clearance. At least one negative air unit shall be installed as a back-up to be used during filter changing and other unit failure.
- I. After completion of this removal phase (stripping), all surfaces from which asbestos has been removed shall be wire brushed and/or wet sponged or cleaned by an equivalent method to remove all visible asbestos containing material. During this work, the surfaces being cleaned shall be kept wet using amended water. All disposable equipment shall be packaged for disposal. Container shall be washed with amended water and shall have all exterior particulate matter removed prior to removal from the contaminated area.
- J. All work area barriers including decontamination unit barriers and waste decontamination unit barriers shall be inspected by the supervisor at least twice daily, and shall be documented in the project log book. Repairs shall be made immediately upon discovery and prior to resumption of abatement activities.
- K. All accessory equipment shall be moved to the equipment room in sealed containers (6-mil minimum) and decontaminated for removal.
- L. Watertight and securable waste holding carts shall be available in the bag holding area of the waste out decontamination unit.
- M. All free water (in container areas) shall be retrieved and added to asbestos contaminated waste and then placed in plastic lined drums.
- N. Power tools used to disturb asbestos material shall be equipped with HEPA filtered local exhaust.
- O. Final clean-up of work area may commence.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01614 - AIR MONITORING

PART 1 - GENERAL

1.01 AIR MONITORING

- A. The Contractor shall cooperate fully with all aspects of the air monitoring program which is conducted by an independent air monitoring firm responsible to the District. This Section is provided only as information to the Contractor.
- B. The independent air monitoring firm shall provide a qualified Asbestos Safety Monitor to observe the progress of the work to verify that the contractor's performance meets all state and federal regulations and is in compliance with this specification. The Asbestos Safety Monitor shall have the authority to direct the actions of the Contractor verbally, or in writing, to insure compliance.
- C. In addition, to the independent air monitoring firm hired by the District, the Contractor shall arrange for air monitoring to be conducted in all Work Areas in accordance with 29 CFR 1910.1001, and 1926 or OSHA regulations, on behalf of the Contractor's employees (at least on the first day of major removal work and in the event of major process changes). The Testing Laboratory shall be certified as proficient in asbestos analysis by AIHA or NOISH and employed by the Contractor. These personal samples shall be obtained from employees engaged in each of the following operations: asbestos removal, (i.e. spraying, scraping, brushing), disposal (i.e. bagging) and clean-up. Representative sampling shall be repeated in the event of major changes in the removal operation. This sampling shall be done with the sampling media and flow rates specified in NIOSH Method 7400. (Samples shall be taken for the determination of the 8-hour time weighted average airborne concentration and of the ceiling concentrations of asbestos fibers.
- D. The results of the Contractor's air monitoring shall be returned within two (2) working days, copies shall be provided to each employee monitored as specified by OSHA Regulations 29 CFR 1910.02 and 1926. The Contractor shall examine these results and evaluate the effectiveness of the controls in use (wet methods, exhaust units and respiratory protection). Copies of these monitoring tests shall be provided to the Owner's Asbestos Safety Monitor, as part of the documentation that the work has been completed. Copies shall also be made available, upon request to representatives of Local, State or Federal Enforcement agencies. Copies of these air monitoring results shall also be posted in a plainly visible location at the job site for the purpose of notifying the Contractor's employees. These shall be posted within one working day upon receipt of the results from the analytical laboratory.
- E. Air monitoring and visual inspection in and adjacent to the Work Area will be conducted on behalf off the Owner throughout the abatement project, and in accordance with this specification.

- F. The testing laboratory shall conduct all required analysis expeditiously and shall report the results of such tests to the Asbestos Safety Monitor. The Asbestos Safety Monitor upon receipt of testing results indicating concentrations above 0.01 fibers/cc have occurred outside the containment barriers or results above 0.02 f/cc within the clean room of the decontamination chamber during the abatement action, shall report these results within one working day to the Contractor, the owner and the A/E, so that prompt corrective action may be taken.
- G. The Asbestos Safety Monitor shall keep a daily log of on site observations concerning contractor's compliance with activities required under these job specifications. The log shall be made available upon request at all times to the owner, the A/E and the appropriate Local, State and Federal agencies. The Asbestos Safety Monitor shall report results in a comprehensive final report, including daily logs, observations and air monitoring results.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01615 - 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 opaque 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 REQUIRED 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 1 - GENERAL REQUIREMENTS

SECTION 01616 - 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 Sheetting 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 from 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 1 - GENERAL REQUIREMENTS

SECTION 01617 - 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 .02 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 1 - GENERAL REQUIREMENTS

SECTION 01618 - 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
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UNDERWRITERS LABORATORIES (UL)

UL 586 (1990)	High Efficiency, Particulate, Air Filter Units
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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 1926.1101 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 engaged 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:

<u>Legend</u>	<u>Lettering</u>
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

<u>Requirement</u>	<u>Test Standard</u>
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

<u>Requirement</u>	<u>Test Standard</u>
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 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 Penetrating Encapsulant

<u>Requirement</u>	<u>Test Standard</u>
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

<u>Requirement</u>	<u>Test Standard</u>
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 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 1 - GENERAL REQUIREMENTS

SECTION 01700 - CONTRACT CLOSEOUT

CONTENTS

1. Scope
2. Punch List and Final Inspection
3. Operations and Maintenance Instructions
4. Project Closeout Documents
5. Emergency Repairs
6. Certificate of Substantial Completion
7. Contractor's Guarantee

1. SCOPE

Prior to the release of final accrued retainage monies, the Contractor shall comply with the procedures for closing out the Construction Contract and to effect the project's transition to the Owner as summarized herein below.

2. PUNCH LIST AND FINAL INSPECTION

a. Preparation of Punch List:

1. When the Contractor determines that the project is substantially complete, he shall prepare a "Punch List" of the last items to be completed or corrected and shall notify the Owner in writing through the Architect that the project will be ready for a final inspection on a definite date which shall be stated in such notice. Such notification shall be given at least ten (10) days prior to the date stated for final inspection.
2. It shall be noted here, and emphasized, that preparation of the "Punch List" is a responsibility of the Contractor and not the Architect. The Architect's sole role will be that of an observer to assure that the design intent is carried out, and as an administrator of the Construction Contract.
3. The Contractor's failure to include an item of deficiency on the punch list issued to the Contractor shall not relieve the Contractor of its responsibility to perform its work in accordance with the Drawings and/or Specifications, and as such, the punchlist may be revised, updated, and/or reissued at any time.

b. Review and Substantial Completion:

The Architect will review the Contractor's "Punch List" and on the basis of his inspection will verify the condition of substantial completion and prepare the Certificate of Substantial Completion, A.I.A. Document G704.

c. Completion and Final Inspection:

1. Written notice shall also be given to the Architect by the Contractor upon completion of any work which, on the above stated final inspection, was determined to be incomplete, incorrect, or unsatisfactory and not to the stage of substantial completion. On receipt of such notice, additional inspection(s) will be made until completion of all contract requirements are effected. If the Architect is required to inspect the Contractor's work more than twice, the Contractor shall be liable to the Owner for the services performed by the Architect as a result of additional inspections.
2. The final inspection is intended to be a last review to determine that the work included in the contract has indeed been executed in accordance with all of the Contract Documents. Requests to render a final inspection of an incomplete building or to prepare the Contractor's "Punch List" will not be honored.

3. OPERATIONS AND MAINTENANCE INSTRUCTIONS

- a. The Contractor shall start up, test, adjust, balance and otherwise place in a satisfactory working condition all items of mechanical and electrical systems, and shall fully instruct representatives of the Owner in the care and operation of such systems.
- b. Instruction of the Owner's Maintenance Supervisor in the proper methods of cleaning and maintaining all the finished surfaces and the proper methods of replacement of the consumable items such as filters, light bulbs, washers, etc., shall be a part of this work.

4. CONTRACT CLOSEOUT DOCUMENTS

- a. After Execution of Certificate of Substantial Completion, and prior to submittal of Final Application for Payments, the Contractor shall submit the following documents to the Architect:
 1. Contractor's notarized affidavit that all payrolls, bill and materials, equipment, and other indebtedness connected with the work have been paid.
 2. Notarized Certificates of Waiver of Liens for himself, each Subcontractor, each material supplier or person furnishing materials or services to the project.
 3. List of subcontractors and major material suppliers including address, telephone number, and name of individual to contact.
 4. Validated warranties and notarized copies of all guarantees for equipment and materials specifically called for in the Contract Documents.

5. Consent of Surety to Final Payment.
 6. Fire Underwriters Certification (where applicable).
 7. Conformed Construction Drawings (As-builts), per section 01720.
 8. Record copy of each shop drawing or installation diagram.
 9. Operating manual (three (3) sets) assembled and bound, each containing:
 - a. Explanatory brochures of all equipment.
 - b. Catalog cut.
 - c. Wiring diagrams.
 - d. Instruction sheets for operation and maintenance.
 10. Guarantees:
 - a. Standard guarantee as per attached form.
 - b. Additional specific guarantees required by Technical Section of Contract Documents.
 - c. Manufacturer's warranties together with list of all items of equipment of material carrying warranty.
- b. Package all items properly indexed and deliver to Architect for review and transmittal to Owner.

5. EMERGENCY REPAIRS

During a valid warranty period, if the Contractor is unable or unwilling to respond immediately to make emergency repairs under conditions which the Owner may determine to be an emergency situation, the Owner reserves the right, and the Contractor recognizes such right, to make such emergency repairs and then to bill the Contractor for a fair and reasonable amount in reimbursement for such repairs.

6. CERTIFICATE OF SUBSTANTIAL COMPLETION

Certificate of Substantial Completion, A.I.A. Document G704, is included herein for review by the Contractor. This document shall be executed in triplicate when the work is sufficiently complete to warrant issuance of this document by the Architect.

7. The following two pages are the Contractor's Guarantee and shall be submitted along with the required Closeout Documents.

7. CONTRACTOR'S GUARANTEE

CONTRACTOR'S NAME AND ADDRESS

OWNER'S NAME AND ADDRESS

PROJECT: _____

LOCATION: _____

CONTRACT FOR: _____

CONTRACT DATE: _____

The Contractor hereby guarantees that all Work performed and/or materials installed under the above referenced contract is of the quality that will comply with all specific requirements of the contract documents and hereby insures the Owner against all defects of material for two (2) years and workmanship for a period of two (2) years from and after the date of Final Payment. This does not waive stipulation of other clauses which specify guarantee periods in excess of the obligations herein.

It is further agreed that if, after due inspection, the Architect, as provided in the General Conditions of the Contract for Construction, shall decide that the replacement or repair of any of the Work is, in his opinion, necessary, such defective Work will be repaired or removed and replaced with New Work, meeting all requirements of the Contract Documents, same being done promptly and without expense to the Owner. Repairs and replacements are to include all costs of replacing or repairing other work damaged by the removal and replacements of the work covered by this guarantee and all costs necessary for restoring any portion of the building and its contents which are damaged due to defects in this Contractor's Work or materials.

The Contractor agrees to perform all corrective work necessary promptly upon receipt of written notification from the Owner unless the Owner has previously given the Contractor a written acceptance of such condition.

The Contractor stipulates and agrees that if he fails or neglects to carry out promptly the provisions of this guarantee or any part thereof, the Owner may cause all defects to be remedied and all repairs to be made without further notice to the Contractor and shall charge to and recover the expense thereof from the Contractor and/or Sureties.

Such decisions as the architect shall render in connection with this guarantee are subject to the provisions of the General Conditions.

CONTRACTOR:

CORPORATE SEAL:

BY: _____

DATED: _____

STATE OF NEW YORK, COUNTY OF _____ ss:

On the _____ day of _____, 20____, before me personally came

_____, to me known, who being by me duly
sworn, did depose and say that he resides at

_____,
that he is the _____ of _____,
the corporation described in and which executed the foregoing instrument; that
he knows the seal of said corporation; that the seal affixed to said instrument
is such corporate seal; that it was so affixed by order of the Board of said
corporation, and that he signed his name thereto by like order.

STATE OF NEW YORK, COUNTY OF _____ ss:

On the _____ day of _____, 20____, before me personally came

_____, to me known, and known to me to be the
individual described in, and who executed the foregoing instrument, and _____
acknowledged to me that _____ executed same.

NOTARY PUBLIC, State of New York

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01710 - FINAL CLEANING

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE:

- A. Each prime contractor shall at all times during the progress of the work keep the building and site free from accumulation of rubbish.
- B. Each prime contractor shall provide final cleaning of those areas of site and structure (exterior and interior) involved in the work of his respective contract immediately before final inspection.

1.02 PROTECTION AND CONTROL

- A. Fire Protection:
 - 1. Store volatile waste removed in final cleaning in covered metal containers, and remove from premises to comply with local and/or state ordinances and OSHA.
 - 2. Gasoline and fuel oil storage facilities shall be located and maintained in full compliance with local and/or state ordinances and OSHA.
- B. Pollution Control:
 - 1. Conduct clean up and disposal operations to comply with local ordinances and/or state ordinances and OSHA anti-pollution laws.
 - 2. Burning or burying of rubbish and waste materials on the project site is not permitted.
 - 3. Disposal of volatile fluid wastes (such as mineral spirits, oil, or paint thinner) in storm or sanitary sewer systems or into streams or waterways is not permitted.

PART 2 - PRODUCTS

2.01 CLEANING MATERIALS:

- A. Use only cleaning materials recommended by manufacturer or surface to be cleaned.
- B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.01 FINAL CLEANING:

- A. General:
 - 1. Use experienced workmen, or professional cleaners, for final cleaning.
 - 2. Maintain cleaning until the building, or portion thereof, is occupied by the Owner.
- B. Remove grease, dirt, dust, stains, labels, fingerprints, and other foreign materials, from interior and exterior surfaces.
- C. Repair, patch, and touch up marred surfaces to match adjacent finishes.
- D. Wash all glass installed as work of this contract.
- E. Clean transparent and glossy materials to a polished condition; remove foreign substances. Polish reflective surfaces to a clear shine.
- F. Vacuum clean carpeted and similar soft surfaces.
- G. Clean resilient and hard surface floors as recommended by manufacturer.
- H. Clean surfaces of equipment; remove excess lubrication.
- I. Clean permanent filters of ventilating equipment and replace disposable filters when units have been operated during construction; in addition, clean ducts, blowers, and coils when units have been operated without filters during construction.
- J. Clean light fixtures and lamps.
- K. Remove waste, foreign matter, and debris from roofs, gutters, areaways, and drainage systems.
- L. Remove waste, debris, and surplus materials from site. Clean grounds; remove stains, spills and foreign substances from paved areas and sweep clean. Rake clean other exterior surfaces.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01720 - 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

DIVISION 3 - CONCRETE

SECTION 03651 - SELF-LEVELING GYPSUM-PORTLAND CEMENT 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
 - 2. Section 09300 - Ceramic Tile
 - 3. Section 09650 - Resilient Flooring
 - 4. Section 09657 - Resilient Sheet Flooring
- B. For LEED Projects:
 - 1. Division 1 Section "*LEED Requirements*".
 - 2. Division 1 Section "*Construction Waste Management*" for recycling construction waste.

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 underlayment in accordance with the Contract Documents.
- 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 shall be "Ardex GS-4" as manufactured by Ardex, Inc., 400 Ardex Park Dr, Aliquippa PA 15001 (Allison Birkmeyer 724-777-2799).

1. Installation of gypsum cement-based, self-leveling underlayment 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 a featheredge to 2" in one pour and up to 5" thick in small areas.
3. Underlayment shall be walkable after 2-3 hours at 70°F and allow floor covering to be installed after 2-3 days.
4. Underlayment compressive strength shall be 4000 psi per ASTM C109/mod (air cure only)
5. After proper substrate preparation, underlayment shall be suitable for use over the following substrates.
 - a. Rehabilitation projects: structurally sound plywood, OSB and strip wood flooring.

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 GS-4 is a gypsum-based material. Do not install in application on or below grade or in any areas subject to high moisture conditions. 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 gypsum cement-based self-leveling, underlayment or patching material shall be:
 - a. Ardex GS-4 self-leveling underlayment (for all standard above grade self-leveling).
 - b. Technical Data: All data is based on a mixing ratio of 4 parts powder to 1 part by volume 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 60 minutes
 - iv. Compressive Strength, ASTM C-109/mod:4000 psi(28 days)
 - v. Flammability, ASTM E84-81a:

Flame Spread	-0-
Fuel Contribution	-0-
Smoke Development	-0-
 - vi. Coverage: Approx. 22 sq.ft. per bag at 1/4", 11 sq.ft. per bag at 1/2".
 - vii. Warranty: Ardex Engineered Cements Warranty - 5 years.
2. Primer for standard absorbent concrete and wood subfloors shall be Ardex P-51 Primer.
3. Water shall be clean, potable, and sufficiently cool (not warmer than 70°F).
4. 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

2.02 MIX DESIGNS

A. Ardex GS-4 Self-Leveling Underlayment

1. Standard mixing ratio: Ardex GS-4 shall be mixed in 2-bag batches at one time. Mix each bag of Ardex GS-4 (50 lb.) with 4 quarts of water. Product shall be mixed in T-10 mixing drum using a T-4 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 GS-4 bag label.

2. For pump installations, Ardex GS-4 shall be mixed using the Ardex Levelcraft Automatic Mixing Pump. Start the pump at 130 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. 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.
 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. Mechanically clean if necessary using shot blasting or other methods. **Acid etching and the use of sweeping compounds and solvents are not acceptable.**
 2. Wood subfloors must either be solid hardwood flooring, a minimum of 3/4" tongue-and-groove, APA rated Type 1, Exterior Exposure plywood, or approved OSB underlayment board. Wooden subfloors must be clean and free of all foreign matter. Any boards exhibiting movement must be re-nailed. The surface of the wood

must be clean and free of oil, grease, wax, dirt, varnish, shellac, or any contaminant that might act as a bond breaker. If necessary, sand down to bare wood; do not use solvents, strippers or cleaners. Vacuum all dust and debris.

- a. Note: Ardex SDF Feather Finish shall be used to fill in the seams in strip wood so the Ardex GS-4 Self Leveling Underlayment does not flow in to the seams.
3. It is the responsibility of the installation contractor to ensure that the subfloor is thoroughly clean and properly anchored prior to the installation of the Ardex material.
4. All cracks and non-moving joints in the subfloor shall be repaired to minimize telegraphing through the underlayment.
5. 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.

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 wood subfloors:
 1. Prime with Ardex P-51 Primer Concentrate and apply directly to the wood. Do not dilute. 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 bare spots. Brush off puddles and excess primer. Allow drying to a thin, clear film (max. 24 hours).

3.05 APPLICATION OF ARDEX GS-4:

- A. Installation:
 1. Pour or pump the liquid Ardex GS-4 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 GS-4. Underlayment can be walked on in 3 hours at 70° F.

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 after 2-3 days 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 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. 07231 - Air / Vapor Barrier System
 - 6. 07600 - Flashing and Sheet Metal
 - 7. 07900 - Caulking
 - 8. 07910 - Joint Sealers
 - 9. 08110 - Steel Doors and Frames
 - 10. 08121 - FRP Doors and Framing
 - 11. 08211 - Flush Wood Doors
 - 12. 08360 - Upward Acting Sectional Doors
 - 13. 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 uncured or unfroged 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. Silica: 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 repellent 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 $\frac{1}{4}$ 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**, 1/2" 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 1/2-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 $\frac{1}{2}$ " wide and filled with appropriate caulk.

b. Control joint spacing for exterior and interior walls:

<u>Wall Height (FT)</u>	<u>Horizontal Joint reinforcing 16" O.C.</u>
-------------------------	----------------------------------------------

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 $\frac{1}{2}$ " with nominal $\frac{3}{4}$ " diameter polyethylene backer rod compressed and installed into joint with minimum of $\frac{1}{4}$ " 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 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 electrodeposited 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 (transverse 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 tapping 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 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 chlorpyrifos 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 AWPB 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 AWPB 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 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07255 - CEMENTITIOUS FIREPROOFING

PART 1 - GENERAL

1.01 SUMMARY

- A. Work under this section consists of the furnishing of all labor, materials, equipment, and services necessary for, and incidental to, the complete and proper installation of all cementitious fireproofing and related work as shown on the drawings or specified herein, and in accordance with all applicable requirements of the contract documents.
- B. Conform to all applicable building code requirements of all authorities having jurisdiction.

1.02 RELATED SECTIONS

- A. Section 03310 - Concrete Work.
- B. Section 05120 - Structural Steel.
- C. Section 05300 - Metal Deck.

1.03 REFERENCES

- A. American Society of Testing Materials (ASTM):
 - 1. ASTM E 84 - Surface Burning Characteristics.
 - 2. ASTM E 119 - Standard Methods of Fire Tests of Building Construction and Materials.
 - 3. ASTM E 605 - Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material Applied to Structural Members.
 - 4. ASTM E 736 - Cohesion/Adhesion of Sprayed Fire-Resistive Material Applied to Structural Members.
 - 5. ASTM E 759 - Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members.
 - 6. ASTM E 760 - Effect of Impact on Bonding of Sprayed Fire-Resistive Material Applied to Structural Members.
 - 7. ASTM E 761 - Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members.
 - 8. ASTM E 859 - Air Erosion of Sprayed Fire-Resistive Material Applied to Structural Members.
 - 9. ASTM E 937 - Corrosion of Steel by Sprayed Fire-Resistive

Material Applied to Structural Members.

10. ASTM E 1354 - Cone Calorimeter.
 11. ASTM G 21 - Standard Practice for Determining Resistance of Polymeric Materials to Fungi.
- B. Bureau of Building Inspection: City of San Francisco.
1. Abrasion Resistance Test Method.
 2. Impact Penetration Test Method.
- C. UL X854 Underwriters Laboratories, Inc. (UL), Fire Resistance Directory (Latest Edition).
- D. Uniform Building Code (UBC):
1. UBC Standard No. 7-6: Thickness and Density Determination for Spray-applied Fireproofing.
 2. UBC Standard No. 7-7: Methods for Calculating Fire Resistance of Steel, Concrete, and Wood Construction.
- E. Uniform Mechanical Code (UMC) Standard 6-1.

1.04 DEFINITIONS

- A. Cementitious Fireproofing as defined by Underwriters Laboratories, Inc., (CALV) in the latest edition of the UL Fire Resistance Directory.

1.05 SUBMITTALS

- A. Manufacturer's Data: Submit manufacturer's instructions for proper application of cementitious fireproofing.
- B. Fire Testing: Submit evidence that the cementitious fireproofing has been subjected to full-scale ASTM E 119 fire testing at Underwriters Laboratories, Inc., by the manufacturer.
- C. Thickness Schedule: Provide schedule indicating material to be used, building elements to be protected with spray-applied fireproofing, hourly rating and material thickness provided, and appropriate references.
- D. Test Data: Independent laboratory test results for fireproofing shall be submitted for the following performance criteria:
1. Bond Strength per ASTM E 736.
 2. Compressive Strength as per ASTM E 761.
 3. Deflection per ASTM E 759.
 4. Bond Impact per ASTM E 760.

5. Air Erosion per ASTM E 859.
6. Corrosion Resistance per ASTM E 937.
7. Abrasion Resistance (Test Method developed by the City of San Francisco, Bureau of Building Inspection).
8. Impact Penetration (Test Method developed by the City of San Francisco, Bureau of Building Inspection).
9. High Speed Air Erosion per UMC Standard 6-1 and ASTM E 859.
10. Surface Burning Characteristics per ASTM E 84.
11. Combustibility per ASTM E 1354 Cone Calorimeter.
12. Mold Resistance per ASTM G 21 and UMC Standard 6-1.

1.06 QUALITY ASSURANCE

- A. Fireproofing work shall be performed by a firm acceptable to the cementitious fireproofing material manufacturer.
- B. Products, execution, and fireproofing thicknesses shall conform to the applicable code requirements for the required fire-resistance ratings.
- C. Contractor, fireproofing subcontractor, and independent testing laboratory shall attend a pre-installation conference to review the substrates for acceptability, method of application, applied thicknesses, inspection procedures, and other issues.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Material shall be delivered in original unopened packages, fully identified as to manufacturer, brand, or other identifying data and bearing the proper Underwriters Laboratories, Inc., labels for Surface Burning Characteristic and Fire Resistance Classification.
- B. Material shall be stored off the ground, under cover, and in a dry location until ready for use. All bags that have been exposed to water before use shall be found unsuitable and discarded. Stock of material is to be rotated and used prior to its expiration date.

1.08 PROJECT/SITE CONDITIONS

- A. A minimum air and substrate temperature of 4.4°C (44°F) shall be present before application of spray-applied fireproofing. A minimum air and substrate temperature of 4.4°C (44°F) must be maintained during and for 24 hours after application of the spray-applied fireproofing. Provide enclosures with heat to maintain temperature.
- B. Provide ventilation in poorly ventilated areas to achieve a minimum

total air exchange rate of 4 times per hour until the material is substantially dry.

1.09 SEQUENCING AND SCHEDULING

- A. Sequence and coordinate application of cementitious fireproofing with work in other sections which would interfere with efficient fireproofing application.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Design is based on "Monokote Type MK-6/CBF" cementitious fireproofing as manufactured by Grace Construction Products, W.R. Grace and Co. Equal products of other manufacturers, approved in advance by the Architect, may be substituted.
- B. Physical Performance Characteristics: Fireproofing material shall meet the following physical performance standards:
 - 1. Dry Density: The field density shall be measured in accordance with ASTM Standard E 605. Minimum average density shall be that listed in the UL Fire Resistance Directory for each rating indicated, ICBO Evaluation Report, as required by the authority having jurisdiction, or minimum average 240 kg/cubic meter (15 pcf), whichever is greater.
 - 2. Deflection: Material shall not crack or delaminate from the surface to which it is applied when tested in accordance with ASTM E 759.
 - 3. Bond Impact: Material subject to impact tests in accordance with ASTM E 760 shall not crack or delaminate from the surface to which it is applied.
 - 4. Bond Strength: Fireproofing, when tested in accordance with ASTM E 736, shall have a minimum average bond strength of 9.6 KPa (200 psf) and a minimum individual bond strength of 7.2 KPa (150 psf).
 - 5. Air Erosion: Maximum allowable total weight loss of the fireproofing material shall be .05 gms/square meter (.005 grams/ft²) when tested in accordance with ASTM E 859. Sample surface shall be "as applied" (not pre-purged) and the total reported weight loss shall be the total weight loss over a 24 hour period from the beginning of the test.
 - 6. High Speed Air Erosion: Materials to be used in plenums or ducts shall exhibit no continued erosion after 4 hours at an air speed of 12.7 m/s (47 km/h) (2,500 ft/min [29 mph]) when tested in accordance with the UMC Standard 6-1 and ASTM E 859.
 - 7. Compressive Strength: The fireproofing shall not deform more than 10 percent when subjected to compressive forces of 57 Kpa

(1,200 psf) when tested in accordance with ASTM E 761.

8. Corrosion Resistance: Fireproofing applied to steel shall be tested in accordance with ASTM E 937 and shall not promote corrosion of steel.
 9. Abrasion Resistance: No more than 15 cm³ shall be abraded or removed from the fireproofing substrate when tested in accordance with the test methods developed by the City of San Francisco, Bureau of Building Inspection.
 10. Impact Penetration: The fireproofing material shall not show a loss of more than 6 cm³ when subjected to impact penetration tests in accordance with the test methods developed by the City of San Francisco, Bureau of Building Inspection.
 11. Surface Burning Characteristics: Material shall exhibit the following surface burning characteristics when tested in accordance with ASTM E 84:
 - a. Flame Spread: 0.
 - b. Smoke Development: 0.
 12. Resistance to Mold: The fireproofing material shall be formulated at the time of manufacturing with a mold inhibitor. Fireproofing material shall be tested in accordance with ASTM G 21 and shall show resistance to mold growth for a period of 21 days for general use and 60 days for materials to be installed in plenums.
 13. Combustibility: Material shall have a maximum total heat release of 20 MJ/m² and a maximum of 125 kw/m² peak rate of heat release 600 seconds after insertion when tested in accordance with ASTM E 1354 at a radiant heat flux of 75 kw/m² with the use of electric spark ignition. The sample shall be tested in the horizontal orientation.
- C. Fire Resistance Classification: The spray-applied fireproofing material shall have been tested and reported by Underwriters Laboratories, Inc., in accordance with the procedures of ASTM E 119 and shall be listed in the Underwriters Laboratories Fire Resistance Directory.
- D. Mixing water shall be clean, fresh, and suitable for domestic consumption and free from such amounts of mineral or organic substances as would affect the set of the fireproofing material. Provide water with sufficient pressure and volume to meet the fireproofing application schedule.

2.03 ACCESSORIES

- A. Provide accessories to comply with manufacturer's recommendations and to meet fire resistance design and code requirements. Such accessories include, but are not limited to, any required or optional

items such as "Spatterkote" bonding agents, mechanical attachments; application aids such as metal lath, scrim, or netting; and "Monokote Accelerator".

2.04 SOURCE QUALITY CONTROL

- A. Submit evidence that cementitious fireproofing has been tested per ASTM E 119 by Underwriters Laboratories, Inc. Include evidence that fire testing was sponsored by the manufacturer and that the material tested was produced at the manufacturer's facility under the supervision of Underwriters Laboratories, Inc., personnel. Letters documenting classification status are not acceptable evidence of compliance with this section.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. All surfaces to receive spray-applied fireproofing shall be provided free of oil, grease, paints/primers, loose mill scale, dirt, or other foreign substances which may impair proper adhesion of the fireproofing to the substrate. Where necessary, cleaning or other corrections of surfaces to receive fireproofing shall be the responsibility of the supplier of the incompatible substrate.
- B. Application of the fireproofing shall not begin until the contractor, applicator, and fireproofing testing laboratory (inspector) have examined surfaces to receive fireproofing and determined that the surfaces are acceptable to receive the fireproofing material.

3.02 PREPARATION

- A. Prior to application of the fireproofing material, a bonding agent, approved by the fireproofing material manufacturer, shall be applied to all concrete substrates to receive fireproofing.
- B. Other trades shall install clips, hangers, support sleeves, and other attachments required to penetrate the fireproofing, prior to application of the fireproofing materials.
- C. Other trades shall not install ducts, piping, equipment, or other suspended items until the fireproofing is complete.
- D. Complete placing of concrete on floor and roof decking prior to application of the fireproofing to the underside of the steel deck and supporting beams and joists.
- E. On roof decks without a concrete cover, complete all roofing applications and roof mounted equipment installation prior to application of the fireproofing to the underside of the roof decking and supporting beams and joists. Prohibit all roof traffic upon commencement of the fireproofing and until the fireproofing material is dry.

- F. Protection of permanently exposed walls or floor or special surfaces.

3.03 APPLICATION

- A. Equipment and application procedures shall conform to the material manufacturer's application instructions.
- B. Post appropriate cautionary "Slippery When Wet" signs in all areas in contact with wet fireproofing material. Erect appropriate barriers to prevent entry by non-fireproofing workers into the fireproofing spray and mixing areas and other areas exposed to wet fireproofing material.
- C. Apply a discontinuous textured spray of W.R. Grace & Co. - Conn. "Spattekote" in accordance with manufacturer's instructions to all cellular steel floor units with flat plate on the bottom and to roof deck assemblies as required to meet the fire resistance ratings, before application of the "Monokote" fireproofing to these surfaces.

3.04 FIELD QUALITY CONTROL

- A. The Architect will select, and the Owner will pay an independent testing laboratory to randomly sample and verify the thickness and the density of the fireproofing in accordance with provisions of ASTM E 605, or the "Inspection Procedure for Field-applied Sprayed Fire Protection Materials" as published by the Association of Wall and Ceiling Contractors International (AWCI), or the Uniform Building Code Standard No. 7-6. Where density samples are of irregular shape, a displacement method approved by Underwriters Laboratories, Inc., shall be used to determine in place fireproofing density.
- B. The Architect will select, and the Owner will pay an independent testing laboratory to randomly sample and verify the bond strength of the fireproofing in accordance with provisions of ASTM E 736.
- C. The results of the above tests shall be made available to all parties at the completion of pre-designated areas which shall have been determined during the pre-job conference.

3.05 CLEANING

- A. After the completion of fireproofing work, application equipment shall be removed.
- B. Except as detailed in Section 3.02F, floors shall be left in a scraped condition.

3.06 PATCHING

- A. All patching and repair of spray-applied fireproofing, due to damage by other trades, shall be performed with same materials under this section, and paid for by the trade(s) responsible for the damage.

END OF SECTION

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07542 - TPO ROOFING SYSTEM - Fully Adhered

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Related Documents:

1. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Extent of Work:

1. Provide and install a Fully Adhered TPO System where shown on the drawings and specified herein. Work shall include, but not be limited to the following:
 - a. Furnish and install TPO roofing system with flashings and all other incidental and accessory items to comprise a complete roofing system.
 - b. Removal and legal disposal of all existing roofing, cover board, insulation, vapor barrier and membranes or plies down to the structural steel deck.
 - c. Re-Securement of the decking; where applicable.
 - d. Mechanically fasten the first layer of insulation to the steel deck. Attach subsequent layers of insulation and cover board to the mechanically attached first layer.
 - e. New wall and base flashing, expansion joints.
 - f. Cleaners, adhesives, sealants, seaming tapes, tape primers and fasteners.
 - g. Flashing of all new roof penetrations.
 - h. New gravel stops, wall copings and/or counter flashing and termination bars.
 - i. Miscellaneous sheet metal or metal flashing.
 - j. Provision and installation of new drains, connecting piping, and insulation where indicated.
 - k. Manufacturer's guarantee.

- l. 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.
- m. Installation of new equipment curbs where indicated.
- n. Walkway pads where indicated.
- o. Provision of new tapered cants as required to meet new blocking at perimeter edges.
- p. Raising existing or installing new roof hatches as required to 8" above finish roof, as a result of the work required to raise finished roof surfaces.
- q. Raising existing skylights or installing new as required to 8" above finish roof, as a result of the work required to raise finished roof surfaces.
- r. Raising existing rooftop mechanical equipment curbs or installing new 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.

C. Related Work/Requirements Specified Elsewhere:

- 1. Section 01020 - Allowances (if incorporated)
- 2. Section 06100 - Rough Carpentry
- 3. Section 07600 - Flashing and Sheet Metal
- 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 him/herself 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/she shall include all such applicable alternates in his proposal.

1.04 REFERENCES

- A. Factory Mutual (FM) Engineering Corporation - Roof Assembly Classifications.
- B. Building Code of New York State
- C. FS HH-I-526 - Insulation Board, Thermal (Mineral Fiber)
- D. FS HH-I-529 - Insulation Board, Thermal (Mineral Aggregate)
- E. FS HH-I-530 - Insulation Board, Thermal (Urethane)
- F. FS HH-I-551 - Insulation Block and Boards, Thermal (Cellular Glass)
- G. FS LLL-I-535 - Insulation Board, Thermal (Cellulosic Fiber)
- H. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual
- I. Underwriters Laboratories (UL) - Fire Hazard Classifications
- J. Sheet Metal and Air-Conditioning Contractors National Association, Inc. (SMACNA)
- K. CGSB 37GP56M Classification: Type 2, Class C, Grade 1

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 an approved equal by the Architect.
- B. System Description: Base ply insulation, tapered insulation, cover board, and a single ply TPO Fleeceback membrane system. All products must be from the membrane manufacturer. Include all membrane manufacturer's 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.
- B. Manufacturer's product data sheets and installation instructions on all materials proposed for use.
- C. Specimen copy of the manufacturer's standard 20-year NDL roofing warranty.
- D. U.L. and F.M. compliance data: Contact roofing manufacturer for information.
- E. Shop drawings indicating setting plan for tapered insulation. Exact locations of drains must be field verified prior to submittal.
- F. Submit two 12-inch square samples of membrane illustrating the color and thickness 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.

1. Complete configuration of existing roof indicating layout of membrane sheets, seams between sheets, and location and type of all roof penetrations.
 2. Complete details for attaching membrane at perimeter of roof, flashing of roof penetrations, blocking configurations, & other special details as required. This shall include, but not be limited to pre-manufactured gravel stops and copings. Note: Shop or Field-fabricated gravel stops & copings will not be permitted.
 3. Complete layout of all tapered insulation indicating compliance with drainage patterns as shown on the drawings.
- J. Submit list of at least five (5) successfully completed roofing projects using each of the TPO 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 TPO 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 TPO 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.

6. Provide evidence of CERTA training for any installer of torch-applied modified bitumen membrane. Copies of certifications are required prior to award and must be maintained on the jobsite for inspection at any time.

1.08 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 as per above.**
2. **Roofing applicator must have installed and successfully completed at least (5) five roofs of the same materials and methods specified for this project, completed over the last five years. Submit certifications from manufacturer pursuant to above section.**
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.**
5. **The contractor must have at least five (5) years of manufacturer-certified experience in installing commercial scale TPO 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.**
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.**

B. Manufacturer's Qualifications:

1. The roofing system manufacturer must have a minimum of 10 years' experience in the marketing of TPO.

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 at 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 an NDL warranty (See paragraph 1.14 - "Warranty and Guarantees") 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.

1.09 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./l.f. outward load in accordance with ANSI/SPRI ES1-98 Wind Design Standards Test Method RE-3; and
 - 2. Exceed 120 lbs./l.f. upward load in accordance with ANSI/SPRI ES1-98 Wind Design Standards Test Method RE-3.

1.10 PRELIMINARY / PRE-INSTALLATION ROOFING CONFERENCE

- A. 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.
- B. 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.
- C. Provide evidence of CERTA training for any installer of torch-applied modified bitumen membrane. Copies of certifications are required prior to award and must be maintained on the jobsite for inspection at any time.

1.11 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.
- 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.
- G. Properly tie down insulation to prevent blow off. No material is to be stored on the roof at any time.
- 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 all materials in a manner so as 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.
 2. Store all materials on raised platforms cover with properly secured breathable water-resistant covers. Slit shrink wrapping to not permit condensation and cover with breathable tarp.
 3. 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.
 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.

1.12 QUALITY ASSURANCE

- A. Submit certification by the manufacturer of the system materials used that these specifications and drawing details are acceptable to them for the deck and surfacing to which they are to be applied.
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.
- B. TPO Roofing Applicator Requirements: refer to 1.08A of this Section.
- C. TPO Roofing Manufacturer Requirements: refer to 1.08B of this Section.

- D. Material Requirements / Source Limitations:
1. Obtain all membrane sheets, flashings, prefabricated gravel stops and copings, all temporary roof materials and all surface coatings from a single manufacturer.
- E. UL Rating:
1. Provide TPO membrane and insulation that has been classified by Underwriters Laboratories as a component of Class A roofing system.
- F. Wind Uplift:
1. **Design adhered roofing systems and blocking configurations and attachments are to meet Factory Mutual wind uplift criteria (Factory Mutual Systems Loss Prevention Data Sheet 1-28). Refer to Article 1.09 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 by the roofing manufacturer.
- H. Test Reports: Provide:
1. **Roof drain and leader test or submit plumber's verification.**
- 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.

1.13 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 Total System / No Dollar Limit 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-inch-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.
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 weather conditions are in compliance with manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with requirements and the manufacturer's recommendations.

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 workday, or when weather conditions outside manufacturer's recommended limits are predicted, provide and install temporary water stops as recommended by the roofing manufacturer.
 - a. Permanent roof insulation shall not be installed as base for temporary water stops.
 - b. Remove temporary water stops completely before installing permanent roofing system.

1.14 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 No Dollar Limit (NDL) 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. Guarantee to cover membranes, flashings, insulation, expansion joints, adhesives, sealants, fasteners, fascia's and all materials installed as part of the roofing installation.
 - 1. **Guarantee shall include a wind rider for the repair of damages to the roofing system caused by winds up to and including three second gust of 120 MPH, 33 feet off the ground as defined by the 2015 International Building Code as adopted by New York State.**
- C. These specifications may require more than what the manufacturer may require for providing a warranty for the roofing system. The specification where more stringent will take precedent.
- 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.
- 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. The Contractor is to guarantee all work against defects in materials and workmanship as per Section 01700 of this specification following final acceptance of the work.

1.15 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.

1.16 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 **GENERAL**

- 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. 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, approved by the Architect. Equal products from GenFlex Building Products or Mulehide Products.**
- 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 THERMOPLASTIC POLYOLEFIN ROOFING MEMBRANE

- A. Fabric-Reinforced Thermoplastic Polyolefin Sheet: ASTM D 6878, uniform, flexible sheet formed from a thermoplastic polyolefin, internally fabric or scrim reinforced. **Product: JM TPO**
 - 1. Thickness: 60 mils (1.5 mm), nominal.
 - 2. Color: White.
- B. Typical Physical Properties
 - 1. Energy and the Environment
 - a. ENERGY STAR® (White Membrane) Reflectivity: Pass
 - b. Reflectivity: 0.78
 - c. Title 24 (White Membrane) Reflectivity: Pass
 - d. Reflectivity: 0.77
 - e. ASTM C 1371, Emissivity: 0.87

- f. LEED® (White Membrane) Reflectivity: Pass
 - g. Reflectivity: 0.78
 - h. ASTM E 408, Emissivity: 0.90
 - i. SRI of 101 as tested by ASTM E 1980
- 2. ASTM D 751, Weight: 0.290 lb/ sq ft
 - 3. ASTM D 751, Thickness: 0.060 in. (1.52 mm)
 - 4. ASTM D 751, Tolerance on Nominal Thickness: +/- 10%
 - 5. ASTM D 6778 Annex A, Thickness over scrim, 0.025 in. (.064mm)
 - 6. ASTM D 751 Breaking Strength Grab Method, Min
 - a. Machine Direction: 320 lbf (1,423.36 N)
 - b. Cross Machine Direction: 270 lbf (1,200.96 N)
 - 7. ASTM D 751, Factory Seam Strength, Cross Machine Direction: 140 lbf (624 N)
 - 8. ASTM D 751, Elongation at Break: 42.41% MD and 34.93% XMD
 - 9. ASTM D 751, Tearing Strength, Min
 - a. Machine Direction: 89.9 lbf (339.45 N)
 - b. Cross Machine Direction: 184 lbf (821.14 N)
 - 10. ASTM D 2137, Brittleness Point, Max.: Pass @ -40 C
 - 11. ASTM D 1149, Ozone Resistance, No visible cracks: Pass
 - 12. ASTM D 573, Heat Aging, 90% Retention of Breaking Strength and Elongation at Break: Pass
 - 13. ASTM D 471, Water Absorption, Max: 0.7 Mass %
 - 14. ASTM E 96, Water Vapor Permeance: 0.01 Perms
 - 15. ASTM D 751 Hydrostatic Resistance: 430 psi
 - 16. ASTM D 1204, Linear Dimensional Change, Max: 0.4%
 - 17. FTM 101C Method 2031, Puncture Resistance: 380 lb.

2.03 MEMBRANE SPRAYABLE BONDING ADHESIVES

- A. Bonding Adhesive: Manufacturer's standard low VOC Spray bonding adhesive for membrane, and solvent-based bonding adhesive for Flashings. Product: **JM TPO All Season Sprayable Bonding Adhesive**
 - 1. Install when ambient temperature is 25°F and rising and with the adhesive canister temperature at a minimum 70°F
 - 2. Ensure all surfaces are dry, clean and free of debris prior to application
 - 3. Two-sided sprayable aerosol adhesive for hot or cold applications with fast drying properties in a pressurized canister.

2.04 FLASHING

- A. JM TPO membrane flashing.

2.05 FASTENING STRIP

- A. Aluminum Bar, 1-1/2 inches by 1/8 inch. Pre-punched for fasteners, spacing maximum 12 inches on center.

2.06 TERMINATION STRIP

- A. Polyester reinforced termination strip, 5 inches wide with a 3-inch self-adhering seam tape.
- B. Tensile strength; 75 psi, peel strength; 8-10 psi.

2.07 LAP SEALANT

- A. Lap sealant for sealing exposed edges of splices. Trowel or gun consistency.

2.08 WATER CUTOFF MASTIC

- A. One-component, low viscosity, self-wetting butyl blend that has been designed for compatibility with TPO membrane.

2.09 Miscellaneous Accessories: Provide pourable sealers, primers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, cover strips, and other accessories required for full installation. Basis of Design: JM TPO Pourable Sealer A & B, JM TPO Membrane Cleaner, JM TPO Membrane Primer (Low VOC), JM TPO Sealing Mastic, JM TPO Cover Tape, JM TPO Detail Membrane, JM TPO Peel & Stick 10" RPS, JM TPO Peel & Stick 6" RTS, JM TPO-Coated Metal, JM TPO Curb Flashing and JM Single Ply Caulk

2.10 PREFABRICATED ACCESSORIES

- A. Two-piece molded TPO (thermoplastic polyolefin) pocket with a rigid vertical wall and preformed flange.
 - 1. Product: **JM TPO Penetration Pans**
- B. A conically stepped pre-molded TPO membrane with a pressure sensitive tape on the flange.
 - 1. Product: **JM TPO Peel & Stick Pipe Boot**
- C. A conically stepped pre-molded TPO membrane.
 - 1. Product: **JM TPO Pipe Boot**
- D. A pre-molded inside corner manufactured with a non-reinforced TPO membrane.
 - 1. Product: **JM TPO inside Corner**
- E. A pre-molded outside corner manufactured with a non-reinforced TPO membrane.
 - 1. Product: **JM TPO outside Corner**

2.11 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. Treated 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 additional 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.**

2.12 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
 - 3. Maximum Panel Size: 4 feet x 4 feet. R value: 5.7 per inch.
 - 4. Tapered Insulation: 1/8 inch per foot slope with 1/4 inch per foot crickets (Existing Buildings)
 - 5. Compressive Strength: 20 psi minimum at any point. ASTM D1621-73.
 - 6. Flame Spread: 25 or less, ASTM E-81-81.
 - 7. Moisture vapor transmission: ASTM C355, less than 1 perm.
 - 8. Water absorption: ASTM C209, less than 1%.

9. Dimensioned stability: ASTM D2126, 2% maximum 24 hours.
 10. Factory Mutual approved and Underwriter's Laboratories listed.
- B. Flat Stock: Base Layer - **Energy 3- 20 psi with a minimum R Value of 30. (Two (2) layers of 2.6 inch in Structurally Sloped areas).**
1. Polyisocyanurate foam, fiberglass facer on both sides, manufactured using Pentane as the blowing agent.
 2. ASTM C-1289-01. Type II, Class I, Grade II
 3. Maximum Panel Size: 4 feet x 4 feet. R value: 5.7 per inch
 4. Compressive Strength: 20 psi minimum at any point, 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.

2.13 INSULATION ACCESSORIES

- A. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and furnished by roofing system manufacturer. Basis of Design: UltraFast Fasteners and Plates
- B. Urethane Adhesive: Manufacturer's two component polyurethane adhesive formulated to adhere insulation to substrate. Basis of Design: **Roofing Systems Urethane Adhesive (RSUA)**

2.14 ROOF COVER BOARDS

- A. Cover Boards

1. Top Layer: **Johns Manville's ProtectoR HD Cover Board**. Product shall conform to the requirements of ASTM C 1289, Type II, Class 4, Grade 1;
 - a. Cover Board: ½-Inch-thick factory laminated to the polyisocyanurate board to the sizes required to meet the minimum R-value.
 - b. High Density closed cell polyisocyanurate foam board with clay-coated fiber glass facer factory attached to the polyisocyanurate at sizes necessary to make two layers of insulation.
 - c. Minimum Compressive strength: Grade 1 - 109 psi (751 kPa).
 - d. Flexural Strength: 675 psi (4654 kPa), ASTM D 1037; 40 lbf (0.18 kN) ASTM 1037
 - e. Dimensional Stability: >0.5%, ASTM 2126
 - f. Moisture Vapor Permeance: <1 perm, 57.5 ng/(Pa•s•m²) ASTM E 96
 - g. R-Value: 2.5 (hr•ft²•°F)/Btu, ASTM C 518
 - h. Water Absorption (max) 1.5%, 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. (5.4 kg)

2.15 FASTENERS

A. Wood Blocking

1. No. 14 screws with fluorocarbon coating that penetrate the nailers 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 nailers below 1 ¼ inch. Set in two rows staggered at 12 inches on center.

2.16 ROOF CURBS

- A. Provide a minimum of one row of wood blocking to top of existing curbs to raise the flashing a minimum of 8 inches.

2.17 EXPANSION JOINTS (Where indicated on drawings)

- A. Provide new expansion joint cover; **JM Expand-O-Flash**, curb to wall and/or curb formed, 4" wide and 4" vertical.

2.18 ROOF DRAINS

- A. **For Existing Construction 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 existing as manufactured by Zurn, or approved equal by Architect.

2.19 EDGE METAL

- A. Coping System: Manufacturer's factory fabricated coping consisting of a base piece and a Snap-On cap. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Product: ***Presto-Lock Coping***
- B. Fascia System: Manufacturer's factory fabricated fascia consisting of a base piece and a Snap-On cover. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Product: ***Presto-Tite Fascia***.

PART 3 - EXECUTION

3.01 REMOVAL

- A. Removal of existing roofing, cover board, insulation, vapor barrier and the existing roofs down to the 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. All surfaces must be clean, smooth, dry, compatible and free of dirt, debris, oil/grease and gravel. Damaged or missing decking material must have new like materials installed so as to meet the requirements of the manufacture's written instructions for application of the new roofing.
- C. Do not apply roofing materials to damp, frozen, dirty, dusty, or deck surfaces unacceptable to the manufacturer.
- D. Remove and Replace all deteriorated or broken decking. Report this to the Owners Representative prior to installing new decking.

3.02 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. Clean the substrate of projections and substances detrimental to the work.
- C. 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 roof deck in accordance with Article 3.05, G, H and I.
 - 2. Wood nailers will be installed at all perimeters to be able to receive the height of the new tapered insulation whether indicated on the drawings or not at no addition cost to the owner.
- D. Coordinate roofing with flashings and other adjoining work to insure proper sequencing of the entire work.

3.03 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.

3.04 WOOD BLOCKING, CANTS AND PLYWOOD

- A. Wood Blocking is required, as indicated in the details and drawings.
- 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 total thickness of insulation and cover boards.
- E. Provide wood blocking to raise existing equipment curbs flashing heights. Maintain 8 inches minimum height above membrane.
- F. Provide treated 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 1/2 inch (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 16 p 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.

3.05 FIRST LAYER OF INSULATION INSTALLATION

- A. Coordinate installation of roof system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Starting at the low edge of the roof, mechanical fasten thermal layer of insulation to the deck.
- C. Install boards with long joints continuous.
 - 1. Install with long joints running parallel to the decking.
- D. Stagger short joints.
- E. Butt joints tightly.
 - 1. "Occasional" joint widths up to 1/8" will be allowed. Fill all any widths greater than 1/8" with scrap thermal layer to achieve consistent surface.
- F. Install only that amount that can be completed in one day or when rain is imminent.
- G. Preliminarily Fastened Insulation: Install insulation with fasteners at rate required by roofing system manufacturer or applicable authority, whichever is more stringent.
 - 1. Fasten first layer to resist uplift pressure at corners, perimeter, and field of roof but not less then:
 - a. Field: 8 fasteners per 4'x 4' board
 - b. Perimeter: 12 fasteners per 4'x4' board
 - c. Corners: 16 fasteners per 4'x4' board

3.06 INSULATION AND COMPOSITE COVER BOARD INSTALLATION

- A. Adhered Insulation: Install each layer of maximum 4'x4' insulation and composite cover board and adhere to substrate as follows:
- B. Starting at the low edge of the roof, install thermal layer and thermal protective layer in specified urethane adhesive.

- C. Install boards with long joints continuous.
- D. Stagger all joints from the board below.
- E. Butt joints tightly.
- F. "Occasional" joint widths up to 1/8" will be allowed. Fill all any widths greater than 1/8" with scrap thermal layer to achieve consistent surface.
- G. Set thermal layer in a serpentine fashion using 2-part urethane insulation adhesive applied in 3/4-inch-wide beads at the following minimum rates:
 - 1. Field: Beads at **4** inches on center
 - 2. Perimeter: Beads at **4** inches on center
 - 3. Corner: Beads at **4** inches on center
- H. Place board into the adhesive while it is still tacky.
 - 1. If adhesive reaches its tack-free state, remove and re-apply adhesive.
- I. Press the thermal layer into the adhesive to a firm and uniform bearing.
 - 1. Use ballast (sandbags or bagged rocks) on all four corners of the board for a minimum of 30 minutes to ensure contact of material and adhesive, if necessary.
- J. Keep insulation absolutely dry at all times. Discard insulation that contains moisture.
- K. Install only as much insulation as can be covered with roofing membrane the same day.
- L. Repair any defects or installation errors prior to next phase of roof system installation.

3.07 ADHERED ROOFING MEMBRANE INSTALLATION

- A. Install Johns Manville roofing membrane specification **ST6A S-P** in the areas over the composite board. Install roofing according to membrane roofing system manufacturer's written instructions or these specifications whichever are more stringent. Unroll roofing membrane and allow to-relax before installing.
- B. Start installation of roofing membrane in the presence of membrane roofing system manufacturer's technical personnel.
- C. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

- D. Once the membrane has been properly positioned, fold the sheet back half of the sheet's length
- E. Bonding Adhesive: Apply solvent-based sprayable bonding adhesive to substrate and underside of roofing membrane at rate required by manufacturer and allow to partially dry before installing roofing membrane. Do not apply bonding adhesive to splice area of roofing membrane.
- F. Mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.
- G. Apply a heavy smooth surface roller over the entire roof as soon as the membrane is set in place.
- H. Apply roofing membrane with side laps shingled with slope of roof deck where possible.
- I. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity.
 - 2. Apply lap sealant to seal cut edges of roofing membrane.
 - 3. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
 - a. Remove and repair any unsatisfactory sections before proceeding with Work.
 - 4. Repair tears, voids, and lapped seams in roofing membrane that do not meet requirements.
- J. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

3.08 MEMBRANE FLASHING

- A. General: TPO membrane shall be used for flashing of all straight walls, large curbs, and all large, straight sided penetrations. TPO Flashing or TPO Peel & Stick Flashing shall be used for flashing of all pourable sealer penetration pockets, vent pipes, scuppers, curbs, T-Joints, inside/outside corners of wall flashings, etc.
- B. All pipe penetrations are to be flashed with TPO Flashing, TPO peel & Stick Flashing or TPO Pre-Molded Pipe Boots. Refer to all applicable TPO Detail Drawings.
- C. Straight run wall and curb flashing shall be flashed with TPO.
Note: All flashings are to extend a minimum height of 8" (200 mm) above the roof level.
- D. 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.

- E. Terminations utilizing aluminum compression bars or surface-mounted counter flashings must be secured directly to a smooth and sealed wall surface.
- F. TPO wall flashings terminated with metal copings must be fully extended under the coping and mechanically fastened a minimum 1-1/2" (40 mm) down the face of the wall.
- G. TPO Flashing Membrane shall be adhered to the substrate using TPO Bonding Cement. Follow the TPO 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.

3.09 INSTALLATION OF ROOF EDGING SYSTEMS

- A. Verify that the roof edging installation will not disrupt other trades.
- B. Verify that the substrate is dry, clean and free of foreign matter.
- C. Report and correct defects prior to any installation.
- D. Submit product design drawings for review and approval to Architect or Specifier before fabrication.
- E. Check as-built conditions and verify the manufacturer's roof edge details for accuracy to fit the wall assembly prior to fabrication.
- F. Comply with the roof edging manufacturer's installation guide when setting edging.
- G. Use provided fasteners consistent with manufacturer's instructions, suitable for the substrate to which it is being installed.
- H. Install water cut-off, as recommended by the membrane manufacturer, under the anchor bar.
- I. Roof Edge Flashing Strips
 - 1. Install flashing strips in longest lengths possible to minimize laps under anchor bar
- J. Follow manufacturer's application method for installing flashing strips.
 - 1. Minimum 8 inches into the field of the roof.
 - 2. Down outside face of the wall, 1/2-inch past wood nailers.
 - 3. Miter and Scupper Bar.

K. Splice Plates

1. Apply 3/8-inch bead of non-curing sealant to both sides of spacer and on deck flange.

L. Anchor Bars

1. Remove all dirt, dust and debris from anchor bar.
2. Apply a 3/8-inch-wide and 1/4-inch-thick band of mastic to the back of the anchor bar.
3. Position 12-foot sections of anchor bar with applied mastic overlapping splice plate and butting securely to EPDM gasket.
4. Allow 1/2-inch space between anchor bars.
5. Install splice plate at opposite end of 12-foot anchor bar.
6. Fasten anchor bar at 12 inches on center intervals throughout.
7. Use 2" stainless steel fasteners provided by manufacturer.
8. Field cut sections as necessary.

M. Fascia Panels

1. Install panels left to right.
2. Position 12' fascia panels on top of anchor bar.
3. Overlap preceding panel by 1 inch at notches provided.
4. With panels in correct position snap each section into anchor panel.

3.10 FLASHING

- A. Follow same procedures as described for cleaning, adhesive application, and lap sealant application.
- B. 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.
- C. At vertical surfaces apply TPO flashing over polyester reinforced termination strip.
- D. 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.

- E. Remove roof top power ventilators, extend top of curb to minimum 12 inches above roof line. Extend flashing over top of curb. Reset equipment.
- F. Provide termination strip and continuous bead of sealant under counter flashing.
- G. Straight run wall and curb flashings shall be flashed with TPO membrane. **Note: All flashings are to extend a minimum height of 8" (200mm) above the roof level.**
- H. 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.
- I. Terminations utilizing aluminum compression bars are surface-mounted counter-flashings must be secured directly to a smooth and sealed wall surface.
- J. TPO wall flashings terminated with metal copings must be fully extended under the coping and mechanically fastened to the face of the outside wall covering all wood blocking a minimum 1 ½" past where wood terminates (40mm).
- K. TPO Flashing Membrane shall be adhered to substrate using TPO bonding cement. Follow the TPO 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.

3.11 WALKWAY PADS

- A. Provide manufacturer's standard TPO walkway pads at each roof ladder (Top and Bottom), at each roof hatch and completely around each HVAC unit and any other areas designated on the drawings. Install in accordance with manufacturers requirements with lap cement or seam tape.

3.12 EXPANSION JOINT

- A. Install a new expansion joint cover, curb to wall, curbed formed as per the manufacturers' specifications.

3.13 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 TPO 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 TPO Primer/Wash or other approved cleaning method. Apply a 1/4-inch (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, or if the substrate surface is rough, apply two 1/4-inch (8mm) beads of sealant.

- B. 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.

3.14 INSPECTIONS

- A. All work shall 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.

3.15 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.
- C. Repair or replace defaced or disfigured finishes caused by work of this section.

3.16 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.
- D. Provide reinforced polyethylene membrane over the finished roof area and held in place with a removable double-sided tape installed at the completion of each day.
 - 1. Provide tape in such a manner that the wind will not blow the 6-mil poly off the completed roof area. Area of complete roofing must be kept clean at all times.

3.17 FIELD CONTROL

- A. Field inspection will be performed as outlined under 1.08B of this section.

3.18 ROOF DRAINS

A. Existing Roofs:

1. The Contractor shall remove the existing Roof Drain Dome Strainers and Flashing Clamp Rings, Roof flashings and discard.
2. Clean and prep remaining drain bowl assembly for new roofing.
3. Drill and tap broken drain bolts and replace if necessary.
4. Repair or replace broken drain components.
5. 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

B. 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.

C. Install TPO 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 roof drain locations.**

D. Install clamping ring and drain covers supplied with drain.

E. Test all drains for proper flow and water-tightness. Correct any and all defects.

3.19 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 nailers and pourable sealer for all angles and unusual penetrations.

3.20 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.

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 3/4" 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 3/4" 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 3/4-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 $\frac{1}{4}$ "/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 $\frac{1}{2}$ " 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 $\frac{3}{8}$ " 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 07830 - ROOF SCUTTLE

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Furnish and install a metal roof scuttle where indicated on the drawings and as specified herein.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Roof scuttle shall be as manufactured by the "Bilco Company", Type "E-20" 3'-0" x 3'-0" or an equal approved in advance by the Architect.
- B. Cover shall be 11 gauge galvanized steel with 3" beaded flange, neatly welded.
- C. Insulation shall be glass fiber 1" thickness, fully covered and protected by a 18 gauge galvanized steel metal liner.
- D. Curb shall be 12" in height and of 14 gauge galvanized steel. Curb shall be formed with a 3 1/2" flange with holes provided for securing to the roof deck. Curb shall be equipped with an integral metal cap flashing of 14 gauge galvanized steel, fully welded at the corners for weathertightness.
- E. Scuttle shall be completely assembled with heavy pintle hinges, compression spring operations enclosed in telescopic tubes, positive snap latch with turn handles and padlock hasps inside and outside, and neoprene draft seal. Cover shall be equipped with an automatic hold-open arm complete with 1" diameter red vinyl grip handle to permit easy, one-hand release.
- F. All hardware shall be cadmium plated.
 - 1. Cover hardware shall be bolted into heavy gauge channel over supports welded to underside of cover and concealed within the insulation space.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Contractor shall field check dimensions and conditions to assure proper installation. Report any conditions which would interfere with proper execution of this work. Do not proceed until all unsatisfactory conditions are corrected.

3.02 GUARANTEE

- A. Contractor shall furnish to the Owner a Five Year (5 year) written guarantee from the manufacturer against defects in material or workmanship.

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. Dow 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 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*sq ft 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 than $\frac{1}{4}$ 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

SECTION 08670
SKYLIGHT PROTECTION SCREEN

PART 1-GENERAL

1.1 SUMMARY

- A. This section includes the following:
 - Basis of design:
 - 1. Skylight Protection and Screens model CAEW

1.2 PERFORMANCE REQUIREMENTS

- A. General: Screen is tested to 200 lb. static load.

1.3 SUBMITTALS

- A. Product Data Sheet: Include details of construction and installation, relative to applicable skylight frame.

1.4 WARRANTY

- A. General: Warranties specified in this section 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: Provide written warranty signed by manufacturer, agreeing to repair or replace work that exhibits defects in materials or workmanship as defined by the manufacturer.
 - 1. Warranty Period: 2 years from date of Substantial Completion.

PART 2- PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by Wasco Skylights part of the Velux Group, Commercial Division, Wells, ME (800-388-0293).
- B. Or architect approved equal
 - 1. List of similar projects successfully completed within the last five years.
 - 2. Proof of financial capability.
 - 3. Complete details of proposed skylight.
 - 4. Complete specifications for Architect's review.

2.2 MATERIALS

- A. Screen: Welded steel wire mesh, 4" x 4" spacing, wire diameter - .188" min. hot dipped galvanized finish on carbon steel.

- B. Frame: Extruded aluminum alloy 6063-T5 (min). ASTM B 221 (ASTM B 221 M) with minimum effective thickness of 0.090 inch (2.2 mm).
 - 1. Frame includes a pocket for the edges of the screen material, and a downward leg for attachment to any vertical surface of a skylight retainer or frame.
- C. Adjustment Bar: Extruded aluminum bar stock, ¼" x 1", alloy 6063-T5 (min). ASTM B 221 (ASTM B 221 M).
 - 1. Adjustment bar is slotted for width adjustment in the field.
- D. Fasteners: Nonmagnetic stainless steel or other non-corrosive metal as recommended by manufacturer.

2.3 FABRICATION

- A. Fabricate frame components to factory specifications.
- B. Assemble frame legs (2 sides) and adjustment bar (2 sides) into a frame using ¼-14 x 1" hex hd. stainless steel fasteners.
- C. Install screen in frame and fix into frame with 1/4-14 x 1" hex hd. stainless steel fasteners.

PART 3- EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with installer present, for compliance with requirements for installation tolerances and other conditions affecting screen performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Metal Protection: As follows:
 - 1. 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.

3.3 INSTALLATION

- A. General: Comply with manufacturer's written instructions for protecting, handling and installing fall protection components.

END OF SECTION

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware
2. Field verification, preparation and modification of existing doors and frames to receive new door hardware.

B. Section excludes:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:

1. Division 01 Section "Alternates" for alternates affecting this section.
2. Division 06 Section "Rough Carpentry"
3. Division 06 Section "Finish Carpentry"
4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
5. Division 08 Sections:
 - a. "Metal Doors and Frames"
 - b. "Flush Wood Doors"
6. Division 09 sections for touchup, finishing or refinishing of existing openings modified by this section.

1.02 REFERENCES

A. UL - Underwriters Laboratories

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 70 – National Electric Code
2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.03 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
 - a. Comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, "EXAMINATION" article, herein.
 - b. Review drawings and Sections from related trades to verify compatibility with specified hardware.
 - c. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:

1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.
 - a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
3. Door Hardware Schedule:
 - a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
 - b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
 - c. Indicate complete designations of each item required for each opening, include:

- 1) Door Index: door number, heading number, and Architect's hardware set number.
- 2) Quantity, type, style, function, size, and finish of each hardware item.
- 3) Name and manufacturer of each item.
- 4) Fastenings and other pertinent information.
- 5) Location of each hardware set cross-referenced to indications on Drawings.
- 6) Explanation of all abbreviations, symbols, and codes contained in schedule.
- 7) Mounting locations for hardware.
- 8) Door and frame sizes and materials.
- 9) Degree of door swing and handing.
- 10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.

4. Key Schedule:

- a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
- b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
- c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
- d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
- e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
- f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

C. Informational Submittals:

1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:
 - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
 - b. Include warranties for specified door hardware.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
 - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Final approved hardware schedule edited to reflect conditions as installed.
 - d. Final keying schedule
 - e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

E. Inspection and Testing:

1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
 - a. fire door assemblies, in compliance with NFPA 80.
 - b. required egress door assemblies, in compliance with NFPA 101.

1.04 QUALITY ASSURANCE

A. Qualifications and Responsibilities:

1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
 - a. For door hardware: DHI certified AHC or DHC.
 - b. Can provide installation and technical data to Architect and other related subcontractors.
 - c. Can inspect and verify components are in working order upon completion of installation.
 - d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.
4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:

1. Fire-Rated Door Openings:
 - a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
 - b. Provide only items of door hardware that are listed products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
2. Smoke and Draft Control Door Assemblies:
 - a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
 - b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.

3. Accessibility Requirements:

- a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.

C. Pre-Installation Meetings

1. Keying Conference

- a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
 - 1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - 2) Preliminary key system schematic diagram.
 - 3) Requirements for key control system.
 - 4) Requirements for access control.
 - 5) Address for delivery of keys.

2. Pre-installation Conference

- a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- b. Inspect and discuss preparatory work performed by other trades.
- c. Inspect and discuss electrical roughing-in for electrified door hardware.
- d. Review sequence of operation for each type of electrified door hardware.
- e. Review required testing, inspecting, and certifying procedures.
- f. Review questions or concerns related to proper installation and adjustment of door hardware.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.
- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.
- C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
- D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

1.06 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- E. Existing Openings: Where existing doors, frames and/or hardware are to remain, field verify existing functions, conditions and preparations and coordinate to suit opening conditions and to provide proper door operation.

1.07 WARRANTY

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.
 - 1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
 - 2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
 - a. Mechanical Warranty
 - 1) Locks
 - a) Schlage L Series: 3 years
 - 2) Closers
 - a) LCN 4000 Series: 30 years
 - b. Electrical Warranty
 - 1) Closers
 - a) LCN: 2 years

1.08 MAINTENANCE

- A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
- B. Turn over unused materials to Owner for maintenance purposes.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."
- B. Approval of manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.

- C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
- D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

A. Fabrication

- 1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer's recognized installation standards for application intended.
- 2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
- 3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with "Metal Doors and Frames", "Flush Wood Doors", "Stile and Rail Wood Doors" to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.

B. Modification and Preparation of Existing Doors: Where existing door hardware is indicated to be removed and reinstalled.

- 1. Provide necessary fillers, Dutchmen, reinforcements, and fasteners, compatible with existing materials, as required for mounting new opening hardware and to cover existing door and frame preparations.
- 2. Use materials which match materials of adjacent modified areas.
- 3. When modifying existing fire-rated openings, provide materials permitted by NFPA 80 as required to maintain fire-rating.

C. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

- 1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

2.03 CONTINUOUS HINGES

A. Manufacturers:

- 1. Scheduled Manufacturer:
 - a. Ives
- 2. Acceptable Manufacturers:
 - a. Select
 - b. Roton
 - c. ABH

B. Requirements:

1. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
2. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
3. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
4. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
5. On fire-rated doors, provide aluminum geared continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
6. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.04 MORTISE LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Schlage L9000 series
2. Acceptable Manufacturers and Products:
 - a. Sargent 8200 series
 - b. Best 45H series

B. Requirements:

1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3-hour fire doors.
2. Indicators: Where specified, provide indicator window measuring a minimum 2-inch x 1/2 inch with 180-degree visibility. Provide messages color-coded with full text and/or symbols, as scheduled, for easy visibility.
3. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
4. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
5. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1-inch (25 mm) throw, constructed of stainless steel.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide switches and sensors integrated into the locks and latches.
7. Provide motor based electrified locksets that comply with the following requirements:
 - a. Universal input voltage – single chassis accepts 12 or 24VDC to allow for changes in the field without changing lock chassis.
 - b. Fail Safe/Fail Secure – changing mode between electrically locked (fail safe) and electrically unlocked (fail secure) is field selectable without opening the lock case.
 - c. Low maximum current draw – maximum 0.4 amps to allow for multiple locks on a single power supply.

- d. Low holding current – maximum 0.01 amps to produce minimal heat, eliminate “hot levers” in electrically locked applications, and to provide reliable operation in wood doors that provide minimal ventilation and air flow.
 - e. Connections – provide quick-connect Molex system standard.
8. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
- a. Vandlguard: Provide levers with vandal resistant technology for use at heavy traffic or abusive applications.
 - b. Lever Design: 06A

2.05 CYLINDERS

A. Manufacturers and Products:

- 1. Scheduled Manufacturer and Product:
 - a. Best
- 2. Acceptable Manufacturers and Products:
 - a. No Substitute

B. Requirements:

- 1. Provide cylinders/cores, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer’s series as indicated. Refer to “KEYING” article, herein.
- 2. Nickel silver bottom pins.

2.06 KEYING

A. Scheduled System:

- 1. Existing factory registered system:
 - a. Provide cylinders/cores keyed into Owner’s existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

2.07 DOOR CLOSERS

A. Manufacturers and Products:

- 1. Scheduled Manufacturer and Product:
 - a. LCN 4010/4110/4020 series
- 2. Acceptable Manufacturers and Products:

- a. Corbin-Russwin DC8000 series
- b. Sargent 281 series

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. Certify surface mounted mechanical closers to meet fifteen million (15,000,000) full load cycles. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2-inch (38 mm) diameter with 11/16-inch (17 mm) diameter double heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers. When closers are parallel arm mounted, provide closers which mount within 6-inch (152 mm) top rail without use of mounting plate so that closer is not visible through vision panel from pull side.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI/BHMA Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.08 ELECTRO-MECHANICAL CLOSER/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. LCN
2. Acceptable Manufacturers:
 - a. Norton
 - b. Rixson

B. Requirements:

1. Provide single-point or multi-point hold-open electro-mechanical closer/holders as specified. Coordinate voltage requirements and provide transformer if necessary.
2. Provide closer/holders that function as full rack and pinion door closer when current is interrupted or continuous hold-open is not engaged.
3. Provide door closers with fully hydraulic, full rack and pinion action with high strength cylinder and full complement bearings at shaft.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.

5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.09 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. Burns
 - b. Trimco

B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Size plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

2.10 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. Trimco
 - b. Burns

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.
2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

2.11 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Zero International
2. Acceptable Manufacturers:
 - a. National Guard
 - b. Reese

B. Requirements:

1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

2.12 MAGNETIC HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. LCN
2. Acceptable Manufacturers:
 - a. Rixson
 - b. Sargent

B. Requirements:

1. Provide wall or floor mounted electromagnetic door release as specified with minimum of 25 pounds of holding force. Coordinate projection of holder and armature with other hardware and wall conditions to ensure that door sits parallel to wall when fully open. Connect magnetic holders on fire-rated doors into the fire control panel for fail-safe operation.

2.13 FINISHES

A. FINISH: BHMA 626/652 (US26D); EXCEPT:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Aluminum Geared Continuous Hinges: BHMA 628 (US28)

3. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
4. Protection Plates: BHMA 630 (US32D)
5. Overhead Stops and Holders: BHMA 630 (US32D)
6. Door Closers: Powder Coat to Match
7. Wall Stops: BHMA 630 (US32D)
8. Latch Protectors: BHMA 630 (US32D)
9. Weatherstripping: Clear Anodized Aluminum
10. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.
- B. Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.
- C. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- D. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 2. Custom Steel Doors and Frames: HMMA 831.
 3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
 4. Installation Guide for Doors and Hardware: DHI TDH-007-20
- B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.
- C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.
- I. Lock Cylinders:

1. Install construction cores to secure building and areas during construction period.
- J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:
1. Conduit, junction boxes and wire pulls.
 2. Connections to fire/smoke alarm system and smoke evacuation system.
 3. Connections to panel interface modules, controllers, and gateways.
 4. Testing and labeling wires with Architect's opening number.
- K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- L. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
- M. Closer/Holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- N. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
- O. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

3.03 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.04 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items per manufacturer's instructions to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.05 DOOR HARDWARE SCHEDULE







- A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

- B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.
- C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.
- D. Hardware Sets:

66177 OPT0245032 Version 1







HARDWARE SET NO. 01 - SINGLE CLASSROOM SECURITY

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	224XY		628	IVE
1	EA	CLASSROOM SECURITY	L9071L 06A L283-711		626	SCH
2	EA	MORTISE CYLINDER	BEST - TO MATCH EXISTING SYSTEM		626	BES
1	EA	SURFACE CLOSER	4111 EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CVX		630	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER


HARDWARE SET NO. 02 - SINGLE STOREROOM

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	224XY		628	IVE
1	EA	STOREROOM LOCK	L9080L 06A		626	SCH
1	EA	MORTISE CYLINDER	BEST - TO MATCH EXISTING SYSTEM		626	BES
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CVX		630	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER

HARDWARE SET NO. 03 - SINGLE EXISTING DOOR & FRAME - NEW MAGNETIC HOLD OPEN - WALL MOUNTED


Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	MAGNET	SEM7830 12V/24V/120V		689	LCN

* PROVIDE LCN SEM7810-514 COUPLER ASSEMBLY AND SEM7810-EXXX EXTENSIONS AS REQUIRED FOR DOOR TO RELIABLY REACH MAGNET

HARDWARE SET NO. 04 - PAIR EXISTING DOORS AND FRAME - MAGNETIC HOLD OPEN - WALL MOUNTED



Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	MAGNET	SEM7830 12V/24V/120V		689	LCN

* PROVIDE LCN SEM7810-514 COUPLER ASSEMBLY AND SEM7810-EXXX EXTENSIONS AS REQUIRED FOR DOOR TO RELIABLY REACH MAGNET

HARDWARE SET NO. 05 - PAIR EXISTING DOORS AND FRAME - MAGNETIC HOLD OPEN - WALL MOUNTED X FLOOR MOUNTED




Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	MAGNET	SEM7820 12V/24V/120V		689	LCN
1	EA	MAGNET	SEM7830 12V/24V/120V		689	LCN

* PROVIDE LCN SEM7810-514 COUPLER ASSEMBLY AND SEM7810-EXXX EXTENSIONS AS REQUIRED FOR DOOR TO RELIABLY REACH MAGNET

HARDWARE SET NO. 06 - PAIR EXISTING DOORS AND FRAME - MAGNETIC HOLD OPEN - WALL MOUNTED X 4040SEH

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	FIRE/LIFE HOLDER	4040SEH 24V/120V AC/DC AS REQ		689	LCN
1	EA	SURFACE CLOSER	4111 CUSH		689	LCN
1	EA	MAGNET	SEM7830 12V/24V/120V		689	LCN

* PROVIDE LCN SEM7810-514 COUPLER ASSEMBLY AND SEM7810-EXXX EXTENSIONS AS REQUIRED FOR DOOR TO RELIABLY REACH MAGNET

* SEH HOLDER AND CUSH CLOSER MUST BE TEMPLATED TO THE SAME DEGREE OF OPENING TO PROTECT THE HOLD OPEN UNIT FROM OPENING BEYOND ITS LIMITS. FAILURE TO DO SO WILL CAUSE DAMAGE TO THE SEH HOLDER AND IT MUST THEN BE REPLACED BY THE GC WITH NO ADDITIONAL COST TO THE OWNER

Door Numbers	HwSet#
1A	03
1B	03
1C	04
100A	01
101	01
101A	01
102	01
103A	01
104A	01
120A	04
121A	04
121B	04
134A	01
154A	03
154B	03
168A	03
168B	03
168C	03
168D	03
209	01
210	01
229A	01
229B	01
229C	02
303	01
304	01
C3	04
C4	05
J100	06
J101	06
J102	05
J103	04
K100	06
K101	06
K104	06
K105	06
L1	04
M1	04

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. Gypsum wallboard.
 - 2. All trim, battens, corners, and similar items.
 - 3. All required fastenings, framing, and attachments.
 - 4. All adhesive, tapes, and joint compound systems as required.
 - 5. Wall to wall corner expansion joint.

1.02 RELATED WORK

- A. Related work specified under other sections of the specifications:
 - 1. Section 09510 - Acoustic Ceiling Systems.
 - 2. Section 09900 - Painting.

1.03 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-1396
 - 2. Joint treatment: ASTM C-475/C475M.
 - 3. Non-load bearing steel studs, runners, and rigid furring channels for screw attachment of gypsum wallboard: ASTM C-645.

1.04 SUBMITTALS

A. 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.

1.05 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.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Gypsum Wallboard Types:

1. Regular gypsum board and Type X gypsum board: Thickness as shown on the drawings, with long edges tapered on the face side, conforming to ASTM C-1396 and manufactured by U.S. Gypsum, National Gypsum, Georgia Pacific, or approved equal.
2. Hi-Impact 2000 Wallboard (Regular and Type X): Thickness shall be 5/8" th. Gypsum core is encased in heavy natural-finish paper of 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 are tapered to allow joints to be reinforced and concealed, conforming to ASTM C-1396 and Fed. Spec. SS-L-30D and manufactured by National Gypsum Co., or approved equal by the Architect.

B. Adhesive: USG Durabond 90.

C. Metal trim: All 25 gauge, manufactured by U.S. Gypsum under the following numbers or approved equal:

1. Corner beads: No. 25 gauge "Dura-Bead".
2. Casings: No. 400.

3. Control joints: No. 093.
- D. Studs and stud tracks: Standard 20 gauge non-load bearing channel shape, formed from galvanized steel, with widths as required and as manufactured by National Gypsum, U.S. Gypsum, or approved equal.
- E. Galvanized 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.
- F. Tape and joint compound: Manufactured by the approved manufacturer of the gypsum board.
- G. Screws and other fastenings: Of a type recommended by the manufacturer for the particular purpose intended.
- H. Wall to wall (corner) expansion joint: Wabo ECC-200 corner coverplate, aluminum alloy 6063-TS or 6061-T6, mill finish. Paint as per Section 09900.

PART 3- EXECUTION

3.01 ERECTION OF METAL STUDS

- A. 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 stud nails or power-driven anchors, to suspended ceilings with toggle bolts, or to slab above where indicated.
- B. Position studs vertically in runners, spaced 16 inches on center maximum.

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.

When necessary, studs shall be spliced by nesting 2 studs with a minimum lap of 8 inches, attaching flanges with 2 screws per flange.

- C. Provide horizontal bracing of studs at mid-point in partition height. Bracing shall be standard metal stud cut to fit and secured to studs.
- D. 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.
- E. 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.

3.02 WALLBOARD INSTALLATION

- A. Unless otherwise specified, methods of installation shall be in accordance with the requirements of the Gypsum Association and the approved manufacturer.
- 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.
- E. Support end joints on studs. Apply end joint compound to the back of the board along end joints.
- F. No end joints shall align with edges of openings. Install expansion and/or control joints where shown or required.
- G. Install metal trim at corners, edges, and elsewhere as shown in accordance with the manufacturer's instructions and recommendations.
- H. 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.
- I. 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.
- J. 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.

- K. 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.
- L. 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.
- M. 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.

3.03 JOINT TREATMENT

- 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.

3.04 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.

3.05 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 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 for 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 not 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 grease 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, <u>or</u> 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 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. AWS 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 manner 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 15018 - MOTORS AND ELECTRICAL WORK

1. Internal electrical control devices that operate starters, controllers, etc. shall be furnished, installed, and wired under Division 15. Such devices shall be included but not necessarily limited to, devices connected to ducts, damper switches, float switches, electric thermostats, safety devices, limit switches, relays, push button controllers, selector switches, pilot lights, extra interlock contacts, etc.
2. Equipment starters and disconnects shall be provided by the mechanical contractor completely mounted and wired to internal controls and shall be wired to incoming and outgoing control connections. Should integral equipment starters, disconnects or control panels be shipped separately, the mechanical contractor shall be responsible for the proper installation and connections from equipment to same. Incoming and outgoing (line and load) power wiring to starters / disconnect switches shall be performed by the electrical contractor.
3. The integration of the existing temperature control system wiring and controls shall be the responsibility of the Contractor under Division 15. The Contractor shall be fully responsible for the satisfactory operation of new equipment with the temperature control system.
4. All control transformers, control devices, starters, and control wiring furnished shall be properly protected with fuse cutouts and fuses or circuit breakers to conform to the National Electric Code, latest edition. All work shall be performed by a licensed electrician.
5. Each piece of equipment shall be provided with permanent type laminated, black finish, white core, phenolic nameplate. Nameplates should indicate the name and number of the unit, voltage, and any interlock reference. Each starter furnished by the Contractor shall be provided with a permanent type laminated, black finish, white core phenolic nameplate. Nameplate shall indicate the name of the unit controlled and the voltage rating. Nameplate shall be secured with adhesives. Plastic tape type labels will not be accepted.
6. All equipment shall be provided with disconnect means (by Mechanical Contractor).
7. All wiring furnished and installed by the mechanical contractor shall be in strict accordance with the latest edition of the National Electrical Code and all State and Municipal Agencies having jurisdiction. Except as specified otherwise, minimum size wire shall be #14 AWG (control) and #12 AWG (power) and shall be run in rigid galvanized steel conduit except as noted hereinafter. All wire shall be Type THHN or as required by code. All conduit connections to motors shall be made with short lengths of neoprene jacketed galvanized flexible metallic conduit (liquitite).
8. 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.

9. 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 control wiring for the new equipment and controls.
 - b. Contractor shall apply final finish to insure uniformity.
 - c. All cutting, patching, and painting as required.
 - d. All controls for units as hereinbefore specified and disconnect switches.
 - e. Testing of all mechanical contractor installed wiring as directed.
 - f. Contractor shall perform all work as stated on the documents for fire alarm fan shutdown for all new applicable equipment, unless noted otherwise.
 - g. Contractor shall obtain an approved independent electrical inspection certificate, covering all work performed by an electrical inspection agency serving the locality of the project.

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 procedure 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. Alloy 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. BAgl: 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)

<u>PIPE SIZE</u>	<u>ROD DIAMETER</u>
2" and smaller	3/8"
2-1/2" thru 3-1/2"	1/2"
4" thru 5"	5/8"
6" and over	3/4"

<u>TYPE</u>	<u>MAXIMUM SPACING</u>
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 of 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 Thermometers:
1. General - Provide dial bimetal type adjustable angle thermometers of materials, capacities and ranges indicated, designed and constructed for use in service indicated.
 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 high 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 15215 - VIBRATION ISOLATION

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 specified in this section.
- B. This section is a Division 15 Basic Materials and Methods section, and is a part of each Division 15 section making reference to vibration isolation products specified herein. Vibration isolation devices shall conform to the seismic requirements of section 1613 of the New York State Building Code. Isolators shall allow the amount of movement required by this code and shall be equipped with limit stops as required by this code.

1.02 DESCRIPTION OF WORK

- A. Extent of vibration isolation work required by this section is indicated on drawings and schedules, and/or specified in other Division 15 sections.
- B. Types of vibration isolation products specified in this section include the following:
 - 1. Fiberglass Pad and Shapes
 - 2. Neoprene Pads
 - 3. Cork/Neoprene Pads
 - 4. Equipment Rails
 - 5. Fabricated Equipment Bases
 - 6. Roof Curb Isolators
 - 7. Isolation Hangers
 - 8. Riser Isolators
 - 9. Riser Support Isolators
 - 10. Flexible Duct Connectors
 - 11. Flexible Pipe Connectors
- C. Vibration isolation products furnished as part of factory-fabricated equipment, are specified as part of the equipment assembly in other Division 15 sections.
- D. Refer to other sections of these specifications for equipment foundations, hangers, sealants, gaskets and other work related to vibration isolation work.

1.03 QUALITY ASSURANCE

- A. Product qualification - provide each type of vibration isolation unit produced by specialized manufacturer, with not less than 5 years successful experience in production of units similar to those required for project.
 - 1. Except as otherwise indicated, obtain support isolation

1.04 SUBMITTALS

- A. Product data - submit manufacturer's specifications, detailed drawings, performance characteristics data and installation instructions for each type of unit required.
 - 1. Include data for each type and size of unit, showing isolation efficiency, stiffness, natural frequency and transmissibility at lowest operating speed of equipment.
 - 2. Where required, include independent test agencies certified report of test results for each type of unit.
 - 3. For spring units, show wire size, spring diameter, free height, solid-compression height, operating height, fatigue characteristics and ratio of horizontal to vertical stiffness.
 - 4. For spring and pad type units, show basis of spring rate selection for range of loading weights.
 - 5. Include performance certifications where required.
- B. Shop drawings - submit shop drawings showing structural design and details of inertia bases, steel beam bases and other custom fabricated work not covered by manufacturer's submitted data.
 - 1. Furnish templates to fabricators of equipment bases, foundations and other support systems, as needed for coordination of vibration isolation units with other work.
- C. Submit shop drawings indicating scope of vibration isolation work and locations of units and flexible connections. Include support isolation points for piping and ductwork including risers, air housings and inertia bases.
 - 1. Include schedule of units, showing size or manufacturer's part number, and weight supported and resulting deflection of each unit.

PART 2 - PRODUCTS

2.01 ISOLATION MATERIALS AND SUPPORT UNITS

- A. Fiberglass pads and shapes - glass fiber of not more than 0.18 mil diameter, produced by multiple-flame attenuation process, molded with manufacturer's standard fillers and binders through 10 compression cycles at 3 times rated load bearing capacity, to achieve natural frequency of not more than 12 Hertz, in thicknesses and shapes required for use in vibration isolation units.
- B. Neoprene pads - oil resistant neoprene sheets, of manufacturer's standard hardness and cross ribbed pattern, designed for neoprene in shear type vibration isolation, and in thicknesses required.
- C. Cork/Neoprene pads - close grained composition cork sheet, laminated between 2 sheets of ribbed oil resistant neoprene, in thicknesses required.
- D. Vibration isolation products furnished as part of factory-fabricated equipment, are specified as part of the equipment assembly in other Division 15 sections.
- E. Refer to other sections of these specifications for equipment foundations, hangers, sealants, gaskets and other work related to vibration isolation work.

- F. Equipment rails - where rails or beams are indicated for use with isolator units to support equipment, provide steel beams complying with ANSI/ASTM A36, with minimum depth of 6" or $0.08 \times$ span of beam between isolators (whichever is greater). Provide welded bracket at each end of beams, and anchor each end to spring isolator unit. Provide bolt holes in beams matching anchor bolt holes in equipment. Provide beams of section modulus indicated or, if not indicated, selected for normal-weight equipment loading to limit static load stress to 16,000 psi.
1. Except as otherwise indicated, position equipment on equipment rails so that load will be equally supported by isolator units.
- G. Fabricated equipment bases - where supplementary bases are indicated for use with isolator units to support equipment (base not integral with equipment), provide welded unit, fabricated of structural steel shapes, plates and bars complying with ANSI/ASTM A36, as shown. Provide welded support brackets at points indicated, and anchor base to spring isolator units. Except as otherwise indicated, arrange brackets to result in the lowest possible mounting height for equipment. Provide bolt holes in base matching anchor bolt holes in equipment.
1. Where indicated, provide auxiliary steel base for support of motor, mounted on equipment base with slotted anchor bolt holes for adjustment of motor position.
 2. Where sizes of base framing members are not indicated, fabricate base with depth of structure not less than $0.10 \times$ longest span of base, rigidly braced to support equipment without deflections or distortions which would be detrimental to equipment or equipment performances.
- G. Roof-curb isolators - fabricated frame units sized to match roof curbs as shown, formed with isolation springs between extruded aluminum upper and lower sections, which are shaped and positioned to prevent metal-to-metal contact. Provide continuous airtight and waterproof seal between upper and lower extrusions. Include provisions for anchorage of frame unit to roof curb, and for anchorage of equipment to unit.
- H. Isolation hangers - hanger units formed with brackets and including manufacturer's standard compression isolators of type indicated. Design brackets for 5 times rated loading of units. Fabricate units to accept misalignment of suspension members, and for use with either rod or strap type members and including acoustical washers to prevent metal-to-metal contacts.
1. Provide vibration isolation spring with cap and pad type isolator, securely retained in unit.
 2. Provide neoprene pad, securely retained in unit.
 3. Provide fiberglass pad or shape, securely retained in unit, with threaded metal top plate.
 4. Provide removable spacer in each unit, to limit deflection during installation to rated-load deflection.
- I. Riser isolators - manufacturer's standard pad type isolator bonded to steel plate, formed for welding to pipe sleeve extension.

- J. Riser support isolators - manufacturer's standard pad type isolator laminated between two formed steel plate members, one for welding to pipe sleeve extension and other for welding to pipe riser.
- K. Flexible duct connectors - laminated flexible sheet of cotton duct and sheet elastomer (butyl, neoprene or vinyl), reinforced with steel wire mesh where required for strength to withstand duct pressure indicated. Form connectors with full faced flanges and accordin bellows to perform as flexible isolation unit, and of manufacturer's standard length for each size unless otherwise indicated. Equip each unit with galvanized steel retaining rings for airtight connection with ductwork.
- L. Flexible pipe connectors:
 - 1. For non-ferrous piping, provide bronze hose covered with bronze wire braid with copper tube ends or bronze flanged ends, brase-welded to hose.
 - 2. For ferrous piping, provide stainless steel hose covered with stainless steel wire braid with NPT steel nipples or 150 psi ANSI flanges, welded to hose.
 - 3. Rubber flexible pipe connectors - provide of rubber and butyl construction with integral full faced duck and butyl flanges, internally steel wire reinforced, and furnished complete with steel retaining rings. Select with temperature and pressure ratings to suit intended service.
 - 4. Manufacturer - subject to compliance with requirements, provide vibration isolation products of one of the following:
 - a. Korfund Dynamics Corp.
 - b. Mason Industries, Inc.
 - c. Vibration Eliminator Co., Inc.
 - d. Vibration Mountings and Controls, Inc.

PART 3 - EXECUTION

3.01 PERFORMANCE OF ISOLATORS

- A. General - comply with minimum static deflections recommended by the American Society of Heating, Refrigerating and Air Conditioning Engineers, including definitions of critical and noncritical locations, for selection and application of vibration isolation materials and units as indicated.
- B. Manufacturer's recommendations - except as otherwise indicated, comply with manufacturer's recommendations for selection and application of vibration isolation materials and units.

3.02 APPLICATIONS

- A. General - except as otherwise indicated, apply the following types of vibration isolators at indicated locations or for indicated items of equipment. Selection is Installer's option where more than one type is indicated.
- B. Neoprene pad type isolators - install where the following equipment is indicated:
 - 1. Floor mounted air handling units, in noncritical locations.

- C. Equipment rails and spring isolators - install where the following floor mounted equipment is indicated:
1. Air handling units, 7 1/2 H.P. and larger.
 2. Centrifugal fans, 7 1/2 H.P. and larger.
- D. Fabricated equipment base and spring isolators - install where the following equipment is indicated:
1. Centrifugal fans.
 2. Reciprocating refrigeration compressor, in noncritical locations.
- E. Roof curb isolators - install where the following equipment is located on roof curbs over critical locations:
1. Air handling units.
 2. Rooftop air conditioning units.
 3. Fan or blower units, of more than 1.5 H.P.
- F. Isolation hangers - install where the following suspended equipment is indicated:
1. Package air handling units.
 2. Pipe over 1" pipe size, located in mechanical equipment rooms and each run connected to vibration isolation mounted equipment for a distance of 100 diameters but not less than 50' - 0".
 3. Ductwork (except flexible ductwork), located in mechanical equipment rooms, and each run connected to vibration isolation mounted equipment for a distance of 50' - 0".
 4. Sound traps in ductwork.
 5. Ductwork, where air velocity is 3000 fpm or greater.
- G. Riser isolators - install where the following risers pass through floors and roofs, provide support type where riser support is required:
1. Pipe risers.
 2. Pipe risers, within 50' - 0" of connection with vibration isolation mounted equipment.
 3. Pipe risers, in critical locations.
 4. Pipe risers, 2" pipe size and larger, in critical locations.
 5. Ductwork risers, in critical locations.
 6. Ductwork risers, where air velocity is 3000 fpm or greater.
 7. Ductwork risers, within 50' - 0" of connection with vibration isolation mounted equipment.
- H. Flexible duct connectors - install at the following ductwork connections:
1. Connections with vibration isolation mounted air handling equipment.
 2. Connections with fixed wall louvers for air intake and exhausts.
 3. Where ductwork, 1.0 square foot and greater, changes directions in critical locations.
- I. Flexible pipe connectors - install in piping systems at the following location:
1. Connections, 3/4" pipe size and larger, with vibration isolation mounted equipment.

3.03 INSTALLATION

- A. General - except as otherwise indicated, comply with manufacturer's instructions for installation and load application to vibration isolation materials and units. Adjust to ensure that units do not exceed rated operating deflections or bottom out under loading, and are not short circuited by other contacts or bearing points. Remove space blocks and similar devices (if any) intended for temporary protection against overloading during installation.
- B. Anchor and attach units to substrate and equipment as required for secure operation and to prevent displacement by normal forces, and as indicated.
- C. Adjust leveling devices as required to distribute loading uniformly onto isolators. Shim units as required where leveling devices cannot be used to distribute loading properly.
- D. Locate isolation hangers as near overhead support structure as possible.
- E. Weld riser isolator units in place as required to prevent displacement from loading and operations.
- F. Bond flanges of flexible duct connectors to ducts and housings to provide airtight connections. Seal seams and penetrations to prevent air leakage.
- G. Flexible pipe connectors - install on equipment side of shutoff valves, horizontally and parallel to equipment shafts wherever possible.

3.04 DEFLECTION MEASUREMENTS

- A. Upon completion of vibration isolation work, prepare report showing measured equipment deflections for each major item of equipment as indicated.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15250 - MECHANICAL INSULATION

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

- A. Extent of mechanical insulation work required by this section is indicated on Drawings and by requirements of this section.
- B. Types of insulation and accessories specified in this section include the following:
 - 1. Type P-1, Sectional molded glass fiber pipe insulation.
 - 2. Type P-2, Sectional rigid foam glass pipe insulation.
 - 3. Type P-3, Flexible elastomeric cellular pipe insulation.
 - 3. Type P-5, Aluminum jacketing for piping
 - 4. Type P-6, Hydrophobic 'pourable' underground pipe insulation
 - 5. Type D-2, Flexible glass fiber blanket-aluminum foil facing.
 - 6. Type D-4, Aluminum jacketing for ductwork.

1.02 QUALITY ASSURANCE

- A. Fire Hazard Classification: In accordance with ASTM E-84.
- B. NFPA 255 and UL 723, for insulation systems, including insulation, adhesives and coverings, not to exceed the following:
 - 1. Flame spread 25.
 - 2. Fuel contributed 50.
 - 3. Smoke developed 50.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturers specification sheets, installation instructions, fire and smoke ratings. Submit schedule matching insulation type to mechanical systems and equipment.

PART 2 - PRODUCTS

2.01 INSULATION - TYPE P1

- A. Sectional Molded Glass Fiber Pipe Insulation: Minimum density 4.5 pounds per cubic foot. Factory applied jacket consists of white, flame retardant jacket of .001 inch minimum aluminum foil, laminated to glass fiber reinforced kraft paper with a flame retardant snuffer type adhesive. Jacket has minimum 1-1/2 inch longitudinal sealing lap. Minimum circumferential sealing strips, 3 inches wide.
- B. Fittings Valves and Flanges: Molded, precut, or segmental insulation equal in thickness to adjoining pipe insulation. Alternate, hydraulic-setting insulating cement. Surface finish pre-molded PVC fitting cover system. Alternate: fitting mastic, fiberglass, reinforcing strips and top coat of fitting mastic.

C. Manufacturers:

1. Certain Teed
2. Knauf Fiberglass
3. Schuler
4. Owens-Corning
5. U.S.G.

2.02 INSULATION - TYPE P2

- A. Sectional, Rigid, Foamed Glass Pipe Insulation: Minimum density 8.5 pounds per cubic foot.
- B. Fittings, Valves, and Flanges: Molded or segmental foamed glass insulation equal in thickness to adjoining pipe insulation.
- C. Exposed and Concealed Pipe: If exposed to weather, finish additionally with .016 inch embossed aluminum jacket, secured with 3/4 inch by .015 inch aluminum strappings and seals.
- D. Fittings, Valves, and Flanges: Insulate with preformed or mitered segments of foamed glass, wired, or taped in place and finished with 2 coats of vinyl fitting mastic with glass fabric reinforcement between coats.
- E. Manufacturer: Pittsburgh Corning Corp.

2.03 INSULATION TYPE P-3

- A. Black flexible closed cell foamed elastomeric pipe insulation with inner and outer surface skin, extruded tubing. Water permeability .17 to .28 perm-inch; water absorption 3 to 10 percent.
- B. Manufacturers:
 1. Armstrong
 2. Rubatex Corp.

2.04 ALUMINUM JACKETING FOR PIPING - TYPE P5

- A. Jacketing: Aluminum roll, Type 3003, 0.016 inch thick, 36 inches wide with moisture barrier for cold applications, without moisture barrier for hot applications.
- B. Fittings: Aluminum, preformed for tees, valves, 90 degree and 45 degree elbows: Childers ELL JAC or Premetco International.

2.05 HYDROPHOBIC 'POURABLE' FOR UNDERGROUND PIPING - TYPE P6

- A. Pourable: 100% Calcium Carbonate approximately 60-62 lbs/ sq ft bulk density with 4-6 mil thick polyethylene top vapor barrier.
- B. Manufacturer:
 1. Dritherm International, Inc.

2.06 INSULATION - TYPE D2

- A. Flexible glass fiber duct blanket. Minimum density: 1 pound per cubic foot.
- B. Facing: Aluminum foil, minimum .001 inches thick, reinforced with glass fiber yarn mesh and laminated to 40 pound permanently treated, fire-resistant kraft.
- C. Manufacturers:
 - 1. Certain Teed
 - 2. Knauf Fiberglass
 - 3. Schuller
 - 4. Owens-Corning
 - 5. U.S.G.

2.07 ALUMINUM JACKETING FOR DUCTWORK D-4

- A. Jacketing: Aluminum preformed, Type 3003, 0.016 inch thick rolls with moisture barrier for cold applications, without moisture barrier for hot applications. [Childers] [Premetco International].
- B. Stainless Steel Strip: AISI Type 301, 0.015 inches thick, 1/2 inch wide, No. 5 edge, annealed, embossed with "NON-ASBESTOS".
- C. Strapping Seals: AISI Type 302, stainless steel, 1/2 inch wide. Interlaken 44.
- D. Adhesive: Silicone rubber sealant. General Electric RTV. Dow Corning. Polymer One Sealant.

PART 3 - EXECUTION

3.01 INSTALLATION - GENERAL

- A. Apply insulation in accordance with the Schedule of Insulation at the end of this Section.
- B. Use only insulation and finish materials including adhesives, cements, and mastics which conform to the requirements of all local codes and ordinances.
- C. Fire resistant adhesive is highly flammable in liquid form. Eliminate welding, smoking, or other sources of ignition during application.
- D. Apply insulation after all piping pressure tests, as described in Piping Installation Procedure, have been completed.
- E. Clean surfaces of loose scale, dirt, oil, and other foreign matter and dry prior to insulating.
- F. Apply insulation to completely cover piping surface. Do not insulate over weld certification stamps.
- G. "Exposed" as used in this section means exposed to view. "Concealed" means concealed to view such as in furred chases or

above suspended ceiling. Penthouse and equipment rooms are considered exposed locations.

- H. Fill surface imperfections in the insulation such as chipped edges, small joints or cracks, and small voids or holes with appropriate insulation material and smooth with skim coat of hydraulic-setting insulating cement. Vapor barriers shall be continuous and unbroken at hanger installations.
- I. Fit inside diameter of insulation sections or segments to outside curvature of pipe or previous insulation layer.
- J. Where standard insulation shapes are not available, cut, score, or miter segments of appropriate block to fit contour of pipe. Stagger joints of adjoining segments. Fit insulation carefully and secure with No. 20 gage galvanized annealed steel wire. Finish with a smoothing coat of hydraulic-setting insulating cement.
- K. Insulate valves, strainer, fittings, and flanges with identical material, density, thickness, and surface finish as the piping insulation. All edges shall be filled with filler and finished with a smoothing coat of hydraulic-setting insulating cement.
- L. Insulate the entire surface of fittings and strainers. Insulate valves up to and including bonnets, unless authorized otherwise by Project Engineer. Do not cover removable valve bonnets.
- M. Insulate strainers to permit removal of the basket without disturbing the insulation of the strainer body. Strainer covers shall be molded and taped to upper section of insulation.
- N. Bevel the ends of pipe insulation adjacent to flanges to permit bolt removal. Provide a collar of sectional block insulation over the flanges and extend a minimum of 2 inches over the adjacent pipe insulation. Fasten with staples to permit easy removal. Prior to applying collar fill annular spaces with loose insulation.
- O. Insulate all piping through sleeves.
- P. Where pipelines pass through masonry walls or floors, completely fill the space between outside of pipe or insulation and the inside of the sleeve or framed opening with fibrous mineral wool or fiberglass pipe insulation.
- Q. When it is unavoidable and hangers for cold lines must be installed directly on the pipe, insulate and finish the entire hanger and the rod for a length of not less than 12 inches above the pipe.
- R. For hot lines supported on rollers, provide pipe covering protection saddles and fill the hollow interior of saddles with insulating cement or fibrous glass.
- S. Insulate Dresser-type couplings and other gasketed joints in refrigerant systems in a manner to allow removal of insulation, without damage, for repair and leak-checking of couplings and gasketed joints.
- T. Apply insulation to completely cover metal surfaces.

- U. Cut, score, or miter insulation to fit shape and contour of ductwork and equipment. Where surfaces are flat, cylindrical, or regularly curved, use premolded blocks or segments.
- V. Where required, provide permanently fastened angles or plates to support insulation.
- W. Apply insulation on cover plates, heads and access openings as separate sections, with insulation cut back for access to boltheads and other fasteners.
- X. Do not insulate over nameplates. Cut back insulation and line the insulation edges with 24 gage galvanized steel.
- Y. Surface Finish.
 - 1. Apply surface finish to present a tight, smooth appearance.
 - 2. Do not apply sealant or cement until all previous applications of cement and adhesives have thoroughly dried.
 - 3. Extend surface finish to protect all insulation surfaces. Prevent raw edges or ends of insulation from being exposed.

3.02 APPLICATION OF TYPE P1 INSULATION

- A. Exposed and Concealed Pipe: Staple longitudinal lap unless factory pre-sealed laps are supplied or adhesive is used, with 9/16 inch coated staples, 2 inches on center, butt adjoining sections firmly together. Apply butt-joint strips, making sure coated or dull side is out. Center the strip for a snug fit and fasten with 2 staples, one each approximately 1/2 inch from each edge.
- B. Exposed and Concealed Fittings, Valves, Flanges: Insulate with molded, pre-cut or segmental insulation equal in thickness to adjoining pipe insulation. Alternate: Hydraulic-setting insulating cement same thickness as adjoining insulation. Alternate: Pre-molded PVC fitting cover system.
- C. Surface Finish (Indoor)
 - 1. Exposed and Concealed Pipe: No additional finish required.
 - 2. Exposed and Concealed Fittings, Valves, Flanges: Apply a skim coat of insulating cement to produce a smooth surface. After cement is dry, apply a light coat of fitting mastic. While mastic is still wet, wrap the fitting with fiberglass reinforcing cloth strips overlapping the preceding layer by 1 to 2 inches and adjoining pipe by 2 inches, and embedding the cloth into the mastic. When dry, apply a second coat of mastic over the entire fitting to a minimum wet thickness of 3/64 inch. Alternate: Apply one piece pre-molded PVC fitting covers with galvanized coated tack fasteners.

Tape circumferential joint between insulation and premolded fitting cover with 2 inch pressure sensitive polyvinyl tape.
 Note: Wipe all joints clean before applying tape.
 Alternate: Apply 8 ounce canvas between 2 coats of lagging cement.

3.03 APPLICATION OF TYPE P2 INSULATION

- A. Exposed and Concealed Pipe: Seal lap of vapor barrier jacket with fire-resistant adhesive. Staple longitudinal lap with three 9/16 inch coated staples, applying lagging cement over staples. Adjoining sections of pipe insulation are to be butted tightly together and the vapor barrier continued by sealing the circumferential joint with butt joint strips adhered with fire-resistant adhesive.
- B. Exposed and Concealed Fittings, Valves, Flanges: Insulate with molded or segmental foamed glass insulation equal in thickness to adjoining pipe insulation and secured with No. 20 gage galvanized annealed steel wire.
- C. Surface Finish (Indoor)
 - 1. Exposed and Concealed Pipe: No additional finish required.

3.04 APPLICATION OF TYPE P3 INSULATION

- A. Slit insulation lengthwise. Coat longitudinal seams and joints with adhesive and install it on pipe. Miter insulation at elbows and glue.
- B. Fully cover seams and butt joints with adhesive to assure a complete seal to maintain insulation efficiency and vapor barrier.
- C. Do not stretch insulation to obtain longer lengths.
- D. Unless otherwise specified, completely insulate common applications (such as hose stations, drinking fountains, etc.) for chilled and hot water.
- E. On cold applications, insulate valves, unions, and pipe installed with direct contact clamp hangers, butt insulation to hanger both sides and install oversized materials over hanger. Lap 1 to 2 inches minimum onto the smaller sized material.
- F. On cold applications wrap all gages, petcocks, etc. with Cork Insulation Tape.

3.05 APPLICATION OF TYPE P5 INSULATION

- A. Provide a 1/2 inch to 3/4 inch safety edge on all exposed longitudinal seams (except corrugated aluminum jacketing).
- B. Longitudinal lap to be a minimum of 2 inches, located on horizontal centerline. Overlap butt joints a minimum of 3 inches.
- C. Install 1/2 inch wide stainless steel strips located on the edge of butt joint, and then on 12 inch centers thereafter. Use two strapping seals. The first to keep the strap tight and the second to cover and secure the cut end of the strap.
- D. Use aluminum butt straps where jacket cannot be overlapped (gored fittings and flanges). Use 1/2 inch wide stainless steel strips to hold butt straps.

- E. Seal seams, joints or openings in the jacket that cannot be sealed by overlapping the aluminum jacket or by butt straps with silicone rubber.
- F. Jacket both 45 degree and 90 degree elbows through 10 inches with preformed aluminum jackets. For fittings 12 inches and larger, use mitred fittings.
- G. Jacket other fittings or valves with sheet aluminum fabricated as necessary. Use aluminum jacketing only for end caps.
- H. Install "S" clips on vertical piping to hold jacket in place.
- I. Lap Directions, Horizontal Lines: Circumferential laps on exterior jacketing shall face east or south. Longitudinal laps shall face down (upper and lower) located on horizontal center line.
- J. Lap Directions, Vertical Lines: Interior or exterior jackets shall be overlapped shingle style (upper over lower). Exterior longitudinal laps shall face east or south.

3.06 APPLICATION OF TYPE P6 INSULATION

- A. GENERAL: Install hydrophobic pourable underground piping insulation in strict compliance with manufacturers installation guidelines and specifications. Provide and install all manufactures required forms, spacers, pipe supports, etc including polyfilm top vapor barrier and minimum 1'-6" backfill. (note: minimum depth of pipe to be 3'-0")

3.07 APPLICATION OF TYPE D4 INSULATION

- A. For round duct, fasten aluminum jacket in place with stainless steel strips. For rectangular duct, apply strips (corner beads) and sheet material secured with screws or pop rivets. Ducts greater than 24 inches shall have cross breaks.
- B. Jacketing sequence shall be bottom, sides, then top.
- C. Overlap seams a minimum of 2 inches.
- D. After bands are secure, use stainless steel or aluminum screws or pop-rivets on seams where necessary.
- E. Apply jacket shingle style on risers (upper jacket over lower) to provide drainage. Use stainless steel strip to secure jacketing.
- F. Seal breaks and seams in aluminum jacket with silicone rubber sealant.

3.08 SCHEDULE OF PIPING INSULATION

<u>Service</u>	<u>Size</u>	<u>Type</u>	<u>Thickness</u>
Heating Hot Water	Thru 1-1/4"	P1	1-1/2"
Heating Hot Water	1-1/2" & over	P1	2"
Steam	Thru 3"	P1	2-1/2"
Steam	4" & over	P1	3"
Steam condensate	Thru 1-1/4"	P1	1-1/2"
Steam condensate	1-1/2" & over	P1	2"
Air Handling Unit Drain			
Line (Condensate)	All	P1	1/2" (a)
Refrigerant (piping)	Thru 2"	P2	1"
Refrigerant (piping)	Over 2"	P2	2"
Pipe Supports (b)	All	P3	Varies (b)
Chilled Water	Thru 6"	P1	2" *
(*underground piping 'pourable' insulation minimum thickness=6"all around top/bottom/sides of pipe)			

- a. All insulation thickness services shall be 1 inch thickness when applied outdoors-above ground. (Consider heating cables).
- b. Refer to D1.2.0, Insulation Protection at Pipe Support.

3.09 SCHEDULES OF DUCT INSULATION

<u>Insulation Service</u>	<u>Type</u>	<u>Thickness</u>
Concealed/Exposed Supply Ducts, etc (Refer to section 15290)	D2	2"

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15290 - DUCT INSULATION - INTERIOR

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and provisions of contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.02 SUMMARY

- A. This section includes duct and plenum insulation.
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Division 15 Section "Ductwork" for duct lining.

1.03 DEFINITIONS

- A. Hot Surfaces: Normal operating temperatures of 100 deg F or higher.
- B. Dual-Temperature Surfaces: Normal Operating temperatures that vary from hot to cold.
- C. Cold Surfaces: Normal operating temperatures less than 75 deg F.
- D. Thermal Conductivity (k-value): Measure of heat flow through a material at a given temperature difference; conductivity is expressed in units of Btu x inch/h x sq. ft. x deg F.
- E. Density: Is expressed in lb/cu. ft.

1.04 SUBMITTALS

- A. General: Submit the following in accordance with General Conditions of the Contract and Division 1 specification sections.
- B. Product and data for each type of duct insulation identifying k-value, thickness, and accessories.
- C. Material certificates, signed by the manufacturer, certifying that materials comply with specified requirements where laboratory test reports cannot be obtained.
- D. Material test reports prepared by a qualified independent testing laboratory. Certify insulation meets specified requirements.

1.05 QUALITY ASSURANCE

- A. Fire Performance Characteristics: Conform to the following characteristics for insulation including facings, cements, and adhesives, when tested according to ASTM E 84, by UL or other testing or inspecting organization acceptable to the authority having jurisdiction. Label insulation with appropriate markings of testing laboratory.
 - 1. Interior Insulation: Flame spread rating of 25 or less and a smoke developed rating of 50 or less.

1.06 SEQUENCING AND SCHEDULING

- A. Schedule insulation application after testing of duct systems.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering 'GREENGUARD' certified products that may be incorporated in the Work include, but are not limited to the following:
 - 1. Glass Fiber:
 - a. CertainTeed Corporation.
 - b. Knauf Fiberglass GmbH.
 - c. Manville.

2.02 GLASS FIBER

- A. Material: Inorganic glass fibers, bonded with a thermosetting resin.
- B. Jacket: All-purpose, factory-applied, laminated glass-fiber-reinforced, flame-retardant kraft paper and aluminum foil having self-sealing lap.
- C. Board: ASTM C 612, Class 2, semi-rigid jacketed board.
 - 1. Thermal Conductivity: 0.23 Btu x inch/h x sq. ft. x deg F average maximum at 75 deg F mean temperature.
 - 2. Density: 3 pcf average maximum.
- D. Blanket: ASTM C 553, Type II, Class F-1, jacketed flexible blankets. (maximum 25% compression installed)
 - 1. Thermal Conductivity: 0.23 Btu x inch/h x sq. ft. x deg F average maximum at 75 deg F mean temperature.

- E. Adhesive: Produced under the UL Classification and follow-up service.
 - 1. Type: Non-flammable, water-based.
 - 2. Service Temperature Range: Minus 20 to 180 deg F (Minus 29 to 82 deg C).
- F. Vapor Barrier Coating: Waterproof coating recommended by insulation manufacturer for outside service.

2.03 ACCESSORIES AND ATTACHMENTS

- A. Glass Cloth and Tape: Woven glass fiber fabrics, plain weave, pre-sized a minimum of 8 ounces per sq. yd.
 - 1. Tape Width: 4 inches
 - 2. Cloth Standard: MIL-C-20079H, Type I.
 - 3. Tape Standard: MIL-C-20079H, Type II.
- B. Bands: 3/4 inch wide, in one of the following materials compatible with jacket:
 - 1. Stainless Steel: Type 304, 0.020 inch thick.
 - 2. Aluminum: 0.0070 inch thick.
- C. Wire: 14-gauge nickel copper alloy, 16-gauge, soft-annealed stainless steel, or 16-gauge, soft annealed galvanized steel.
- D. Corner Angles: 28-gauge (0.3 mm), 1 inch by 1 inch (25 mm by 25 mm) aluminum, adhered to 2 inches by 2 inches (51 mm by 51 mm) kraft paper.
- E. Anchor Pins: Capable of supporting 20 pounds each. Provide anchor pins and speed washers of sizes and diameters as recommended by the manufacturer for insulation type and thickness.

2.04 SEALING COMPOUNDS

- A. Vapor Barrier Compound: Water-based, fire-resistive composition.
 - 1. Water Vapor Permeance: 0.08 perm maximum.
 - 2. Temperature Range: Minus 20 to 180 deg F.
- B. Weatherproof Sealant: Flexible-elastomer-based, vapor-barrier sealant designed to seal metal joints.
 - 1. Water Vapor Permeance: 0.02 perm maximum.
 - 2. Temperature Range: Minus 50 to 250 deg F.
 - 3. Cooler: Aluminum.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Surface Preparation: Clean, dry and remove foreign materials such as rust, scale, and dirt.

3.02 INSTALLATION

- A. Refer to schedules at the end of this section for materials, forms, jackets, and thicknesses required for each duct system.
- B. Select accessories compatible with materials suitable for the service. Select accessories that do not corrode, soften, or otherwise attack the insulation or jacket in either the wet or dry state.
- C. Install vapor barriers on insulated ducts and plenums having surface operating temperatures below 60 deg.
- D. Apply insulation material, accessories, and finishes according to the manufacturer's printed instructions.
- E. Install insulation with smooth, straight, and even surfaces.
- F. Seal joints and seams to maintain vapor barrier on insulation requiring a vapor barrier.
- G. Seal penetrations for hangers, supports, anchors, and other projections in insulation requiring a vapor barrier.
- H. Seal Ends: Except for flexible elastomeric insulation, taper ends at 45 degree angle and seal with lagging adhesive. Cut ends of flexible elastomeric cellular insulation square and seal with adhesive.
- I. Apply water based adhesives and coatings at the manufacturer's recommended coverage-per-gallon rate.
- J. Keep insulation materials dry during application and finishing.
- K. Install board insulation as follows:
 - 1. Adhesive and Band Attachment: Secure board insulation tight and smooth with at least 50 percent coverage of water based adhesive. Install bands spaced 12 inches apart. Protect insulation under bands and at exterior corners with metal corner angles. Fill joints, seams, and chipped edges with vapor barrier compound.
 - 2. Speed Washers Attachment: Secure insulation tight and smooth with speed washers and welded pins. Space anchor pins 18 inches apart each way and 3 inches from insulation joints. Apply vapor barrier coating compound to insulation in contact, open joints, breaks, punctures, and voids in insulation.
- L. Blanket Insulation: Install tight and smooth. Secure to ducts having long sides or diameters as follows:
 - 1. Smaller Than 24 Inches: Bonding water based adhesive applied in 6-inch (150-mm) wide transverse strips on 12-inch centers.

2. 24 inches and Larger: Anchor pins spaced 12 inches (300 mm) apart each way. Apply bonding adhesive to prevent sagging of the insulation.
3. Overlap joints 3 inches.
4. Seal joints, breaks, and punctures with vapor barrier compound.

3.03 JACKETS

- A. Foil and Paper Jackets (FP): Install jackets drawn tight. Install lap or butt strips at joints with material same as jacket. Secure with adhesive. Install jackets with 1-1/2 inches (40 mm) laps at longitudinal joints and 3 inches (75 mm) wide butt strips at end joints.

1. Seal openings, punctures, and breaks in vapor barrier jackets, and exposed insulation with vapor barrier compound.

3.04 APPLICATIONS

- A. General: Materials and thicknesses are specified in schedules at the end of this Section.
- B. Duct Systems: Insulate all new interior ductwork.

3.05 DUCT SYSTEMS INSULATION SCHEDULE

- A. All interior supply and return ducts:

Material	Type	Installed R-value	Vapor Barrier Req'd	Field- Applied Jacket
Glass Fiber	Blanket	6.0	Yes	None

- B. All outdoor air intake ducts and outdoor air plenums:

Material	Type	Installed R-value	Vapor Barrier Req'd	Field- Applied Jacket
Glass Fiber	Blanket	8.0	Yes	None

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15511 - 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 ductwork, 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 Work
 - 2. Section 07900 - Caulking
 - 3. Section 04200 - Unit Masonry
 - 4. Section 09200 - Lath and Plaster
 - 5. Section 09250 - Gypsum Wall Board
 - 6. Section 15050 - Basic Materials and Methods
 - 7. Section 15250 - Mechanical Insulation

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.
- 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 15 - MECHANICAL

SECTION 15515 - HYDRONIC SPECIALTIES

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 hydronic specialties required by this section is indicated on drawings, and/or specified in other Division 15 hydronic piping system sections.
- B. Types of hydronic specialties specified in this section include the following:
 - 1. Balance valves.
 - 2. Vent valves.
 - 3. Flow control valves.
 - 4. Diverting fittings.
 - 5. Air separators.
 - 6. Compression tanks.
 - 7. Pump discharge valves.
 - 8. Shot feeders.
 - 9. Water relief valves.
 - 10. Pressure reducing valves.
 - 11. RPZ - Backflow Preventer

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. Refer to requirements pertaining to substitute materials and equipment.

1.04 SUBMITTALS

- A. Product data - submit catalog cuts, specifications, installation instructions and dimensioned drawings for each type of manufactured hydronic specialty. Include pressure drop curve or chart for each type and size of hydronic specialty.

- B. Shop drawings - submit for fabricated specialties, indicating details of fabrication, materials and method of support.
- C. Maintenance data - submit maintenance data and spare parts lists for each type of manufactured hydronic specialty. Include this data in maintenance manual.
- D. Hydronic specialty types - provide hydronic specialties of same type by same manufacturer.

PART 2 - PRODUCTS

2.01 MANUFACTURED HYDRONIC SPECIALTIES

- A. General - provide factory fabricated hydronic specialties recommended by manufacturer for use in service indicated. Provide hydronic specialties of types and pressure ratings indicated for each service, or if not indicated, provide proper selection as determined by the engineer 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 the engineers' option, but more than one type cannot be used on project.
- B. Balance valves:
 - 1. General - provide balance valves as indicated, of one of the following types:
 - a. Threaded ends 2" and smaller - Class 125, bronze body, ball valve with memory stop.
 - b. Soldered ends 2" and smaller - Class 125, bronze body, ball valve with memory stop.
 - c. Threaded, soldered, of flanged end globe style providing three (3) functions:
 - 1) Precise flow measurement
 - 2) Precision flow balancing
 - 3) Positive shut-off, no drip seat, teflon disk, 1-1/2" to 2" size - drain connection with protective cap.
- C. Vent valves:
 - 1. Manual vent valves - provide manual vent valves designed to be operated manually with screwdriver or thumbscrew, 1/8" N.P.T. connection.
 - 2. Automatic vent valves - provide automatic vent valves designed to vent automatically with float principle, stainless steel float and mechanisms, cast iron body,

pressure rated for 125 psi, 1/2" N.P.T. inlet and outlet connections.

3. Manufacturer - subject to compliance with requirements, provide vent valves of one of the following:

- a. Bell & Gossett, ITT Fluid Handling Div.
- b. Taco, Inc.
- c. Armstrong Co.

D. Flow control valves:

1. General - provide flow control valves pressure rated for 125 psi, containing lift check assembly which will automatically open by means of pump flow pressure, and automatically close when pump is not operating. Provide with means to manually open in case of pump failure.

- a. Threaded ends 2" and smaller - cast iron body, bronze check mechanism, screw-in bonnet, straight or angle pattern.
- b. Soldered ends 1 1/4" and smaller - cast bronze body, bronze check mechanism, screw in bonnet, straight or angle pattern.
- c. Threaded ends 2 1/2" through 4" - cast iron body, bronze check mechanism, screw in bonnet, straight or angle pattern.

2. Manufacturer - subject to compliance with requirements, provide flow control valves of one of the following:

- a. Bell & Gossett, ITT Fluid Handling Div.
- b. Taco, Inc.
- c. Armstrong Pump Co.

E. Diverting fittings:

1. General - provide diverting fittings as indicated for one pipe hydronic piping systems. Construct fittings of cast iron with threaded ends or wrought copper with solder ends, pressure rated for 125 psi. Provide indication on fitting of direction of flow for supply or return applications. Furnish flow and pressure drop curves based on manufacturer's testing with submittal.
2. Manufacturer - subject to compliance with requirements, provide diverting fittings of one of the following:

- a. Armstrong Pumps, Inc.
- b. Bell & Gossett, ITT Fluid Handling Div.

F. Air Separators:

1. General - provide air separators pressure rated for 125 psi. Select capacity based on total system gpm.
2. Dip tube fittings - provide dip tube fittings in boilers as

indicated to prevent free air collected in boiler from rising into system.

3. In-Line air separators - provide in-line air separators as indicated. Construct sizes 1 1/2" and smaller of cast iron, and sizes 2" and larger of steel complying with ASME Boiler and Pressure Vessel Code and stamped with "U" symbol. Furnish National board Form U-1 denoting compliance.
4. Combination separator/strainer - provide external combination air separators/strainers as indicated. Construct of steel complying with ASME Boiler and Pressure Vessel Code and stamped with "U" symbol. Furnish National Board Form U-1 denoting compliance. Provide galvanized steel integral strainer with 3/16" perforations and free area of not less than 5 times cross sectional area of connecting lines. Provide tangential inlet and outlet connections and internal stainless steel air collector tube designed to direct released air into compression tank. Provide blowdown connections.
5. Manufacturer - subject to compliance with requirements, provide air separators of one of the following:
 - a. Armstrong Pumps, Inc.
 - b. Bell & Gossett, ITT Fluid Handling Div.
 - c. Taco, Inc.

G. Compression tank:

1. General - provide compression tanks of size and number as indicated. Construct of steel for 125 psi pressure rating complying with ASME Boiler and pressure Vessel Code and stamped with "U" symbol. Furnish National Board Form U-1 denoting compliance. Provide tapings in bottom of tank for tank fitting.
 - a. Tank fittings - provide tank fittings for compression tanks as indicated, sized for compression tank diameter. Design tank fittings for 125 psi pressure rating and include manual vent to establish proper air volume in tank on initial fill.
2. Manufacturer - subject to compliance with requirements, provide compression tanks and tank fittings of one of the following:
 - a. Armstrong Pumps, Inc.
 - b. Bell & Gossett, ITT Fluid Handling Div.
 - c. Taco, Inc.

H. Diaphragm type compression tanks:

1. General - provide diaphragm compression tanks of size and number as indicated. Construct tank of welded steel, constructed, tested and stamped in accordance with Section VII of the ASME Boiler and Pressure Vessel Code for a working pressure of 125 psi. Furnish National Board Form U-1 denoting compliance. Support vertical tanks with steel legs or base, support horizontal tanks with steel saddles. Provide specially compounded flexible diaphragm securely sealed into tank to permanently separate air charge from system water, to maintain design expansion capacity. Provide pressure gauge and air charging fitting.
2. Manufacturer - subject to compliance with requirements, provide diaphragm type compression tanks of the following:
 - a. Bell & Gossett, ITT Fluid Handling Div.
 - b. Armstrong Pumps, Inc.

I. Pump discharge valves:

1. General - provide pump discharge valves as indicated. Provide Non-slam check valve with spring loaded disc and calibrated adjustment feature permitting regulation of pump discharge flow and shutoff. Provide flanged cast iron valve body, pressure rated for 175 psi, maximum operating temperature of 300 degrees F. Provide straight or angle pattern as required.
2. Manufacturer - subject to compliance with requirements, provide Pump discharge valves of one of the following:
 - a. Armstrong Pumps, Inc.
 - b. Bell & Gossett, ITT Fluid Handling Div.

J. Shot feeders:

1. General - provide shot feeders of 5 gallon capacity or otherwise as indicated, constructed of cast iron or steel, for introducing chemicals in hydronic system. Provide funnel and valve on top for loading drain valve in bottom, and recirculating valves on side. Construct for pressure rating of 125 psi.
2. Manufacturer - subject to compliance with requirements, provide shot feeders of one of the following:
 - a. Culligan USA
 - b. Laboratories, Subsidiary of Clow Corp.
 - c. Mougul Div., The Dexter Corp.

K. Water relief valves:

1. General - provide water relief valves as indicated, of size and capacity as selected by Installer for proper relieving capacity, in accordance with ASME Boiler and Pressure Vessel Code.
 - a. Combined pressure temperature relief valves - bronze body, test lever, thermostat, complying with ANSI Z21.22 listing requirements for temperature discharge capacity. Provide temperature relief at 210 degrees F (99 C) and pressure relief as indicated on drawing.
 - b. Pressure relief valves - bronze body, test lever, ASME rated. Provide pressure relief at as indicated on drawing.
2. Manufacturer - subject to compliance with requirements, provide water relief valves of one of the following:

L. Pressure Reducing Valves:

1. General - provide pressure reducing valves as indicated, of size and capacity as selected by Installer to maintain operating pressure on boiler system.
2. Construction - brass body, low inlet pressure check valve, inlet strainer removable without system shutdown, non-corrosive valve seat and stem, factory set at operating pressure.
3. Manufacturer - subject to compliance with requirements, provide pressure reducing valves of one of the following:
 - a. Bell & Gossett, ITT Fluid Handling Div.
 - b. Taco, Inc.
 - c. Armstrong Pumps, Inc.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Balance valves:

1. General - Install on each hydronic terminal and elsewhere as indicated.

B. Vent valves:

1. Manual vent valves - install manual vent valves on each hydronic terminal at highest point, and on each hydronic piping drop in direction of low for mains, branches and runouts and elsewhere as indicated.

2. Automatic vent valves - install automatic vent valves at top of each hydronic riser and elsewhere as indicated. Install shutoff valve between riser and vent valve, pipe outlet to suitable plumbing drain, or as indicated.
- C. Flow control valves:
1. General - install flow control valves on discharge of each pump serving a hot water heating system or zone and elsewhere as indicated. Install in upright position in a horizontal line with adequate clearance for service and replacement. Adjust flow sensitivity for automatic operation.
- D. Diverting fittings:
1. General - install diverting fittings as indicated and in accordance with manufacturer's instructions. Position fittings on supply and return mains with proper orientation for flow.
- E. Air separators:
1. Dip tube fittings - install dip tube fittings in boiler outlet in accordance with manufacturer's instructions. Run piping to compression tank pitched towards tank at 1" rise in 5' runs (1.7%).
 2. In-Line air separators - install in-line air separators in pump suction lines. Connect inlet and outlet piping. Run piping to compression tank pitched towards tank at 1" rise in 5' run (1.7%). Install drain valve on units 2" and over.
 3. Combination separator/strainer - install external combination separators/strainers in pump suction lines. Connect inlet and outlet piping. Run piping to compression tank pitched towards tank at 1" rise in 5' run (1.7%). Install blowdown valve and piping. Remove and clean strainer after 24 hours and again after 30 days of system operation.
- F. Compression tanks:
1. General - install compression tanks on trapeze hangers sized for tank fully loaded, or otherwise as indicated. Install tank fitting and drain valve in tank bottom and charge tank in accordance with manufacturer's instructions.
- G. Diaphragm type compression tanks:
1. General - install diaphragm type compression tanks on floor as indicated, in accordance with manufacturer's instructions. Vent and purge air from hydronic system, charge tank with proper air charge as recommended by manufacturer.

H. Pump discharge valves:

1. General - at engineers option, install pump discharge valves on each pump discharge line in lieu of separate shutoff valve, check valve, and balance cock. Install in horizontal or vertical position with stem in upward position, allow clearance above stem for check mechanism removal. After hydronic system has been completed, mark calibrated name plate with stripe of yellow lacquer to permanently mark final balanced position.

I. Shot feeders:

1. General - install shot feeders on each hydronic system at pump discharge and elsewhere as indicated. Install in upright position with top of funnel not more than 48" above floor. Install in pump discharge line as indicated.

J. Water relief valves:

1. General - Install on hot water generators and elsewhere as indicated. Pipe discharge to floor. Comply with ASME Boiler and Pressure Vessel Code. Cut discharge pipe at 45° angle.

K. Pressure reducing valves:

1. Install for each hot water boiler or heat exchanger as indicated, and in accordance with manufacturer's installation instructions.

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 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
15755 - EXHAUST FANS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: HVAC Power Ventilators
- B. Related Sections:
 - 1. Division 1 Through Division 14 - General Requirements
 - 2. Division 1 Through Division 14 - Thermal and Moisture Protection
 - 3. Division 1 Through Division 14 - Finishes
 - 4. Division 15 - Heating, Ventilating, and Air-Conditioning (HVAC)
 - 5. Division 16 - Electrical

1.02 REFERENCES

- A. Air Movement and Control Association Inc. (AMCA):
 - 1. 99 - Standards Handbook
 - 2. 200 - Publication, Air Systems
 - 3. 201-90 - Publication, Fans and Systems
 - 4. 202-88 - Publication, Troubleshooting
 - 5. 203-90 - Publication, Field Performance Measurement of Fan Systems
 - 6. 211-05 - Publication, Certified Ratings Program - Product Rating Manual for Fan Air Performance
 - 7. 300-96 - Standard Reverberant Room Method for Sound Testing of Fans
 - 8. 311-05 - Publication Certified Ratings Program - Product Rating Manual for Fan Sound Performance
 - 9. 99-0401-86 - Classification for Spark Resistant Construction
 - 10. 99-2408-69 - Operating Limits for Centrifugal Fans
- B. Air Movement and Control Association Inc. (AMCA), American National Standards Institute (ANSI):
 - 1. 204-05 - Standard Balance Quality and Vibration Levels for Fans
 - 2. 210-99 - Standard Laboratory Methods of Testing Fans for Aerodynamic Performance Rating
- C. American National Standards Institute (ANSI):
 - 1. 11-r1999 - Method of Evaluating Load Ratings of Bearings
- D. American Society of Civil Engineers (ASCE):
 - A. 7-02 - Minimum Design Loads for Building and Other Structures
- E. American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc (ASHRAE):
 - 1. Chapter 45 - 2003 handbook, HVAC Applications
 - 2. Chapter 7 - 2001 Fundamentals handbook, Sound-Vibration

3. Chapter 32 - 2001 Fundamentals handbook, Duct Design
 4. Chapter 18 - 1992 HVAC System and Equipment handbook, Fans
- F. American Society for Testing and Materials (ASTM):
1. E330-02 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylight and Curtain Walls by Uniform Static Air Pressure Difference
- G. National Fire Protection Association (NFPA):
1. 70 - National Electrical Code
 2. 90A-02 - Standard for the Installation of Air-Conditioning and Ventilating Systems
 3. 92A-06 - Recommend Practice for Smoke-Control System
 4. 92B-05 - Standard for Smoke Management System in Malls, Atria, and Large Areas
 5. 96-04 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
- H. Occupational Safety and Health Administration (OSHA):
1. 1910.212 - General requirements for Machine Guarding
 2. 1910.219 - General requirements for guarding safe use of mechanical power transmission apparatus
 3. 1926.300 - General requirements for safe operation and maintenance of hand and power tools
- I. Occupational Safety and Health Administration (OSHA):
1. 507 - Electric Fans
 2. 555 - Fire Dampers
 3. 555S - Smoke Dampers
 4. 705 - Standard Power Ventilators
 5. 762 - Standard Power Roof Ventilators for Restaurant Exhaust Appliances
 6. 793 - Snow Load

1.03 SUBMITTALS

- A. General: Submit in accordance with Section 01 33 00 Submittal Procedures
1. Provide dimensional drawings and product data on each fan.
 2. Provide fan curves for each fan at the specified operation point, with the flow, static pressure and horsepower clearly plotted.
 3. Provide outlet velocity and fan's inlet sound power readings for the eight octave bands, decibels, and sones.
 4. Strictly adhere to QUALITY ASSURANCE requirements as stated in section 1.04 of this specification.
 5. Provide manufacturer's certification that exhaust fans are licensed to bear Air Movement and Control Association (AMCA), Certified Rating Seal for sound and air performance.
 6. Installation, Operation, and Maintenance Manual (IOM): Provide manufacturer's installation, operations, and maintenance manual, including instructions on installation, operations, maintenance, pulley adjustment, receiving,

handling, storage, safety information and cleaning. A troubleshooting guide, parts list, warranty and electrical wiring diagrams.

1.04 QUALITY ASSURANCE

- A. Performance ratings: Conform to AMCA standard 211 and 311. Fans must be tested in accordance with ANSI/AMCA Standard 210-99 and AMCA Standard 300-96 in an AMCA accredited laboratory. Fans shall be certified to bear the AMCA label for sound and air performance seal.
- B. Classification for Spark Resistant Construction, levels A, B, and C conform to AMCA 99
- C. Each fan shall be given a balancing analysis which is applied to wheels at the outside radius. The maximum allowable static and dynamic imbalance is 0.05 ounces (Balance grade of G6.3).
- D. Comply with the National Electrical Manufacturers Association (NEMA), standards for motors and electrical accessories.
- E. The High Wind models have been analyzed and stamped by a state license P.E. to the ASCE 7-02 Standard which meets the IBC, Florida and Miami-Dade codes.
- F. Each High Wind model is subject to be certified by a third party to the ASTM E330 Static Pressure Difference Standard.
- G. All High Wind models have been analyzed using Computational Fluid Dynamics (CFD). The CFD simulates the flow of high speed (150 MPH) winds over the surface of objects.
- H. The Finite Element Analysis (FEA) is the results from the CFD and it can accurately predict the stress, strain, and deflection resulting from high wind loads.

1.05 DELIVERY, STORAGE, and HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer, material, products included, and location of installation.
- B. Storage: Store materials in a dry area indoor, protected from damage, and in accordance with manufacturer's instructions. For long term storage follow manufacturer's Installation, Operations, and Maintenance Manual
- C. Handling: Handle and lift fans in accordance with the manufacturer's instructions. Protect materials and finishes during handling and installation to prevent damage. Follow all safety warnings posted by the manufacturer.

1.06 WARRANTY

- A. 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 is not a limitation of, other rights Owner may have under Contract Documents.
 - 1. The warranty of this equipment is to be free from defects in material and workmanship for a period of 1 Yr (Standard) from the purchase date. Any units or parts which prove defective during the warranty period will be replaced at the Manufacturers option when returned to Manufacturer, transportation prepaid.
 - 2. Motor Warranty is warranted by the motor manufacturer for a period of one year. Should motors furnished by us prove

defective during the period, they should be returned to the nearest authorized motor service station.

1.07 MAINTENANCE

- A. Refer to Manufacturer's Installation, Operation and Maintenance Manual (IOM), to find maintenance procedures.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Greenheck, PO Box 410, Schofield, Wisconsin 54476. Phone (715) 359-6171 Fax (715) 355-2399. Website: www.greenheck.com
- B. Approved equivalent

2.02 DIRECT DRIVE ROOF DOWNBLAST CENTRIFUGAL EXHAUST FANS- GREENHECK MODEL G

- A. General Description:
 - 1. Refer to plans for equipment schedule(s).
 - 2. Downblast fan shall be for roof mounted applications
 - 3. Performance capabilities up to 14,500 cubic feet per minute (cfm) and static pressure to 2.75 inches of water gauge
 - 4. Fans are available in twenty sizes with nominal wheel diameters ranging from 8 inches through 30 inches (071 - 300 unit sizes)
 - 5. Maximum continuous operating temperature is 180 Fahrenheit (82.2 Celsius)
 - 6. Each fan shall bear a permanently affixed manufacturer's engraved metal nameplate containing the model number and individual serial number.
- B. Wheel:
 - 1. Constructed of Composite
 - 2. Non-overloading, backward inclined centrifugal
 - 3. Statically and dynamically balanced in accordance to AMCA Standard 204-05
 - 4. The wheel cone and fan inlet will be matched and shall have precise running tolerances for maximum performance and operating efficiency
- C. Motors:
 - a) Electronically Commutated Motor
 - a) Motor enclosure: ODP
 - b) Motor to be a DC electronic commutation type motor (ECM) specifically designed for fan applications. AC induction type motors are not acceptable. Examples of unacceptable motors are: Shaded Pole, Permanent Split Capacitor (PSC), Split Phase, Capacitor Start and 3 phase induction type motors
 - c) Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase
 - d) Internal motor circuitry to convert AC power supplied to the fan to DC power to operate the motor
 - e) Motor shall be speed controllable down to 20% of full speed (80% turndown). Speed shall be controlled by

either a potentiometer dial mounted at the motor or by a 0-10 VDC signal

- f) Motor shall be a minimum of 85% efficient at all speeds

D. Housing:

- 1. Motor cover, shroud, curb cap, and lower windband shall be constructed of heavy gauge aluminum
- 2. Shroud shall have an integral rolled bead for extra strength
- 3. Shroud shall be drawn from a disc and direct air downward
- 4. Lower windband shall have a formed edge for added strength
- 5. Motor cover shall be drawn from a disc
- 6. All housing components shall have final thicknesses equal to or greater than preformed thickness
- 7. Curb cap shall have pre-punched mounting holes to ensure correct attachment
- 8. Rigid internal support structure
- 9. Leak proof

E. Housing Supports and Drive Frame:

- 1. Drive frame assemblies shall be constructed of heavy gauge steel and mounted on vibration isolators

F. Vibration Isolation:

- 1. Rubber isolators
- 2. Sized to match the weight of each fan

G. Disconnect Switches:

- 1. NEMA rated: NEMA 1: indoor application no water. Factory standard.
- 2. Positive electrical shut-off
- 3. Wired from fan motor to junction box installed within motor compartment

H. Options/Accessories:

- 1. Birdscreen:
 - a) Material Type: Galvanized
 - b) Protects fan discharge
- 2. Roof Curbs (Where shown on schedule)
 - a) Type: GPI - Welded, straight sided curb with 2 inches of flashing flange and wood nailer
 - b) Mounted onto roof with fan
 - c) Material: Galvanized
 - d) Insulation thickness: 1 inch
- 3. Curb Extension:
 - a) Type: GPE - Bolted access door and damper holding tray
 - b) Material Type: Aluminum
 - c) Coating Type: N/A

4. Dampers:
 - a) Type: VCD-43, 115 VAC
 - b) Prevents outside air from entering back into the building when fan is off
 - c) Balanced for minimal resistance to flow
 - d) Galvanized frames with prepunched mounting holes

2.03 BELT DRIVE ROOF DOWNBLAST CENTRIFUGAL EXHAUST FANS - GREENHECK MODEL GB

A. General Description:

1. Refer to plans for equipment schedule(s).
2. Downblast fan shall be for roof mounted applications
3. Performance capabilities up to 44,700 cubic feet per minute (cfm) and static pressure to 2.5 inches of water gauge
4. Fans are available in twenty sizes with nominal wheel diameters ranging from 11 inches through 54 inches (071 - 540 unit sizes)
5. Maximum continuous operating temperature is 180 Fahrenheit (82.2 Celsius)
6. Each fan shall bear a permanently affixed manufacturer's engraved metal nameplate containing the model number and individual serial number.

B. Wheel:

1. Constructed of Aluminum
2. Non-overloading, backward inclined centrifugal
3. Statically and dynamically balanced in accordance to AMCA Standard 204-05
4. The wheel cone and fan inlet will be matched and shall have precise running tolerances for maximum performance and operating efficiency

C. Motors:

1. AC Induction Motor
 - a) Motor Enclosure: Open drip proof (ODP) - opening in the frame body and or end brackets
 - b) Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase
 - c) Accessible for maintenance

D. Shaft and Bearings:

1. Fan Shaft shall be ground and polished solid steel with an anti-corrosive coating
2. Permanently sealed bearings or pillow block ball bearings
3. Bearing shall be selected for a minimum L10 life in excess of 100,000 hours (equivalent to L50 average life of 500,000 hours), at maximum cataloged operating speed
4. Bearings are 100 percent factory tested
5. Fan Shaft first critical speed is at least 25 percent over maximum operating speed

E. Housing:

1. Motor cover, shroud, curb cap, and lower windband shall be constructed of heavy gauge aluminum

2. Shroud shall have an integral rolled bead for extra strength
 3. Shroud shall be drawn from a disc and direct air downward
 4. Lower windband shall have a formed edge for added strength
 5. Motor cover shall be drawn from a disc
 6. All housing components shall have final thicknesses equal to or greater than preformed thickness
 7. Curb cap shall have pre-punched mounting holes to ensure correct attachment
 8. Rigid internal support structure
 9. Leak proof
- F. Housing Supports and Drive Frame:
1. Drive frame assemblies shall be constructed of heavy gauge steel and mounted on vibration isolators
- G. Vibration Isolation:
1. Double studded true isolators
 2. No metal to metal contact
 3. Sized to match the weight of each fan
- H. Disconnect Switches:
1. NEMA rated: NEMA 1: indoor application no water. Factory standard.
 2. Positive electrical shut-off
 3. Wired from fan motor to junction box installed within motor compartment
- I. Drive Assembly:
1. Belts, Pulleys, and keys oversized for a minimum of 150 percent of driven horsepower
 2. Belts: Static free and oil resistant
 3. Fully machined cast iron type, keyed and securely attached to the wheel and motor shafts
 4. The motor pulley shall be adjustable for final system balancing
 5. Readily accessible for maintenance
- J. Options/Accessories:
1. Birdscreen:
 - a) Material Type: Galvanized
 - b) Protects fan discharge
 2. Curb Extension:
 - a) Type: GPE - Bolted access door and damper holding tray
 - b) Material Type: Aluminum
 - c) Coating Type: N/A
 3. Dampers:
 - A. Type: VCD-43, 24 VDC
 - B. Prevents outside air from entering back into the building when fan is off
 - C. Balanced for minimal resistance to flow
 - D. Galvanized frames with prepunched mounting holes

2.04 DIRECT DRIVE ROOF OR SIDEWALL UPBLAST CENTRIFUGAL EXHAUST FANS -
GREENHECK MODEL CUE

A. General Description:

1. Refer to plans for equipment schedule(s).
2. Discharge air directly away from the mounting surface.
3. Upblast fan shall be for roof mounted applications for fan sizes 060-300 or wall mounted applications for fan sizes 060-200.
4. Performance capabilities up to 14,700 cubic feet per minute (cfm) and static pressure to 3 inches of water gauge.
5. Fans are available in twenty-two sizes with nominal wheel diameters ranging from 9 inches through 30 inches (060 - 300 unit sizes).
6. Maximum continuous operating temperature for fan sizes 098-300 is 400 Fahrenheit (204.4 Celsius) and for fan sizes 060-095 is 160 Fahrenheit (71.1 Celsius)
7. Each fan shall bear a permanently affixed manufacture's engraved metal nameplate containing the model number and individual serial number

B. Wheel:

1. Material Type: Aluminum
2. Non-overloading, backward inclined centrifugal wheel
3. Statically and dynamically balanced in accordance to AMCA Standard 204-05
4. The wheel cone and fan inlet will be matched and shall have precise running tolerances for maximum performance and operating efficiency

C. Motors:

1. Electronically Commutated Motor
 - a) Motor enclosure: Open drip proof
 - b) Motor to be a DC electronic commutation type motor (ECM) specifically designed for fan applications. AC induction type motors are not acceptable. Examples of unacceptable motors are: Shaded Pole, Permanent Split Capacitor (PSC), Split Phase, Capacitor Start and 3 phase induction type motors
 - c) Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase
 - d) Internal motor circuitry to convert AC power supplied to the fan to DC power to operate the motor
 - e) Motor shall be speed controllable down to 20% of full speed (80% turndown). Speed shall be controlled by either a potentiometer dial mounted at the motor or by a 0-10 VDC signal
 - f) Motor shall be a minimum of 85% efficient at all speeds

D. Housing:

1. Constructed of heavy gauge aluminum includes exterior housing, curb cap, windband, and motor compartment housing. Galvanized material is not acceptable
2. Housing shall have a rigid internal support structure

3. Windband to be one piece uniquely spun aluminum construction and maintain original material thickness throughout the housing
 4. Windband to include an integral rolled bead for strength
 5. Curb cap base to be fully welded to windband to ensure a leak proof construction. Tack welding, bolting, and caulking are not acceptable
 6. Curb cap to have integral deep spun inlet venturi and pre-punched mounting holes to ensure correct attachment to curb
 7. Drive frame assemblies shall be constructed of heavy gauge steel and mounted on vibration isolators
 8. Breather tube shall be 10 square inches in size for fresh air motor cooling, and designed to allow wiring to be run through it
- E. Motor Cover:
1. Constructed of aluminum
- F. Vibration Isolation:
1. Double studded or pedestal style true isolators
 2. No metal to metal contact
 3. Sized to match the weight of each fan
- G. Disconnect Switches:
1. NEMA rated: NEMA 1: indoor application no water. Factory standard.
 2. Positive electrical shut-off
 3. Wired from fan motor to junction box installed within motor compartment
- H. Drain Trough:
1. Allows for one-point drainage of water, grease, and other residues
- I. Options/Accessories:
1. Curb Extension:
 - a) Type: GPE - Bolted access door and damper holding tray
 - b) Material Type: Aluminum
 2. Dampers:
 - a) Type: VCD-43, 115 VAC
 - b) Prevents outside air from entering back into the building when fan is off
 - c) Balanced for minimal resistance to flow
 - d) Galvanized frames with prepunched mounting holes

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including technical bulletins, product catalog installation instructions

3.02 EXAMINATION

- A. Examine areas to receive fans. Notify the Engineer of conditions that would adversely affect installation or subsequent

utilization and maintenance of fans. Do not proceed with installation until unsatisfactory conditions are corrected

3.03 PREPARATION

- A. Ensure roof openings are square, accurately aligned, correctly located, and in tolerance
- B. Ensure duct is plumb, sized correctly, and to proper elevation above roof deck. Install duct as specified in Air Distribution (Division 23)

3.04 INSTALLATION

- A. Install fans system as indicated on the Installation, Operation and Maintenance Manual (IOM) and contract drawings
- B. Install fans in accordance with manufacturer's instructions

3.05 SYSTEM STARTUP

- A. Refer to Installation, Operation, and Maintenance Manual (IOM)

3.06 CLEANING

- A. Clean as recommended by manufacturer. Do not use material or methods which may damage finish surface or surrounding construction

3.07 PROTECTION

- A. Protect installed product and finished surfaces from damage during construction
- B. Protect installed exhaust fans to ensure that, except for normal weathering, fans will be without damage or deterioration at time of substantial completion

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15800 - AIR DISTRIBUTION

1.01 GENERAL

- A. Construct all apparatus of materials suitable for the conditions encountered during operation.
- B. Where corrosion can occur, appropriate corrosion-resistant materials and assembly methods must be used including isolation of dissimilar metals against galvanic interaction.
- C. All factory applied acoustical and thermal insulation, including facing and adhesives, it to be fire-resistant and to conform to requirements of NBFU and State Codes.
- D. Where in contact with the air stream, protect insulation against erosion or flaking by a factory applied plastic or mat facing.
- E. Locate and arrange motors, eliminators, filters, cooling and heating coils, and other components and accessories so that they are accessible for repair, maintenance, and replacement.
- F. Mount grease fitting directly on bearings unless the latter are not readily accessible. Where equipment bearings are not visible or are inaccessible, provide easily accessible extensions to bearing lubrication fittings.
- G. Thoroughly clean the entire system before installing filters or operating the fans.
- H. On systems containing filters, install filters and permanently seal the filter frames airtight before operating the fans. The Contractor, at his own expense, shall replace all dirty filters before turning over the system to the Owner, and furnish the Owner with one complete set of replacement filters for all banks. Seal all outlets around the edges to prevent air leakage.
- I. Bracing and supports indicated are the minimum acceptable. Install additional bracing or supports to eliminate any distortion or vibration when the systems are operating or under tests.
- J. Install ducts, castings, and hangers plumb and level, with joints square and devoid of sharp edges.
- K. Unless otherwise specified, construct all duct work, including angles, bars, and other bracings, hangers, supports, and accessories of galvanized steel, all in accordance with schedules in the latest ASHRAE Guide.
- L. Diffusers, grilles, registers, and transfers shall be sized and located as shown on the drawings.

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 15891 - DUCTWORK

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Extent of ductwork is indicated on drawings and by requirements of this section.
- B. Types of ductwork required for project include the following:
 - 1. Heating supply and return air systems.
 - 2. Air conditioning supply and return air systems.
 - 3. Fresh air supply systems.
 - 4. Mechanical exhaust systems.
 - 5. Air relief systems.
 - 6. Fume hood exhaust systems.
 - 7. Wood shop exhaust system.
- C. Specific Duct System Classifications:

<u>Service</u>	<u>Material</u>	<u>Pressure Class</u>	<u>Velocity</u>
HVAC Supply	Galvanized Steel	2" WG	2500 FPM
Return Relief Exhaust	Galvanized Steel	1" WG Negative	1500 FPM
Air Plenums	Galvanized Steel	2" WG	2500 FPM
Fume hood	Stainless Steel	4" WG Negative	4000 FPM
Woodshop	Galvanized Steel	5" WG Negative	3000 FPM

- D. External insulation for ductwork is specified in Division 15 insulation sections, and is not included as work of this section.
- E. Duct accessories are specified in Division 15 Section and are included as work of this section.
- F. Inlets and outlets are specified in Division 15 section and are included as work of this section.
- G. Duct lining, as specified herein and indicated on drawings, is included as work of this section.

1.02 SUBMITTALS

- A. Product data: Submit manufacturer's specifications on manufactured products and factory fabricated ductwork, used for work of this section.
- B. Shop drawings: Submit dimensioned layouts of ductwork showing both the accurately scaled ductwork and its relation to space enclosure. Duct dimensions shall be external and provide adequate space to include lining and maintain internal dimensions

indicated on contract drawings. When appropriate, show modifications of indicated requirements made to conform to local shop practice, and how those modifications ensure that free area, materials, and rigidity are not reduced.

- C. As-Built drawings: At project closeout, submit as-built drawings of installed ductwork, duct accessories, and outlets and inlets, in accordance with requirements of Division 1.

1.03 QUALITY ASSURANCE AND REQUIRED CODES AND STANDARDS

- A. SMACNA standards (metal and flexible ductwork) - comply with SMACNA "HVAC Duct Construction Standards" latest edition for fabrication and installation of metal and flexible ductwork.
- B. SMACNA standards (thermoplastic duct) - comply with SMACNA "Thermoplastic Duct (PVC) Construction Manual" latest edition for fabrication and installation of thermoplastic (PVC) ductwork.
- C. SMACNA standards (fibrous glass ductwork) - comply with SMACNA "Fibrous Glass Duct Construction Standards" latest edition for fabrication and installation of fibrous glass ductwork.
- D. SMACNA standards (industrial duct) - comply with SMACNA "Accepted Industry Practice for Industrial Duct Construction"; "Accepted Industry Practice for Round Industrial Duct Construction"; and "Accepted Industry Practice for Square Industrial Duct Construction", latest editions, for fabrication and installation of industrial ductwork.
- E. SMACNA standards: Comply with SMACNA "Duct Liner Standards" for installations of duct liner in sheet metal ductwork.
- F. NYS compliance: Comply with NFPA 90 A "Standard for the Installation of Air Conditioning and Ventilating Systems."
- G. Mechanical Code of New York State

1.04 DELIVERY, STORAGE AND HANDLING

- A. Protect shop fabricated and factory fabricated ductwork, accessories and purchased products from damage during shipping, storage and handling. Prevent end damage and prevent dirt and moisture from entering ducts and fittings.
- B. Where possible, store ductwork inside and protect from weather. Where necessary to store outside, store above grade and enclose with waterproof wrapping.

PART 2 - PRODUCTS

2.01 DUCTWORK MATERIALS

- A. Exposed ductwork materials: Where ductwork is indicated to be exposed to view in occupied spaces, provide materials which are free from visual imperfections including pitting, seam marks,

roller marks, oil canning, stains and discolorations, and other imperfections, including those which would impair painting.

- B. Sheet metal: Except as otherwise indicated, fabricate ductwork from galvanized sheet steel complying with ANSI/ASTM A 527, lockforming quality, with ANSI/ASTM A 525, G90 zinc coating, mill phosphatized for exposed locations.
- C. Flexible Duct - Polyethylene Vapor Barrier Type. Where indicated, provide insulated flexible duct as follows:
 - 1. Galvanized steel helix, formed and mechanically locked to fabric.
 - 2. Aluminum foil trilaminate, fiberglass and aluminized polyester, mechanically locked (no adhesive).
 - 3. Exterior fiberglass insulation blanket factory wrapped. Thermal conductance, C factor, not more than 0.23.
 - 4. Outer jacket of gray fire retardant polyethylene material.
 - 5. UL listed per UL 181, Class 1 Air Duct.
 - 6. Operating temperature range -20 degrees to 250 degrees F.
 - 7. Flame spread less than 25, smoke developed less than 50.
 - 8. Working pressures:
 - a. 6 inch w.g. positive (all diameters).
 - b. 4 inch w.g. negative, through 16 inch diameters.
 - c. 1 inch w.g. negative, 18 to 20 inch diameters.
 - 9. Rated velocity: 4,000 FPM.
 - 10. Manufacturer:
 - a. Flexmaster, Type 3.
 - b. Clevaflex USA, Inc.
 - c. Thermaflex.
- D. Flexible Duct Fittings: Provide factory manufactured galvanized steel fittings. Use 45 degree laterals, ball mouth tees, spin collars, or conical tees for duct taps. 90 degree tees shall not be allowed.

2.02 DUCT LINER

- A. Fibrous-Glass Liner: Comply with NFPA 90A or NFPA 90B and with NAIMA AH124.
 - 1. Manufacturers:
 - a. CertainTeed Corp.; Insulation Group.
 - b. Johns Manville International, Inc.
 - c. Knauf Fiber Glass GmbH.
 - d. Owens Corning.
 - 2. Materials: ASTM C 1071; surfaces exposed to air stream shall be coated to prevent erosion of glass fibers.
 - a. Thickness: 2 inches.

- b. Thermal Conductivity (k-Value): 0.26 at 75°F (0.037 at 24°C) mean temperature.
- c. Fire-Hazard Classification: Maximum flame-spread index of 25 and smoke-developed index of 50 when tested according to ASTM E 84.
- d. Liner Adhesive: Comply with NFPA 90A or NFPA 90B and with ASTM C 916.
- e. Mechanical Fasteners: Galvanized steel suitable for adhesive attachment, mechanical attachment, or welding attachment to duct without damaging liner when applied as recommended by manufacturer and without causing leakage in duct.
 - 1) Tensile Strength: Indefinitely sustain a 50-lb- (23-kg) tensile, dead-load test perpendicular to duct wall.
 - 2) Fastener Pin Length: As required for thickness of insulation and without projecting more than 1/8 inch (3 mm) into air stream.
 - 3) Adhesive for Attaching Mechanical Fasteners: Comply with fire-hazard classification of duct liner system.

2.03 MISCELLANEOUS DUCTWORK MATERIALS

- A. General: Provide miscellaneous materials and products of types and sizes indicated and, where not otherwise indicated, provide type and size required to comply with ductwork system requirements including proper connection of ductwork and equipment.
- B. Duct sealant: Non-hardening, non-migrating mastic elastic sealant (type applicable for fabrication/installation detail) as compounded and recommended by manufacturer specifically for sealing joints and seams in ductwork. Liquid allowed for slip joints only. Silicone base duct sealer shall be used on duct joints exposed to weather.
- C. Ductwork support materials.
 - 1. For galvanized steel ductwork, provide hot dipped galvanized steel fasteners, anchors, rods, straps, trim and angles.
 - 2. For stainless steel ductwork, provide matching stainless steel support materials.
 - 3. For flexible ductwork, provide hot dipped galvanized steel support material.
- D. Duct Connector: Where duct system meets or exceeds pressure class of 2" w.g., positive or negative, incorporate the use of rolled, formed, machine manufactured duct connector.
 - 1. Manufacturer: Subject to compliance with requirements, provide duct connector of one of the following:
 - a. Ward.
 - b. Ductmate.
 - c. United McGill.
 - d. Flexmaster.

2.04 SHOP FABRICATION

- A. Shop fabricate ductwork in 4, 8, 10 or 12 foot lengths, unless otherwise indicated or required to complete runs. Pre-assemble work in shop to greatest extent possible, so as to minimize field assembly of systems. Disassemble systems only to extent necessary for shipping and handling. Match-mark sections for re-assembly and coordinated installation.
- B. Shop fabricate ductwork of gages and reinforcement complying with applicable SMACNA standard.
- C. Fabricate duct fittings to match adjoining ducts, and to comply with duct requirements as applicable to fittings. Except as otherwise indicated, fabricate elbows with inside radius equal to associated duct width. Limit angular tapers to 30 degrees for contracting tapers and 20 degrees for expanding tapers.
- D. Fabricate ductwork with accessories installed during fabrication to the greatest extent possible. Refer to Division 15 section "Duct Accessories" for accessory requirements.
- E. Fabricate ductwork with duct liner in each section of duct where indicated. Fabricate ductwork large enough to accept liner of thickness indicated and to maintain inside dimensions shown on contract drawings. Laminate liner to internal surfaces of duct in accordance with instructions by manufacturers of lining and adhesive, and fasten with mechanical fasteners.
- F. Provide lining in all ductwork that is conveying below ambient temperature air and is not insulated. Provide lining in supply air and return air ductwork from air handling unit to 20 feet away from the unit. Provide lining in ductwork as indicated on drawings.

2.05 FACTORY FABRICATED DUCTWORK

- A. General: At Installer's option, provide factory fabricated spiral, round or oval duct and fittings, in lieu of shop fabricated duct and fittings.
- B. Gauge: Tables 3-2 and 3-3 SMACNA "HVAC Duct Construction Standards." No standing rib shall be allowed.
- C. Oval Elbows: 3 gore 90 degree and 2 gore 45 degree with machine formed seam.
- D. Round Elbows: one piece construction for 90 degree and 45 degree elbows 14" and smaller. Provide 5 gore 90 degree and 3 gore 45 degree construction for larger diameter with machine formed seam joint.
- E. Divided flow fittings: 90 degree tees, constructed with saddle tap spot welded and bonded to duct fitting body.

- F. Manufacturer: subject to compliance with requirement, provide factory fabricated ductwork of one of the following:
1. United Sheet Metal Div., United McGill Corp.
 2. Semco

PART 3 - EXECUTION

3.01 INSTALLATION OF DUCTWORK

- A. General: Assemble and install ductwork in accordance with recognized industry practices which will achieve air tight (5% leakage) and noiseless (no objectionable noise) systems, capable of performing each indicated service. Install each run with minimum of joints. Align ductwork accurately at connections, within 1/8" misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable ties, braces, hangers and anchors of type which will hold ducts true-to-shape and to prevent buckling.
- B. Duct Sizing: Duct sizes indicated on drawings are inside dimensions.
- C. Flexible Duct: Flexible duct may be used for connecting room diffuser to sheet metal duct and/or ceiling terminal box only. Extend flexible duct completely and limit lengths to five feet (5'), or as indicated on Drawings. Support according to SMACNA.
- D. Seal ductwork to seal class as prescribed in SMACNA "HVAC Duct Construction Standards" for the static pressure classes indicated, unless otherwise recommended.
- E. Complete fabrication of work at project as necessary to match shop fabricated work and accommodate installation requirements.
- F. Locate ductwork runs, except as otherwise indicated, vertically and horizontally and avoid diagonal runs wherever possible. Locate runs as indicated by diagrams, details and notations or, if not otherwise indicated, run ductwork in shortest route which does not obstruct usable space or block access for servicing building and its equipment. Hold ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building. Limit clearance to 1/2" where furring is shown for enclosure or concealment of ducts, but allow for insulation thickness, if any. Where possible, locate insulated ductwork for 1" clearance outside of insulation. Wherever possible in finished and occupied spaces, conceal ductwork from view, by locating in mechanical shafts, hollow wall construction or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as specifically shown. Coordinate layout with suspended ceiling and lighting layouts and similar finished work.

- G. Electrical equipment spaces: Do not run ductwork through transformer vaults and their electrical equipment spaces and enclosures.
- H. Boiler Rooms: Do not run ductwork through boiler rooms unless protected per NFPA requirements.
- I. Where ducts pass through interior partitions and exterior walls, conceal space between construction opening and duct or duct-plus insulation with sheet metal flanges of same gage as duct. Overlap opening on four sides by at least 1-1/2".
- J. Coordinate duct installations with installation of accessories, dampers, coil frames, equipment, controls and other associated work of ductwork system.
- K. Support ductwork in manner complying with appropriate SMACNA standard.

3.02 INSTALLATION OF WOODSHOP EXHAUST (N/A)

3.03 APPLICATION OF LINER IN RECTANGULAR DUCTSS

- A. Adhere a single layer of indicated thickness of duct liner with at least 90 percent adhesive coverage at liner contact surface area. Attaining indicated thickness with multiple layers of duct liner is prohibited.
- B. Apply adhesive to transverse edges of liner facing upstream that do not receive metal nosing.
- C. Butt transverse joints without gaps and coat joint with adhesive.
- D. Fold and compress liner in corners of rectangular ducts or cut and fit to ensure butted-edge overlapping.
- E. Do not apply liner in rectangular ducts with longitudinal joints, except at corners of ducts, unless duct size and standard liner product dimensions make longitudinal joints necessary.
- F. Apply adhesive coating on longitudinal seams in ducts with air velocity of 2500 fpm (12.7 m/s).
- G. Secure liner with mechanical fasteners 4 inches (100 mm) from corners and at intervals not exceeding 12 inches (300 mm) transversely; at 3 inches (75 mm) from transverse joints and at intervals not exceeding 18 inches (450 mm) longitudinally.
- H. Secure transversely oriented liner edges facing the airstream with metal nosing's that have either channel or "Z" profiles or are integrally formed from duct wall. Fabricate edge facings at the following locations:
 - 1. Fan discharges.
 - 2. Intervals of lined duct preceding unlined duct.

3. Upstream edges of transverse joints in ducts where air velocities are greater than 2500 fpm (12.7 m/s) or where indicated.
- I. Terminate inner ducts with buildouts attached to fire-damper sleeves, dampers, turning vane assemblies, or other devices. Fabricated buildouts (metal hat sections) or other buildout means are optional; when used; secure buildouts to duct walls with bolts, screws, rivets, or welds.

3.04 CLEANING AND PROTECTION

- A. Clean ductwork internally, unit-by-unit as it is installed, of dust and debris. Clean external surfaces of foreign substances which might cause corrosive deterioration of metal or, where ductwork is to be painted, might interfere with painting or cause paint deterioration.
- B. Strip protective paper from stainless ductwork surfaces, and repair finish wherever it has been damaged.
- C. Temporary closure - at ends of ducts which are not connected to equipment or air distribution devices at time of ductwork installation, provide temporary closure of polyethylene film or other covering which will prevent entrance of dust and debris until time connections are to be completed.

3.04 BALANCING

- A. Refer to Division 15 Section 15990 "Testing, Adjusting and Balancing" for air distribution balancing of ductwork. Seal any leaks in ductwork that become apparent in balancing process.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15893 - DUCT ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

- A. Extent of duct accessories work is indicated on drawings and in schedules, and by requirements of this section.
- B. Types of duct accessories required for project include the following:
 - 1. Fire and smoke dampers(in compliance with NFPA80-STD for opening protectives)
 - 2. Access doors
 - 3. Turning vanes
 - 4. Manual Dampers
 - a. Butterfly manual dampers
 - b. Opposed-blade manual dampers
 - 5. Intake/Exhaust dampers
 - 6. Flexible connections

1.02 SUBMITTALS

- A. Product data - submit manufacturer's specifications for each type of duct accessory, including dimensions, capacities, and materials of construction, and installation instructions.
- B. Shop drawings - submit assembly type shop drawings for each type of duct accessory showing interfacing requirements with ductwork, and method of fastening or support.
- C. Maintenance data - submit manufacturer's maintenance data including parts lists for each type of duct accessory, include this data in Maintenance Manual.

1.03 QUALITY ASSURANCE

- A. SMACNA compliance - comply with applicable portions of Sheet Metal and Air Conditioning Contractor's National Association (SMACNA) high pressure and low pressure duct construction standards.
- B. Industry standards - comply with American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (ASHRAE) recommendations pertaining to construction of duct accessories, except as otherwise indicated.
- C. UL compliance - construct, test and label fire dampers in accordance with Underwriters Laboratories (UL) Standard 555 "Fire Dampers and Ceiling Dampers".

- D. NFPA compliance - comply with applicable provisions of ANSI/NFPA 90A "Air Conditioning and Ventilating Systems", pertaining to installation of duct accessories.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver components with factory installed packing and protective containers.
- B. Handle components carefully to prevent damage to components and finish. Do not install damaged components; replace with new.
- C. Protect components from weather, dirt, construction traffic and debris, etc.

PART 2 - PRODUCTS

2.01 FIRE AND SMOKE DAMPERS

- A. Standards, Fire and Smoke Dampers: Conform to the requirements of NFPA 90A and UL listed, labeled and rated 1-1/2 hours, and in compliance with NFPA80-STD for opening protectives. Provide fusible links 165 degrees F., vibration proof and secured with clinched "S" hooks or stainless steel bolts and lock nuts.
- B. Smoke Dampers: Conform to UL, fit with control shafts for operation by electric or pneumatic motors. Provide a 165 degrees F thermal link.
- C. Access Doors: Provide adjacent to all fire and smoke dampers.
- D. Manufacturer: Subject to compliance with requirements, provide products by one of the following.
 - 1. Ruskin Mfg. Co.
 - 2. Controlled Air, Inc.

2.02 ACCESS DOORS

- A. Standard: Conform to SMACNA.
- B. Location: Provide access doors in casings, plenums and ducts where shown on Drawings and where specified for ready access to operating parts including fire dampers, smoke dampers, valves, and concealed coils.
- C. Pressure Classification: Construct and install access doors in accordance with SMACNA Standards to suit the static pressure classifications and the locations where installed.
- D. Access Doors in Ducts: Provide and size doors as follows.
 - 1. Minimum 24-inch by 24-inch clear opening.
 - 2. When field conditions require an access opening smaller than 16-inch by 12-inch, provide a 24-inch long removable

section of casing or duct, secured with quick acting locking devices, 6 inches on centers, to permit ready access without dismantling other equipment.

- E. Door Requirements: Provide doors in casings and duct as follows.
 - 1. Arrange doors so that system air pressure will assist closure and prevent opening when the system is in operation.
 - 2. Coordinate doors and equipment to provide unrestricted passage through clear door opening, without removal of any equipment.
 - 3. Where pressure regulating dampers are installed in ducts or plenums, provide access doors with a clear wire glass observation port, 6-inch by 6-inch minimum size. Anchor port with structural metal frame, resilient gaskets and stainless steel bolts.
- F. Manufacturer: Subject to compliance with requirements, provide products by one of the following manufacturers.
 - 1. Ruskin Mfg. Co.
 - 2. Flexmaster USA, Inc.
 - 3. Ductmate Ind., Inc.
 - 4. United McGill Corp.

2.03 TURNING VANES

- A. Acoustic Turning Vanes: Construct of airfoil shaped aluminum extrusions with perforated faces and fiberglass fill.
- B. Manufacturer: Subject to compliance with requirements, provide products by one of the following manufacturers.
 - 1. Air Filter Corp.
 - 2. Anemostat Products Div., Dynamics Corp. of America.
 - 3. Duro-Dyne Corp.
 - 4. United McGill Corp.

2.04 MANUAL DAMPERS

- A. Provide dampers of single blade (butterfly) type, constructed in accordance with SMACNA Duct Standards.
- B. Provide dampers of multiple, opposed-blade type, constructed in accordance with SMACNA Duct Standards.
- C. Bearings: Two piece molded synthetic.
- D. Axles: 1/2" plated steel hew.
- E. Control Shaft: 1/2" diameter.
- F. Finish: Mill.

- G. Manufacturer: Subject to compliance with requirements, provide products by one of the following manufacturers.
1. Ruskin Mfg. Co.
 2. Controlled Air, Inc.
 3. United McGill Corp.

2.05 INTAKE OR EXHAUST DAMPERS

- A. General: Provide low leakage, airfoil dampers; opposed blade arrangement; AMCA rated 6 CFM/sq. ft. at 4" w.g.
- B. Construction
1. Frame: 6063T5 extruded aluminum hat channel 0.125 wall thickness 5" x 1" (5" x 1/2" top and bottom 12" high or less).
 2. Blades: 6" wide 6063T5 heavy gage extruded aluminum airfoil shape with extruded metal (aluminum) jam seals.
 3. Linkage: Concealed.
 4. Operators: Control operators specified under "Controls" Section, and is work of Division 15.
- C. Manufacturer: Subject to compliance with requirements, provide products by one of the following manufacturers.
1. Construction Specialties, Inc.
 2. Ruskin Mfg. Co.
 3. Arrow United Industries, Inc.

2.06 FLEXIBLE CONNECTIONS

- A. Fans: Provide flexible connections between fans and ducts or casings where indicated on the Drawings or required to accommodate expansion and vibration.
- B. Material: Construct connections of cotton duck, minimum 20 ounces per square yard.
- C. Elevated Temperature: For temperatures in excess of 100 degrees F., and corrosive, acid alkali or garage exhausts use close woven glass cloth, double neoprene coated, minimum 28 ounces per square yard.
- D. Length: Limit flexible connections to 4-inch active length in the direction of airflow.
- E. Standard: Construct in accordance with SMACNA Standards.
- F. Attachment: Attach to fans, casings and ductwork as specified by manufacturer.
- G. Manufacturer: Subject to compliance with requirements, provide products by one of the following manufacturers.
1. Vent Fabrics, Inc. or equal.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine areas and conditions under which duct accessories will be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install duct accessories in accordance with manufacturer's installation instructions, with applicable portions of details of construction as shown in SMACNA standards, and in accordance with recognized industry practices to ensure that products serve intended function.
- B. Install turning vanes in square or rectangular 90 degree elbows in supply and exhaust air systems, and elsewhere as indicated.
- C. Install access doors to open against system air pressure, with latches operable from either side, except outside only where duct is too small for person to enter.
- D. Coordinate with other work, including ductwork, as necessary to interface installation of duct accessories properly with other work.
- E. Field quality control - operate installed duct accessories to demonstrate compliance with requirements. Test for air leakage while system is operating. Repair or replace faulty accessories, as required to obtain proper operation and leakproof performance.

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 drawings.
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 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. S1.4 Specification For Sound Level Meters
 - b. S1.11 Specification 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 15995 MECHANICAL SYSTEMS COMMISSIONING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The purpose of this section is to specify Division 15 responsibilities in the commissioning process.
- B. The systems to be commissioned are listed in Section 01810 Commissioning.
- C. Commissioning requires the participation of Division 15 to ensure that all systems are operating in a manner consistent with the Contract Documents. The general commissioning requirements and coordination are detailed in Division 17. Division 15 shall be familiar with all parts of Division 17 and the commissioning plan issued by the CA and shall execute all commissioning responsibilities assigned to them in the Contract Documents.

1.02 RESPONSIBILITIES

- A. Mechanical, Controls and TAB Contractors. The commissioning responsibilities applicable to each of the mechanical, controls and TAB contractors of Division 15 are as follows (all references apply to commissioned equipment only):
 - 1. Construction and Acceptance Phases
 - a. Include and itemize the cost of commissioning in the contract price.
 - b. In each purchase order or subcontract written, include requirements for submittal data, commissioning documentation, O&M data and training.
 - c. Attend a commissioning scoping meeting and other meetings necessary to facilitate the Cx process.
 - d. Contractors shall provide the CA with normal cut sheets and shop drawing submittals of commissioned equipment.
 - e. Provide additional requested documentation, prior to normal O&M manual submittals, to the CA for development of start-up and functional testing procedures.
 - 1. Typically this will include detailed manufacturer installation and start-up, operating, troubleshooting and maintenance procedures, full details of any owner-contracted tests, fan and pump curves, full factory testing reports, if any, and full warranty information, including all responsibilities of the Owner to keep the warranty in force clearly identified. In addition, the installation, start-up and

checkout materials that are actually shipped inside the equipment and the actual field checkout sheet forms to be used by the factory or field technicians shall be submitted to the Commissioning Agent.

2. The Commissioning Agent may request further documentation necessary for the commissioning process.
 3. This data request may be made prior to normal submittals.
- f. Provide a copy of the O&M manuals and submittals of commissioned equipment, through normal channels, to the CA for review and approval.
 - g. Contractors shall assist (along with the design engineers) in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.
 - h. Provide limited assistance to the CA in preparing the specific functional performance test procedures. Subs shall review test procedures to ensure feasibility, safety and equipment protection and provide necessary written alarm limits to be used during the tests.
 - i. Develop a full start-up and initial checkout plan using manufacturer's start-up procedures and the construction checklists from the CA for all commissioned equipment. Submit to CA for review and approval prior to startup. Refer to Section 01810 Commissioning for further details on start-up plan preparation.
 - j. During the startup and initial checkout process, execute the mechanical-related portions of the construction checklists for all commissioned equipment.
 - k. Perform and clearly document all completed startup and system operational checkout procedures, providing a copy to the CA.
 - l. Address current A/E punch list items before functional testing. Air and water TAB shall be completed with discrepancies and problems remedied before functional testing of the respective air- or water-related systems.
 - m. Provide skilled technicians to execute starting of equipment and to execute the functional performance tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.

- n. Provide skilled technicians to perform functional performance testing under the direction of the CA for specified equipment in Section 01810. Assist the CA in interpreting the monitoring data, as necessary.
- o. Correct deficiencies (differences between specified and observed performance) as interpreted by the CA, OR and A/E and retest the equipment.
- p. Prepare O&M manuals according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.
- q. During construction, maintain as-built red-line drawings for all drawings and final CAD as-builts for contractor-generated coordination drawings. Update after completion of commissioning (excluding deferred testing).
- r. Provide training of the Owner's operating staff using expert qualified personnel, as specified.
- s. Coordinate with equipment manufacturers to determine specific requirements to maintain the validity of the warranty.

2. Warranty Period

- a. Execute seasonal or deferred functional performance testing, witnessed by the CA, according to the specifications.
- b. Correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

B. Mechanical Contractor. The responsibilities of the HVAC mechanical contractor, during construction and acceptance phases in addition to those listed in (A) are:

- 1. Provide startup for all HVAC equipment, except for the building automation control system.
- 2. Assist and cooperate with the TAB contractor and CA by:
 - a. Putting all HVAC equipment and systems into operation and continuing the operation during each working day of TAB and commissioning, as required.
 - b. Including cost of sheaves and belts that may be required by TAB.
 - c. Providing test holes in ducts and plenums where directed by TAB to allow air measurements and air balancing. Providing an approved plug.
 - d. Providing temperature and pressure taps according to the Construction Documents for TAB and commissioning testing.

3. Install a P/T plug at each water sensor, which is an input point to the control system.
 4. List and clearly identify on the as-built drawings the locations of all airflow stations.
 5. Prepare a preliminary schedule for Division 15 pipe and duct system testing, flushing and cleaning, equipment start-up and TAB start and completion for use by the CA. Update the schedule as appropriate.
 6. Notify the OR or CA depending on protocol, when pipe and duct system testing, flushing, cleaning, startup of each piece of equipment and TAB will occur. Be responsible to notify the OR or CA, ahead of time, when commissioning activities not yet performed or not yet scheduled will delay construction. Be proactive in seeing that commissioning processes are executed and that the CA has the scheduling information needed to efficiently execute the commissioning process.
- C. Temperature Controls Contractor. The commissioning responsibilities of the Temperature Controls Contractor, during construction and acceptance phases in addition to those listed in (A) are:
1. Sequences of Operation Submittals. The Temperature Controls Contractor's submittals of control drawings shall include complete detailed sequences of operation for each piece of equipment, regardless of the completeness and clarity of the sequences in the specifications. They shall include:
 - a. An overview narrative of the system (1 or 2 paragraphs) generally describing its purpose, components and function.
 - b. All interactions and interlocks with other systems.
 - c. Detailed delineation of control between any packaged controls and the building automation system, listing what points the BAS monitors only and what BAS points are control points and are adjustable.
 - d. Written sequences of control for packaged controlled equipment. (Equipment manufacturers' stock sequences may be included, but will generally require additional narrative).
 - e. Start-up sequences.
 - f. Warm-up mode sequences.
 - g. Normal operating mode sequences.
 - h. Unoccupied mode sequences.
 - i. Shutdown sequences.
 - j. Capacity control sequences and equipment staging.

- k. Temperature and pressure control: setbacks, setups, resets, etc.
- l. Detailed sequences for all control strategies, e.g., economizer control, optimum start/stop, staging, optimization, demand limiting, etc.
- m. Effects of power or equipment failure with all standby component functions.
- n. Sequences for all alarms and emergency shut downs.
- o. Seasonal operational differences and recommendations.
- p. Initial and recommended values for all adjustable settings, setpoints and parameters that are typically set or adjusted by operating staff; and any other control settings or fixed values, delays, etc. that will be useful during testing and operating the equipment.
- q. Schedules, if known.
- r. To facilitate referencing in testing procedures, all sequences shall be written in small statements, each with a number for reference. For a given system, numbers will not repeat for different sequence sections, unless the sections are numbered.

2. Control Drawings Submittal

- a. The control drawings shall have a key to all abbreviations.
- b. The control drawings shall contain graphic schematic depictions of the systems and each component.
- c. The schematics will include the system and component layout of any equipment that the control system monitors, enables or controls, even if the equipment is primarily controlled by packaged or integral controls.
- d. Provide a full points list with at least the following included for each point:
 - 1. Controlled system
 - 2. Point abbreviation
 - 3. Point description
 - 4. Display unit
 - 5. Control point or setpoint (Yes / No)
 - 6. Monitoring point (Yes / No)
 - 7. Intermediate point (Yes / No)
 - 8. Calculated point (Yes / No)
 - a. Key:
 - b. Point Description: DB temp, airflow, etc.
 - c. Control or Setpoint: Point that control equipment and can have its setpoint changed (OSA, SAT, etc.)

- d. Intermediate Point: Point whose value is used to make a calculation which then controls equipment (space temperatures that are averaged to a virtual point to control reset).
- e. Monitoring Point: Point that does not control or contribute to the control of equipment, but is used for operation, maintenance, or performance verification.
- f. Calculated Point: "Virtual" point generated from calculations of other point values.

The Temperature Controls Contractor shall keep the CA informed of all changes to this list during programming and setup.

- 3. An updated as-built version of the control drawings and sequences of operation shall be included in the final controls O&M manual submittal.
- 4. Assist and cooperate with the TAB contractor in the following manner:
 - a. Meet with the TAB contractor prior to beginning TAB and review the TAB plan to determine the capabilities of the control system toward completing TAB. Provide the TAB any needed unique instruments for setting terminal unit boxes and instruct TAB in their use (handheld control system interface for use around the building during TAB, etc.).
 - b. For a given area, have all required construction checklists, calibrations, startup and selected functional tests of the system completed and approved by the CA prior to TAB.
 - c. Provide a qualified technician to operate the controls to assist the TAB contractor in performing TAB, or provide sufficient training for TAB to operate the system without assistance.
- 5. Assist and cooperate with the CA in the following manner:
 - a. Using a skilled technician who is familiar with this building, execute the functional testing of the controls system. Assist in the functional testing of all equipment. Provide two-way radios during the testing.
 - b. Execute all control system trend logs.
- 6. The Temperature Controls Contractor shall prepare a written plan indicating in a step-by-step manner, the procedures that will be followed to test, checkout and adjust the control system prior to functional performance testing, according to the process in Section 01810 Commissioning. At minimum, the plan shall include for each type of equipment controlled by the automatic controls:
 - a. System name.

- b. List of devices.
- c. Step-by-step procedures for testing each controller after installation, including:
 - 1. Process of verifying proper hardware and wiring installation.
 - 2. Process of downloading programs to local controllers and verifying that they are addressed correctly.
 - 3. Process of performing operational checks of each controlled component.
 - 4. Plan and process for calibrating valve and damper actuators and all sensors.
 - 5. A description of the expected field adjustments for transmitters, controllers and control actuators should control responses fall outside of expected values.
- d. A copy of the log and field checkout sheets that will document the process. This log must include a place for initial and final read values during calibration of each point and clearly indicate when a sensor or controller has "passed" and is operating within the contract parameters.
- e. A description of the instrumentation required for testing.
- f. Indicate what tests on what systems should be completed prior to TAB using the control system for TAB work. Coordinate with the CA and TAB contractor for this determination.
- 7. Provide a signed and dated certification to the CA and OR upon completion of the checkout of each controlled device, equipment and system prior to functional testing for each piece of equipment or system, that all system programming is complete as to all respects of the Contract Documents, except functional testing requirements.
- 8. Beyond the control points necessary to execute all documented control sequences, provide monitoring, control and virtual points as specified in Section 15950.
- 9. List and clearly identify on the as-built duct and piping drawings the locations of all static and differential pressure sensors (air, water and building pressure).
- D. TAB Contractor. The duties of the TAB contractor, in addition to those listed in (A) are:
 - 1. Six weeks prior to starting TAB, submit to the OR the qualifications of the site technician for the project, including the name of the contractors and facility managers of recent projects the technician on which was lead. The Owner will approve the site technician's qualifications for this project.

2. Submit the outline of the TAB plan and approach for each system and component to the CA, OR and the Temperature Controls Contractor six weeks prior to starting the TAB. This plan will be developed after the TAB has some familiarity with the control system.
3. The submitted plan will include:
 - a. Certification that the TAB contractor has reviewed the construction documents and the systems with the design engineers and contractors to sufficiently understand the design intent for each system.
 - b. An explanation of the intended use of the building control system. The Temperature Controls Contractor will comment on feasibility of the plan.
 - c. All field checkout sheets and logs to be used that list each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
 - d. Discussion of what notations and markings will be made on the duct and piping drawings during the process.
 - e. Final test report forms to be used.
 - f. Detailed step-by-step procedures for TAB work for each system and issue: terminal flow calibration (for each terminal type), diffuser proportioning, branch / submain proportioning, total flow calculations, rechecking, diversity issues, expected problems and solutions, etc. Criteria for using air flow straighteners or relocating flow stations and sensors will be discussed. Provide the analogous explanations for the water side.
 - g. List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
 - h. Details of how *total* flow will be determined (Air: sum of terminal flows via BAS calibrated readings or via hood readings of all terminals, supply (SA) and return air (RA) pitot traverse, SA or RA flow stations. Water: pump curves, circuit setter, flow station, ultrasonic, etc.).
 - i. The identification and types of measurement instruments to be used and their most recent calibration date.
 - j. Specific procedures that will ensure that both air and water side are operating at the lowest possible pressures and provide methods to verify this.
 - k. Confirmation that TAB understands the outside air ventilation criteria under all conditions.

- l. Details of whether and how minimum outside air cfm will be verified and set, and for what level (total building, zone, etc.).
 - m. Details of how building static and exhaust fan / relief damper capacity will be checked.
 - n. Proposed selection points for sound measurements and sound measurement methods.
 - o. Details of methods for making any specified coil or other system plant capacity measurements.
 - p. Details of any TAB work to be done in phases (by floor, etc.), or of areas to be built out later.
 - q. Details regarding specified deferred or seasonal TAB work.
 - r. Details of any specified false loading of systems to complete TAB work.
 - s. Details of all exhaust fan balancing and capacity verifications, including any required room pressure differentials.
 - t. Details of any required interstitial cavity differential pressure measurements and calculations.
 - u. Plan for hand-written field technician logs of discrepancies, deficient or uncompleted work by others, contract interpretation requests and lists of completed tests (scope and frequency).
 - v. Plan for formal progress reports (scope and frequency).
 - w. Plan for formal deficiency reports (scope, frequency and distribution).
4. A running log of events and issues shall be kept by the TAB field technicians. Submit hand-written reports of discrepancies, deficient or uncompleted work by others, contract interpretation requests and lists of completed tests to the CA and OR at least twice a week.
 5. Communicate in writing to the Temperature Controls Contractor all setpoint and parameter changes made or problems and discrepancies identified during TAB which affect the control system setup and operation.
 6. Provide a draft TAB report within two weeks of completion. A copy will be provided to the CA. The report will contain a full explanation of the methodology, assumptions and the results in a clear format with designations of all uncommon abbreviations and column headings. The report should follow the latest and most rigorous reporting recommendations by AABC, NEBB or ASHRAE Standard 111.
 7. Provide the CA with any requested data, gathered, but not shown on the draft reports.

8. Provide a final TAB report for the CA with details, as in the draft.
 9. Conduct functional performance tests and checks on the original TAB.
- E. Mechanical Designer. Refer to Section 01810 Commissioning for the (reference only) responsibilities of the mechanical designer.

1.03 RELATED WORK

- A. Refer to Section 01810 Commissioning, for a listing of all sections where commissioning requirements are found.
- B. Refer to Section 01810 Commissioning for systems to be commissioned and Section 01810 Commissioning.

PART 2 - PRODUCTS

2.01 TEST EQUIPMENT

- A. Division 15 shall provide all test equipment necessary to fulfill the testing requirements of this Division.
- B. Refer to Section 01810 Commissioning for additional Division 15 requirements.

PART 3 - EXECUTION

3.01 SUBMITTALS

- A. Division 15 shall provide submittal documentation relative to commissioning as required in this Section Part 1, Section 01300 and Section 01810 Commissioning.

3.02 STARTUP

- A. The HVAC mechanical and Temperature Controls Contractors shall follow the start-up and initial checkout procedures listed in the Responsibilities list in this section and in 17100. Division 15 has start-up responsibility and is required to complete systems and sub-systems so they are fully functional, meeting the design objectives of the Contract Documents. The commissioning procedures and functional testing do not relieve or lessen this responsibility or shift that responsibility partially to the commissioning agent or Owner.
- B. Functional testing is intended to begin upon completion of a system. Functional testing may proceed prior to the completion of systems or sub-systems at the discretion of the CA and OR. Beginning system testing before full completion, does not relieve the Contractor from fully completing the system, including all construction checklists as soon as possible.

3.03 TAB

- A. Refer to the TAB responsibilities in Part 1.2 above.

3.04 FUNCTIONAL PERFORMANCE TESTS

- A. Refer to Section 01810 Commissioning for a list of systems to be commissioned and for a description of the process.

3.05 TESTING DOCUMENTATION, NON-CONFORMANCE AND APPROVALS

- A. Refer to Section 01810 Commissioning for specific details on non-conformance issues relating to construction checklists and tests.
- B. Refer to Section 01810 Commissioning for issues relating to functional performance tests.

3.06 OPERATION AND MAINTENANCE (O&M) MANUALS

- A. The following O&M manual requirements do not replace O&M manual documentation requirements elsewhere in these specifications.
- B. Division 15 shall compile and prepare documentation for all equipment and systems covered in Division 15 and deliver this documentation to the GC for inclusion in the O&M manuals, according to this section and Section 01730, prior to the training of owner personnel.
- C. The CA shall receive a copy of the O&M manuals for review.
- D. Special Control System O&M Manual Requirements. In addition to documentation that may be specified elsewhere, the Temperature Controls Contractor shall compile and organize at minimum the following data on the control system in labeled 3-ring binders with indexed tabs.
 - 1. Four copies of the controls training manuals in a separate manual from the O&M manuals.
 - 2. Operation and Maintenance Manuals containing:
 - a. Specific instructions on how to perform and apply all functions, features, modes, etc. mentioned in the controls training sections of this specification and other features of this system. These instructions shall be step-by-step. Indexes and clear tables of contents shall be included. The detailed technical manual for programming and customizing control loops and algorithms shall be included.
 - b. Full as-built set of control drawings (refer to Submittal section above for details).
 - c. Full as-built sequence of operations for each piece of equipment.
 - d. Full points list. In addition to the updated points list required in the original submittals (Part 1 of this section), a listing of all rooms shall be provided with the following information for each room:
 - 1. Floor
 - 2. Room number
 - 3. Room name
 - 4. Air handler unit ID
 - 5. Reference drawing number
 - 6. Air terminal unit tag ID

- 7. Heating and/or cooling valve tag ID
 - 8. Minimum cfm
 - 9. Maximum cfm
- e. Full print out of all schedules and set points after testing and acceptance of the system.
- f. Full as-built print out of software program.
- g. Electronic copy on disk of the entire program for this facility.
- h. Marking of all system sensors and thermostats on the as-built floor plan and mechanical drawings with their control system designations.
- i. Maintenance instructions, including sensor calibration requirements and methods by sensor type, etc.
- j. Control equipment component submittals, parts lists, etc.
- k. Warranty requirements.
- l. Copies of all checkout tests and calibrations performed by the Contractor (not commissioning tests).
- 3. The manual shall be organized and subdivided with permanently labeled tabs for each of the following data in the given order:
 - a. Sequences of operation
 - b. Control drawings
 - c. Points lists
 - d. Controller / module data
 - e. Thermostats and timers
 - f. Sensors and DP switches
 - g. Valves and valve actuators
 - h. Dampers and damper actuators
 - i. Program setups (software program printouts)
- 4. Field checkout sheets and trend logs should be provided to the CA for inclusion in the Commissioning Record Book.
- E. Special TAB Documentation Requirements. The TAB will compile and submit the following with other documentation that may be specified elsewhere in the *Specifications*.
 - 1. Final report containing an explanation of the methodology, assumptions, test conditions and the results in a clear format with designations of all uncommon abbreviations and column headings.
 - 2. The TAB shall mark on the drawings where all traverse and other critical measurements were taken and cross reference the location in the TAB report.
- F. Review and Approvals. Review of the commissioning related sections of the O&M manuals shall be made by the A/E and by the CA. Refer to Section 01810 Commissioning, Part 3.8 for details.

3.07 TRAINING OF OWNER PERSONNEL

- A. The GC shall be responsible for training coordination and scheduling and ultimately to ensure that training is completed. Refer to Section 01810 Commissioning for additional details.
- B. The CA shall be responsible for overseeing and approving the content and adequacy of the training of Owner personnel for commissioned equipment. Refer to Section 01810 Commissioning for additional details.
- C. Mechanical Contractor. The mechanical contractor shall have the following training responsibilities:
 - 1. Provide the CA with a training plan two weeks before the planned training according to the outline described in Section 01810 Commissioning.
 - 2. Provide designated Owner personnel with comprehensive orientation and training in the understanding of the systems and the operation and maintenance of each piece of HVAC equipment including, but not limited to, pumps, boilers, furnaces, chillers, heat rejection equipment, air conditioning units, air handling units, fans, terminal units, controls and water treatment systems, etc.
 - 3. Training shall normally start with classroom sessions followed by hands-on training on each piece of equipment, which shall illustrate the various modes of operation, including startup, shutdown, fire/smoke alarm, power failure, etc.
 - 4. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.
 - 5. The appropriate trade or manufacturer's representative shall provide the instructions on each major piece of equipment. This person may be the start-up technician for the piece of equipment, the installing contractor or manufacturer's representative. Practical building operating expertise as well as in-depth knowledge of all modes of operation of the specific piece of equipment are required. More than one party may be required to execute the training.
 - 6. The Temperature Controls Contractor shall attend sessions other than the controls training, as requested, to discuss the interaction of the controls system as it relates to the equipment being discussed.
 - 7. The training sessions shall follow the outline in the Table of Contents of the operation and maintenance manual and illustrate whenever possible the use of the O&M manuals for reference.
 - 8. Training shall include:
 - a. Use of the printed installation, operation and maintenance instruction material included in the O&M manuals.

- b. A review of the written O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training shall include start-up, operation in all modes possible, shut-down, seasonal changeover and any emergency procedures.
 - c. Discussion of relevant health and safety issues and concerns.
 - d. Discussion of warranties and guarantees.
 - e. Common troubleshooting problems and solutions.
 - f. Explanatory information included in the O&M manuals and the location of all plans and manuals in the facility.
 - g. Discussion of any peculiarities of equipment installation or operation.
 - h. The format and training agenda in *The HVAC Commissioning Process, ASHRAE Guideline 1-1989R*, 1996 is recommended.
 - i. Classroom sessions shall include the use of overhead projections, slides, video/audio-taped material as might be appropriate.
- 9. Hands-on training shall include start-up, operation in all modes possible, including manual, shut-down and any emergency procedures and preventative maintenance for all pieces of equipment.
 - 10. The mechanical contractor shall fully explain and demonstrate the operation, function and overrides of any local packaged controls, not *controlled* by the central control system.
 - 11. Training shall occur after functional testing is complete, unless approved otherwise by the Project Manager.
 - 12. Duration of Training. The mechanical contractor shall provide training on each piece of equipment according to the following schedule.

<u>Hours</u>	<u>System</u>
<u>8</u>	Chillers and System
<u>8</u>	Boilers and System
<u>3</u>	Piping Systems
<u>4</u>	Chemical Treatment
<u>12</u>	Air Handler Units
<u>1</u>	Spot Unit Heaters
<u>2</u>	Air Terminal Units
<u>1</u>	Central Exhaust Systems
<u>2</u>	Supplementary Fans
<u>2</u>	Pumps
<u>16</u>	Controls System
<u>16</u>	Control system Follow-up
<u>4</u>	Humidifiers
<u>4</u>	Water Heaters

D. Temperature Controls Contractor. The Temperature Controls Contractor shall have the following training responsibilities:

1. Provide the CA with a training plan four weeks before the planned training according to the outline described in Section 01810 Commissioning, Part 3.9.
2. The Temperature Controls Contractor shall provide designated Owner personnel training on the control system in this facility. The intent is to clearly and completely instruct the Owner on all the capabilities of the control system.
3. Training manuals. The standard operating manual for the system and any special training manuals will be provided for each trainee, with three extra copies left for the O&M manuals. In addition, copies of the system technical manual will be demonstrated during training and three copies submitted with the O&M manuals. Manuals shall include detailed description of the subject matter for each session. The manuals will cover all control sequences and have a definitions section that fully describes all relevant words used in the manuals *and* in all software displays. Manuals will be approved by the CA. Copies of audiovisuals shall be delivered to the Owner.
4. The trainings will be tailored to the needs and skill-level of the trainees.
5. The trainers will be knowledgeable on the system and its use in buildings. For the on-site sessions, the most qualified trainer(s) will be used. The Owner shall approve the instructor prior to scheduling the training.
6. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.
7. The Temperature Controls Contractor shall attend sessions other than the controls training, as requested, to discuss the interaction of the controls system as it relates to the equipment being discussed.
8. There shall be three training sessions:
 1. Training I. Control System. This training may be held on-site or in the supplier's facility. If held off-site, the training may occur prior to final completion of the system installation. Upon completion, each student, using appropriate documentation, should be able to perform elementary operations and describe general hardware architecture and functionality of the system.
 2. Training II. Building Systems. The second session shall be held on-site and will consist of actual hands-on training after the completion of system

commissioning. The session shall include instruction on:

- a. Specific hardware configuration of installed systems in this building and specific instruction for operating the installed system, including HVAC systems, lighting controls and any interface with security and communication systems.
 - b. Security levels, alarms, system start-up, shut-down, power outage and restart routines, changing set points and alarms and other typical changed parameters, overrides, freeze protection, manual operation of equipment, optional control strategies that can be considered, energy savings strategies and set points that if changed will adversely affect energy consumption, energy accounting, procedures for obtaining vendor assistance, etc.
 - c. All trending and monitoring features (values, change of state, totalization, etc.), including setting up, executing, downloading, viewing both tabular and graphically and printing trends. Trainees will actually set-up trends in the presence of the trainer.
 - d. Every screen shall be completely discussed, allowing time for questions.
 - e. Use of keypad or plug-in laptop computer at the zone level.
 - f. Use of remote access to the system via phone lines or networks.
 1. Setting up and changing an air terminal unit controller.
 2. Graphics generation
 3. Point database entry and modifications
 4. Understanding DDC field panel operating programming (when applicable)
3. Training III. The third training (Follow-up Training) will be conducted on-site six months after occupancy. The session will be structured to address specific topics that trainees need to discuss and to answer questions concerning operation of the system.

E. TAB The TAB contractor shall have the following training responsibilities:

1. TAB shall meet for 2 hours with facility staff after completion of TAB and instruct them on the following:
 - a. Go over the final TAB report, explaining the layout and meanings of each data type.

- b. Discuss any outstanding deficient items in control, ducting or design that may affect the proper delivery of air or water.
- c. Identify and discuss any terminal units, duct runs, diffusers, coils, fans and pumps that are close to or are not meeting their design capacity.
- d. Discuss any temporary settings and steps to finalize them for any areas that are not finished.
- e. Other salient information that may be useful for facility operations, relative to TAB.

3.08 DEFERRED TESTING

- A. Refer to Section 01810 Commissioning, Part 3.10 for requirements of deferred testing.

3.09 WRITTEN WORK PRODUCTS

- A. Written work products of Contractors will consist of the start-up and initial checkout plan described in Section 01810 Commissioning and the filled out start-up, initial checkout and construction checklists.

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.

Replace any existing requirements elsewhere in this Division.		
<u>Function / Mode</u>	<u>Test Method</u> Manual, Monitoring, Either or Both ³	<u>Required Seasonal Test</u> 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	

<u>Function / Mode</u>	<u>Test Method</u> Manual, Monitoring, Either or Both ³	<u>Required Seasonal Test</u> 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		

¹Cooling 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.

²Seasonal test not required if seasonal conditions can be adequately simulated.

³Refer 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.

<u>Function / Mode</u>	<u>Test Method</u> Manual, Monitoring, Either or Both	<u>Required Seasonal Test¹</u>
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 that it is associated with.	Manual	
In addition to, or as part of (1) above, the following modes or tests are required:		
2. <u>Primary Side.</u> Lead/lag staging of boilers, optimization, capacity modulation, and primary HW supply pumps.	Both	Heating
3. <u>Secondary Side.</u> 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

<u>Function / Mode</u>	<u>Test Method</u> Manual, Monitoring, Either or Both	<u>Required Seasonal Test</u> 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		

¹Cooling 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.

<u>Function / Mode</u>	<u>Test Method</u> 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	

<u>Function / Mode</u>	<u>Test Method</u> 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

- 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.

<u>Function / Mode</u>	<u>Test Method</u> Manual, Monitoring, Either or Both ¹	<u>Required Seasonal Test</u>
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 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	

¹Refer to Special Procedures

F. Special Procedures (other equipment to test with, etc.; reference to function ID) None

G. Required Monitoring

- 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.

<u>Function / Mode</u>	<u>Test Method</u> Manual, Monitoring, Either or Both	<u>Required Seasonal Test</u>
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 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.

<u>Function / Mode</u>	<u>Test Method</u> Manual, Monitoring , Either or Both ³	<u>Required Seasonal Test</u> ¹
General 1. Test each sequence in the sequence of operations, and other significant modes and sequences not mentioned; including startup, warmup, shutdown, unoccupied & 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	

<u>Function / Mode</u>	<u>Test Method</u> Manual, Monitoring , Either or Both ³	<u>Required Seasonal Test</u> 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:

¹Cooling 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.

²Seasonal test not required if seasonal conditions can be adequately simulated.

³Refer 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
 - 1. TAB water-side Construction Checklist ID 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.

<u>Test or Check</u>	<u>Test Method</u>	<u>Required Seasonal Test³</u>
<p>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 <u>use</u> the same test instruments as used in the original TAB work.</p> <p>A failure¹ of more than 10% of the selected items of a given system² 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.</p> <p>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.</p>	Demonstration	
<p>2. Verify that final settings of all valves, splitters, dampers and other adjustment devices have been permanently marked by the TAB Contractor.</p>	Demonstration	
<p>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.</p>	Demonstration	
<p>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.</p>	Demonstration	

¹Failure 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)

²Examples 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.

³Cooling 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 15A - PLUMBING

SECTION 15011A - PLUMBING GENERAL PROVISIONS

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

- A. This Section contains General Provisions related specifically to the Plumbing Work.
 - 1. Quality Assurance
 - 2. Protection
 - 3. Coordination and Sequencing
 - 4. General Completion
 - 5. Painting and Finishing
 - 6. Excavation for Plumbing Work
 - 7. Concrete for Plumbing Work
- B. Drawings and General Provisions of Contract, including General and Supplementary Conditions, apply to this section.

1.02 GENERAL

- A. This Contractor, as well as sub-contractors for his work, must carefully read the "Instructions to Bidders" and study the plans and specifications.
 - 1. It is the intention of these specifications to provide for the furnishing and installing of the plumbing equipment complete as shown and specified. Any work or changes which may be evidently necessary to complete the installation shall be furnished by the Contractor as being included in this Contract.
 - 2. During the course of the work, should any ambiguities or discrepancies be found in the specifications to which the Contractor has failed to call attention to before submission of his bid, then the Engineer shall interpret the intent of the 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 instructions nor the specifications shall take precedence, one over the other, and it is further stipulated that the Engineer may interpret or construe the specifications of the work, and of that question the Engineer shall be the sole judge.
 - 3. Where no specified kind of quality of material is given, a first class standard article as approved by the Engineer shall be furnished. The specifications do not undertake to illustrate or set forth every item necessary for the work.

4. Small details not usually shown or specified but necessary for its proper installation and finishing shall be included in the Contractor's estimate, the same as if hereby specified or shown.

1.03 QUALITY ASSURANCE

A. Laws, Permits, Inspections.

1. Comply with the latest revisions of New York State Uniform Fire Protection and Construction Code, International Plumbing Code, 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, as referenced in NYCRR.
4. Comply with N.Y. State Education Department Manual of Planning Standards.
5. Comply to requirements of drawings and specifications that are in excess of governing codes.
6. Comply with section 1621 of the New York State Building Code for seismic requirements.
7. Do not install work as specified or shown if in conflict with governing code. Notify Engineer and request direction.
8. Pay all Inspection and Permit fees.
9. 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. AGA - American Gas Association
2. AIA - American Institute of Architects
3. AMCA - American Moving and Conditioning Association, Inc.
4. ANSI - American National Standards Institute.
5. ASHRAE - American Society of Heating, Refrigeration and Air Conditioning Engineers
6. ASME - American Society of Mechanical Engineers
7. ASTM - American Society of Testing Materials
8. AWS - American Welding Society Code
9. AWWA - American Water Works Association
10. CS - Commercial Standard
11. FS - Federal Specification
12. IEEE - Institute of Electric and Electronics Engineers
13. NEC - National Electric Code
14. NEMA - National Electrical Manufacturer's Association
15. NFPA - National Fire Protection Association
16. NYBFU - New York Board of Fire Underwriters
17. NYCRR - Codes, Rule and Regulations of the State of New York.
18. NSF - National Sanitation Foundation
19. PDI - Plumbing and Drainage Institute.

- 20. SMACNA - Sheet Metal and Air Conditioning Contractors National Association
 - 21. USASI - United States of America Standards
 - 22. 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.

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 firewalls, 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.

1.05 COORDINATION AND SEQUENCING

- A. Coordinate plumbing equipment installation with other building components.
- B. Arrange for chases, slots and openings in building structure during progress of construction, to allow for plumbing installations.

- C. Coordinate the installation of required supporting devices 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 plumbing 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 are specified in Section 15052A "Access to Plumbing Work."
- 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. Fire Suppression.
 - 3. Steam and condensate piping.
 - 4. Hot water supply and hot water return piping.
 - 5. Drain Pipes and Vents
 - 6. Ductwork
 - 7. HVAC Piping
 - 8. Domestic Water Piping
 - 9. Electrical Conduit

1.06 GENERAL COMPLETION

- A. Oiling Equipment.
 - 1. Lubricate equipment and motors in accordance with manufacturer's requirements. Provide lubrication chart in frame mount where directed by Owner.
- 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 all equipment installed under this contract.

- C. Provide Operation and Maintenance manuals in accordance with the Requirements of Division 1 "Contract Closeout" Section.

1.07 PAINTING AND FINISHING

- A. Refer to Division 9, Section "Painting" 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 CUTTING AND PATCHING - SEE SPECIFICATION SECTION 15060A

1.09 EXCAVATION FOR PLUMBING WORK

- A. Description of Work: Types of excavation for plumbing related work specified in this section include:
 - 1. Underground plumbing utilities and services.
 - 2. Underground tanks and equipment enclosures.
 - 3. Interior and Exterior water distribution systems to 5 feet outside of the building or where indicated on the plans.
 - 4. Interior and Exterior sanitary and storm drainage systems to 5 feet outside of the building or where indicated on the plans.
- 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 plumbing work on frozen excavation bases or sub bases.

1.10 CONCRETE FOR PLUMBING WORK

- A. Types of concrete for plumbing related work specified in this section include:
 - 1. Lean concrete backfill to support plumbing work.

2. Encasement of mechanical work.
3. Plumbing equipment foundations and housekeeping pads.
4. Inertia bases for isolation of plumbing work.
5. Rough grouting in and around plumbing work.
6. Patching concrete cuts to accommodate plumbing work.
7. Thrust block.

1.11 REBATES

- A. The Division 15A 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

2.01 BACKFILL MATERIALS

- A. Sub base Material (Bedding): Graded mixture of gravel, sand crushed stone or crushed slag.
- B. Backfill Material: Soil material free of large stones, shale, wood and similar material.

2.02 CONCRETE

- A. Concrete installed by this division shall comply with Division 3 Specifications for Concrete.

PART 3 - EXECUTION

3.01 EXCAVATION - GENERAL

- A. Do not excavate for plumbing 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 clearance.

- C. 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.
- D. Depth for sub base support: For large piping (6" pipe size and larger), tanks, and where indicated for other plumbing work, excavate for installation of sub base material in depth indicated or, if not otherwise indicated, 6" below bottom of work to be supported.
- E. 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 sub base material compacted as directed, to indicate excavation depth.
- F. 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 it in lawful manner.

3.02 WATER CONTROL

- A. Maintain dry excavations for plumbing work, by removing water. Protect excavations from inflow of surface water. Pump minor inflow of ground water from excavations, protect excavations from major inflow of ground water, by installing temporary sheeting and waterproofing. Provide adequate barriers which will protect other excavations and below grade property from being damage by water, sediment or erosion from or through plumbing work excavations.

3.03 BACKFILLING

- A. Do not backfill until installed plumbing work has been tested and accepted.
- B. Install drainage fill where indicated, and tamp to uniform firm density.
- C. Backfill with finely graded sub base material to 6" above wrapped, coated and plastic piping and tanks, or as shown on drawings 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 side of plumbing 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 cohesion less soil.
 - 2. Paved areas and roadways: 90% for cohesive soils, 95% for cohesion less 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 backfill and 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 minimum 4 inches higher or as shown on drawings, and 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

- A. Concrete installed by this division shall comply with Division 3 Specifications for Concrete.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15013A - CODES, STANDARDS, AND PERMITS

1.01 GENERAL

- A. 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.
- B. 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.
- C. Certain standard and staple materials are described by reference to standard specifications. These standards are as follows:
- | | |
|--------|-------------------------------------------------------------------------------|
| AGA | American Gas Association |
| 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 |
| CGA | Compressed Gas Association |
| 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
National Association |
| USASI | United States of America Standards Institute |
| UL | Underwriters' Laboratories |
| | New York State Uniformed Fire Prevention and
Building Code |
| IPC | International Plumbing Code |
- D. All electric facilities shall receive the Underwriters label and be installed in accordance with the latest issue of the National Electric Code requirements.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15014A - SCHEDULE OF EQUIVALENCY

1.01 GENERAL

- A. Wherever a brand name or manufacturer is named in this specification, it indicates the standard of quality or purpose desired. Where one certain kind, type, brand, or manufacturer of materials is named, it shall be regarded as the standard 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 other kind, type, brand, or manufacturer of material other than named in the specifications, he shall submit a list, with his bid, stating what material, equipment, or method is offered as equal and how it affects the contract price.
- B. The equivalency of such items is to be judged by the Engineer whenever offered by bidders as equivalent to the Base Bid items and so reported to the Owner for his ultimate decision.
- C. The following manufacturers are approved equivalents for those listed in the specifications:
1. Insulation:

Johns-Mansville Corporation
Owens-Corning Fiberglass Corporation
Knauf
Certainteed
 2. Drains, Cleanouts, Flashing Sleeves, Wall Hydrants, Water Hammer Arrestors, Interceptors, and Fixture Supports

Zurn Manufacturing Company
Josam Manufacturing Company
Jay R. Smith Company
 3. Plumbing Fixtures

Zurn
American Standard
Crane Company
 4. Fixture Trim

American Standard
Chicago Faucet Company
T & S Brass and Bronze Works
 5. Flush Valves

Zurn
Sloan Valve Company
American Standard

6. Toilet Seats

American Standard
Olsonite
C.F. Church Company

7. Access Doors

Karp Associates, Inc.
Zurn Manufacturing Company
Wilcox Steel Company

8. Valves

Jenkins Brothers
Lukenheimer Company
Walworth Company

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15015A - MAINTENANCE INSTRUCTIONS

PART 1 - GENERAL

1.01 GENERAL

- A. In addition to the requirements outlined in the "General Provisions", the following information shall be incorporated:
1. Manufacturer's plumbing equipment parts list of all functional components including control diagrams and wiring diagrams of controllers.
 2. Step by step instructions for each system including preparation for starting, operation, and shutdown. Provide full maintenance manual describing procedures for each new piece of equipment. In addition, provide a video showing / describing step by step instructions for maintenance of each new piece of equipment.
 3. Twelve-month maintenance schedule for each type of equipment.
 4. Possible breakdowns and repairs for each type of equipment.
 5. List of nearest local suppliers for all equipment.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15050A - PLUMBING BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

- A. This Section includes the following basic plumbing materials and methods to complement other Division 15A Sections.
 - 1. Submittals.
 - 2. Pipe joining materials and installation instructions common to piping systems.
 - 3. Piping specialties: Escutcheons, dielectric fittings, sleeves and seals.
 - 4. Non-shrink grout for equipment installations.
 - 5. Drip pans.
 - 6. Pipe supports: Hangers, clamps, support spacing, building attachments, shields and saddles, flashing, miscellaneous materials, and anchors.
 - 7. Field fabricated metal and wood equipment supports.
 - 8. Firestopping.
- 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.
- B. NSF 372 and ANSI 61

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. Reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling-mounted items.

1.04 STANDARDS FOR MATERIALS AND WORKMANSHIP

- A. All materials and workmanship shall, at a minimum be in accordance 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.
- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.
- C. All fittings NSF 372 ANSI 61.

2.02 PIPE JOINING MATERIALS

- A. Refer to individual piping system specification Sections in Division 15A 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. 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.

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, threaded or grooved 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: 5 percent 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 VALVES

- A. Refer to individual piping system specifications section in Division 15A for special valves not listed below.
- B. General

1. Valves shall be installed only in upright vertical or horizontal positions unless specifically otherwise required by the drawings.
2. All valves shall be installed in accessible locations to facilitate easy removal for repair or replacement. Where not possible provide access doors. Refer to 15052A.
3. All gate and globe valves shall be designed for repacking when wide open under pressure.
4. Domestic water system valves 3/4" and smaller and all balancing valves shall be globe type.
5. All valves of the same type shall be the products of a single manufacturer and shall comply with ANSI B31.1.
6. All valves for domestic water use shall be no lead type in accordance with NSF-372 ANSI 61.

C. GATE VALVES

1. Cold, hot, and hot water return, 2" and smaller: Ball type solder end connections. Jenkins, Nibco, or equal Type B. 3" and larger gate valve: Jenkins, Nibco, or equal Type 1, Class "A", Style 3.

D. GLOBE VALVES

1. 3" or smaller: Jenkins, Nibco, or equal. Over 3": Jenkins, Nibco, or equal, Type 1 with cast iron body and bronze trim.

E. CHECK VALVES

1. 3" and smaller: Jenkins, Nibco, or equal, Type IV, Class "A".

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 HORIZONTAL PIPING HANGERS AND SUPPORTS

- A. General: Except as otherwise indicated, provide factory fabricated horizontal piping hangers and supports. Hangers and supports shall be in complete conformance with Chapter 3 of the New York State Plumbing Code. 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.
- 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.

2.08 VERTICAL PIPING CLAMPS

- A. Two bolt riser clamp.
1. Material: Carbon steel copper plated for copper piping.
 2. Finish: Black or copper plated.

2.09 HANGER ROD AND SPACING

ROD SIZE AND SPACING SCHEDULE

<u>Pipe Size</u>	<u>Maximum Spacing</u>		<u>Rod Size</u>
	Steel	Copper	
1/2 to 1	6 ft.	6 ft.	3/8"
1-1/4 to 1-1/2	6 ft.	6 ft.	3/8"
2	12 ft.	10 ft.	3/8"
2-1/2 - 3-1/2	12 ft.	10 ft.	1/2"
4 - 5	12 ft.	10 ft.	5/8"
6	12 ft.	10 ft.	3/4"
8 - 12	12 ft.		7/8"
14 - 16	12 ft.		1"

Note: Cast Iron - support at every hub or coupling 5 ft. maximum spacing.

2.10 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.
- B. On Structural Steel:

1. For pipes 2" and smaller: C clamps with lock nuts similar to Anvil figure 86.
 2. For pipes 5" and larger: Use beam clamps similar to Anvil figure 228 or 292.
- C. On New Masonry:
1. Use concrete inserts similar to Anvil figure 281.
- D. On Existing Concrete:
1. Use expansion case similar to Anvil figure 117.
- E. On Wood:
1. Use coach screw rods Anvil figure 142. Ceiling flanges Anvil figure 153, or fabricated angle clips. Use wood drive screws or lag bolts as fasteners.

2.11 SHIELDS AND SADDLES

- A. General: For insulated piping.
- B. Shields: 16-gauge galvanized metal.
- C. Protection saddles:
1. Hardwood block
 2. Steel saddle Anvil 160 series

2.12 FLASHING MATERIALS

- A. General: Provide flashings for each penetration of plumbing 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. Coated 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.

2.13 MISCELLANEOUS MATERIALS

- A. Metal framing: Provide products complying with NEMA.
- 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 American Welding Society (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.

2.14 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: Install piping as described below, except where system Sections specify otherwise. Individual piping system specification Sections in Division 15A 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. Pitch piping at low points. Provide Manual Blowdown for maintenance.
- D. Install piping at indicated slope.
- E. Install components having pressure rating equal to or greater than system operating pressure.
- F. Install piping in concealed interior and exterior locations, except in equipment rooms and service areas.
- G. Install piping free of sags and bends.
- H. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, except where indicated.
- I. 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.

- J. Install piping to allow application of insulation plus 1-inch clearance around insulation.
- K. Locate groups of pipes parallel to each other, spaced to permit valve servicing.
- L. Install fittings for changes in direction and branch connections.
- M. Install couplings according to manufacturer's printed instructions.
- N. 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.
- O. Sleeves are not required for core drilled holes.
- P. Permanent sleeves are not required for holes formed by PE plastic (removable) sleeves.
- Q. Install sleeves for pipes passing through concrete and masonry walls, concrete floor and roof slabs, and where indicated.
- R. 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. CPVC Pipe Sleeves: For pipes smaller than 6 inches.
 - b. Steel Pipe Sleeves: For pipes smaller than 6 inches.
 - c. Steel Sheet-Metal Sleeves: For pipes 6 inches and

- larger, penetrating gypsum-board partitions.
- d. 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.
- e. 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.
- S. 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.
- T. 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.
- U. Below Grade, Exterior Wall, Pipe Penetrations: Install ductile-iron wall penetration system sleeves according to manufacturer's printed installation instructions.
- V. Verify final equipment locations for roughing-in.
- W. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.
- X. 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", "The Soldering of Pipe and Tube".
 - 4. Brazed Joints: Construct joints according to AWS "Brazing Manual", "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.
- Y. Welded Joints: Construct joints according to AWS "Recommended Practices and Procedures for Welding Low Carbon Steel Pipe" using qualified processes and welding operators according to "Quality Assurance" article.
- Z. 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.
- AA. 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): 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.
- 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 ERECTION OF METAL SUPPORTS AND ANCHORAGE

- A. 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".

3.04 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.

3.05 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

3.06 DRIP PANS

- A. Locate drip pans under piping passing over or within 3 feet

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. Provide Leak Detection Alarm Floodmaster RS097. Provide power to unit.

3.07 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.

3.08 INSTALLATION OF HANGERS AND SUPPORTS

- A. General: Install hangers, supports, clamps and attachments to support piping properly from building structure. 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:
 - 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.

3.09 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.

3.10 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.

3.11 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 metal 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.

3.12 FIRE STOPPING

- A. Provide UL listed and tested firestopping material, silicone elastomer specifically formulated for use in horizontal and vertical applications. The material shall possess intumescent characteristics, and upon exposure to heat above 250 degrees F. shall expand to not less than five times its original volume to form a fireproof envelope UL rated for 2- and 3-hours protection, when applied in accordance with the manufacturer's recommendation.
- B. See section 15511 for additional fire stopping requirements.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15052A - ACCESS TO PLUMBING WORK

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

- A. Access doors in walls and ceilings.

1.02 SUBMITTALS

- A. Product data: Submit manufacturer's technical data and installation instructions for each type of access door assembly, including setting drawings, templates, instructions and directions for installation of anchorage devices.

1.03 QUALITY ASSURANCE

- A. Fire resistance ratings: Where fire resistance rating is required for construction penetrated by access units, provide UL listed and labeled units, except for units which are smaller than minimum requirements.

PART 2 - PRODUCTS

2.01 ACCESS DOORS

- A. Where walls and ceilings must be penetrated for access to mechanical work, provide types of access doors indicated. Furnish sizes indicated or, where not otherwise indicated, furnish adequate size for intended and necessary access. Furnish manufacturer's complete units, of type recommended for application in indicated substrate construction, in each case, complete with anchorages and hardware.
- B. Construction: Except as otherwise indicated, fabricate wall/ceiling door units of welded steel construction with welds ground smooth, 16-gauge frames and 14-gauge flush panel doors, 175 degree swing with concealed spring hinges, flush screwdriver-operated cam locks, factory applied rust-inhibitive prime coat paint finish.
- C. Available manufacturers
 - 1. Milcor Div., Inryco Inc.
 - 2. Smith (Jay R.) Mfg. Co.
 - 3. Zurn Industries, Inc.

PART 3 - EXECUTION

3.01 GENERAL

- A. Comply with manufacturer's instructions for installation of access doors.

- B. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.
- C. Adjust hardware and panels after installation for proper operation.
- D. Remove or replace panels or frames which are warped, bowed, or otherwise damaged.
- E. Paint access doors to match surrounding surfaces.
- F. In wet and damp locations provide stainless steel doors.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15057A - PLUMBING IDENTIFICATION SYSTEMS

1.01 GENERAL

- A. Provide labels for all new pipes including hot water, hot water return, cold water, sanitary drain, storm drain, vent, gas and acid waste piping. Install identifying tags on all valves.

PART 2 - PRODUCTS

2.01 EQUIPMENT LABELS

- A. Small: Labels shall be adhesive backed plastic tape with embossed letters in contrasting color. Tape shall be 3/8" wide.
- B. Large: Labels shall be adhesive backed plastic tape with embossed letters in contrasting color.
- C. Make: Seton Name Plate Corporation.

2.02 PIPING MARKERS

- A. Pipe markers shall be snap-on type indicating pipe contents and direction of flow on a color coded background conforming to American National Standards Institute (ANSI) Standard A13.1. Pipe diameter less than 2" and smaller shall be snap-on type. Pipe diameter greater than 2" shall be stick-on type.
 - 1. Hot water - green with white lettering.
 - 2. Cold water - green with white lettering.
 - 3. Sanitary Drain and Vent - green with white lettering.
 - 4. Storm Drain - green with white lettering.
 - 5. Gas - yellow with black lettering.
 - 6. Acid Waste - black with orange lettering.
- B. Make: Seton Name Plate Corporation - Setmark, or equal by Dover, Brady.

2.03 VALVE TAGS

- A. Tags: Tags shall be 1 3/4" x 3 1/2" laminated with two 0.020" thick plastic sheets with matte finish and with a brass eyelet in the corner. Typed information shall include appropriate alphanumeric code (prefixed with the letter "P"), system designation, the fluid in the pipe, and size and function of the valve.
- B. Make: Dover Enterprises, Syracuse, New York or approved equal by Seton Name Plate Company.

3.01 GENERAL INSTALLATION REQUIREMENTS

- A. Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish; including valve tags in finished mechanical spaces, install identification after completion of covering and painting.

3.02 EQUIPMENT

- A. General: Install engraved plastic laminate sign or plastic equipment marker on or near each major item of mechanical equipment and each operational device, as specified herein if not otherwise specified for each item or device. Provide signs for the following general categories of equipment and operational devices:
 - 1. Meters, gauges, thermometers and similar units.
 - 2. Fuel-burning units including water heaters.
 - 3. Pumps and similar motor-driven units.
 - 4. Storage tanks and pressure vessels.
 - 5. Strainers, filters, humidifiers, water treatment systems and similar equipment.
- B. Lettering Size: Minimum 1/4" high lettering for name of unit where viewing distance is less than 2'-0", 1/2" high for distances up to 6'-0", and proportionately larger lettering for greater distances. Provide secondary lettering 2/3 to 3/4 size of principal lettering.
- C. Text of Signs: In addition to name of identified unit, provide lettering to distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

3.03 PIPING

- A. After piping has been painted or insulated, apply pipe labels as specified above.
- B. Space labels on 15' centers in mechanical rooms, space at 25' centers elsewhere and at each side of partitions and interior walls. Also, at each branch and riser take off and adjacent to each valve (except at fixtures and equipment).

3.04 VALVES IDENTIFICATION

- A. General: Provide valve tag on every valve, cock and control device in each piping system; exclude check valves, valves within factory-fabricated equipment units, plumbing fixture faucets, convenience hose bibs, and shut-off valves at plumbing fixtures, and similar rough-in connections of end-use fixtures and units. List each tagged valve in valve schedule for each piping system.
- B. Provide valve tag chart, framed and securely fastened to the wall, using anchors and fasteners, where directed by owner.
- C. Submit list of valve tags, including wording, for approval **BEFORE** ordering.

3.05 ADDITIONAL INFORMATION

- A. For additional information see Specification Section 15050A - Plumbing Basic Materials & Methods.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15060A - CUTTING AND PATCHING

PART 1 - GENERAL

1.01 GENERAL

- A. Each Contractor shall be responsible for his cutting and patching. The Contractor shall also be responsible for all finish patching and painting.
- B. Each Contractor shall replace and patch any surfaces of any structure disturbed by his operations and his work, even if such operations and work are outside the contract limit. Such replacement, repair, and patching shall be with similar material and shall restore surfaces as they exist, or better.
- C. Cut and alter existing materials as required to perform the work. Limit cutting to the smallest amount necessary for proper installation of the work.
- D. Where the removal of existing building components necessitates the addition of patching in new materials, such work shall be executed to insure the fire resistance rating of the system and visual continuity with adjacent surfaces, whether or not the remedial work is specifically detailed on the drawings.
- E. Perform the removal work with such care as may be required to prevent damage to adjoining construction which is to remain.
- F. Do not disturb any existing structure, piping, apparatus, or other construction which must remain unless expressly required by the contract. Where cutting or removals are required in existing construction, do the work in a manner that will safeguard and not endanger the structure and as approved by the Engineer.
- G. If unforeseen obstructions are encountered, take all precautions necessary to prevent damage and obtain full instructions from the Engineer before proceeding with the work.
- H. Remove from the site all debris and other materials resulting from the alterations and removals, subject to the General Requirements.
- I. Fill all voids and patch existing construction and finishes damaged within area of alteration work unless otherwise indicated. Provide new materials to match existing corresponding items as closely as practicable.
- J. Any pipe penetrations through fire rated areas shall be accomplished using Hilti fire barrier products in sheets, strips, or caulk using ASTM, UL, and FM standards.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15180A - PLUMBING INSULATION

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

- A. Extent of plumbing insulation work required by this section is indicated on Drawings and by requirements of this section.
- B. Work includes thermal insulation for the following:
 - 1. Domestic cold water piping.
 - 2. Domestic hot water and hot water circulating piping.
 - 3. Domestic tempered water piping
 - 4. Storm water drainage piping.
 - 5. Roof drain bodies.

1.02 QUALITY ASSURANCE

- A. Fire Hazard Classification: In accordance with ASTM E-84, NFPA 255 and UL 723, for insulation systems, including insulation, adhesives and coverings, not to exceed the following:
 - 1. Flame spread 25.
 - 2. Fuel contributed 50.
 - 3. Smoke developed 50.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturers specification sheets, installation instructions, fire and smoke ratings. Submit schedule matching insulation type to mechanical systems and equipment.

1.04 INSULATION THICKNESS

- A. Insulate domestic hot water supply, tempered water, and hot water recirculating piping with insulation thickness of fiberglass piping insulation as shown below, ASTM C 547 Class 1, with All Service Jacket.
- B. Insulate domestic cold water Branches and Mains with insulation thickness as shown below of fiberglass piping insulation, ASTM C 547 Class 1.
- C. Insulate storm water piping and roof drains with 1" insulation thickness of fiberglass insulation, ASTM C 547 Class 1.
- D. Insulate condensate drain to HVAC units with 1" fiberglass insulation.

**To Meet or Exceed Energy Conservation Construction Code of the State of
New York**

THICKNESS TABLE

	<u>IPS 1-1/4" & Below</u>	<u>IPS 1-1/2" to 4"</u>	<u>IPS Above 4"</u>
Hot Water	1"	1-1/2"	1-1/2"
Hot Water Ret.	1"	1-1/2"	N/A
Cold Water	1"	1"	1"
Storm	1"	1"	1"

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver insulation, coverings, cements, adhesives and coatings to site in containers with manufacturer's stamp or label affixed showing fire hazard indexes of products.
- B. Protect insulation against dirt, water and chemical and mechanical damage. Do not install damaged or wet installation, remove from project site.

PART 2 - PRODUCTS

2.01 DOMESTIC COLD WATER, HOT WATER, TEMPERED, AND HOT WATER CIRCULATING
PIPING

- A. Scope: Insulate all mains, branches, fittings, flanges and valves including those in ceiling spaces, pipe chases or spaces. Terminate insulation at the fixture supply stops. Insulate equipment connections to the equipment stop.
- B. Type:
 - 1. Pre-formed sectional type nominal 3# density glass fiber in standard 3' long sections tightly butted together. K factor (Thermal conductivity) of 0.23 at 75° mean. Make: Mansville, Owens-Corning, or Knauf.
- C. Finish:
 - 1. Main mechanical room piping and exposed risers and runouts in finished rooms: Factory-applied All Service Jacket with self-sealing laps.
 - 2. Valves, fittings and flanges: Equal thickness of fiberglass insulation with Zeston fittings covers or equal by Ham-Fab, Mansville.

2.02 STORM WATER PIPING - ABOVE GROUND

- A. Scope: Insulate all horizontal piping above ground including underside of roof drain bodies and all fittings.
 - B. Type: Pipe insulation shall be preformed sectional type nominal 3 pound density glass fiber in standard 3 foot long sections with a K factor of 0.23 at 75 mean and factory applied All Service
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Jackets. Seal joints with 3" All Service Jacket.

- C. Fittings & Drain Bodies: Insulate all fittings, hubs, flange and Drain bodies with fiberglass pre-moulded fitting insulation or with 1" resilient fiberglass blanket. (3/4) pcf density minimum) wrapped around the fitting or drain body, tied down with wire or jute. Compress blanket 50% in installation. Coat each fitting or drain body with two 1/8" coats of vapor barrier mastic reinforced with glass fabric extending 2" onto adjacent pipes.

2.03 METAL JACKETED PIPE INSULATION

- A. Scope: Pipe exposed to weather or physical abuse shall be insulated with .016" aluminum jacket over fiberglass insulation of the specified thickness. Sections shall be made in 36" lengths.
- B. Fire and smoke Hazard Classification shall not exceed flame spread index of 25 or less and smoke developed index of 50 or less as tested by ASTM E-84, NFPA 255 or UL 723.
- C. Manville Micro-Lok 650ML.

2.04 EQUIPMENT INSULATION MATERIALS

- A. Rigid Fiberglass Equipment Insulation: ASTM C 612, Class 2.
- B. Flexible Fiberglass Equipment Insulation: ASTM C 553, Type I, Class B-4.
- C. Jacketing Material for Equipment Insulation: Provide pre-sized glass cloth jacketing material, not less than 7.8 ounces per square yard, or metal jacket at Installer's option, except as otherwise indicated.
- D. Equipment Insulation Compounds: Provide adhesives, cements, sealers, mastics and protective finishes as recommended by insulation manufacturer for applications indicated.
- E. Equipment Insulation Accessories: Provide staples, bands, wire, wire netting, tape, corner angles, anchors and stud pins as recommended by insulation manufacturer for applications indicated.

PART 3 - EXECUTION

3.01 INSTALLATION - GENERAL

- A. Apply insulation in accordance with the Schedule of Insulation on the Contract Specifications.
- B. Use only insulation and finish materials including adhesives, cements, and mastics which conform to the requirements of all local codes and ordinances.
- C. Fire resistant adhesive is highly flammable in liquid form. Eliminate welding, smoking, or other sources of ignition during application.

- D. Apply insulation after all piping pressure tests, as described in Piping Installation Procedure, have been completed.
- E. Clean surfaces of loose scale, dirt, oil, and other foreign matter and dry prior to insulating.
 - 1. Detail for space @ blowdown
 - 2. Detail for pipe @ insulation penetrating wall.
- F. Apply insulation to completely cover piping surface. Do not insulate over weld certification stamps.
- G. "Exposed" as used in this section means exposed to view. "Concealed" means concealed to view such as in furred chases or above suspended ceiling. Penthouse and equipment rooms are considered exposed locations.
- H. Fill surface imperfections in the insulation such as chipped edges, small joints or cracks, and small voids or holes with appropriate insulation material and smooth with skim coat of hydraulic-setting insulating cement. Vapor barriers shall be continuous and unbroken at hanger installations.
- I. Fit inside diameter of insulation sections or segments to outside curvature of pipe or previous insulation layer.
- J. Where standard insulation shapes are not available, cut, score, or miter segments of appropriate block to fit contour of pipe. Stagger joints of adjoining segments. Fit insulation carefully and secure with No. 20 gage galvanized annealed steel wire. Finish with a smoothing coat of hydraulic-setting insulating cement.
- K. Insulate valves, strainer, fittings, and flanges with identical material, density, thickness, and surface finish as the piping insulation. All edges shall be filled with filler and finished with a smoothing coat of hydraulic-setting insulating cement.
- L. Insulate the entire surface of fittings and strainers. Insulate valves up to and including bonnets, unless authorized otherwise by Project Engineer. Do not cover removable valve bonnets.
- M. Insulate strainers to permit removal of the basket without disturbing the insulation of the strainer body. Strainer covers shall be molded and taped to upper section of insulation.
- N. Bevel the ends of pipe insulation adjacent to flanges to permit bolt removal. Provide a collar of sectional block insulation over the flanges and extend a minimum of 2 inches over the adjacent pipe insulation. Fasten with staples to permit easy removal. Prior to applying collar fill annular spaces with loose insulation.
- O. Insulate all piping through sleeves.
- P. Where pipelines pass through masonry walls or floors, completely fill the space between outside of pipe or insulation and the

inside of the sleeve or framed opening with fibrous mineral wool or fiberglass pipe insulation.

- Q. When it is unavoidable and hangers for cold lines must be installed directly on the pipe, insulate and finish the entire hanger and the rod for a length of not less than 12 inches above the pipe.
- R. Apply insulation to completely cover metal surfaces.
- S. Cut, score, or miter insulation to fit shape and contour of equipment. Where surfaces are flat, cylindrical, or regularly curved, use premolded blocks or segments.
- T. Where required, provide permanently fastened angles or plates to support insulation.
- U. Apply insulation on cover plates, heads and access openings as separate sections, with insulation cut back for access to boltheads and other fasteners.
- V. Do not insulate over nameplates. Cut back insulation and line the insulation edges with 24 gage galvanized steel.
- W. Surface Finish.
 - 1. Apply surface finish to present a tight, smooth appearance.
 - 2. Do not apply sealant or cement until all previous applications of cement and adhesives have thoroughly dried.
 - 3. Extend surface finish to protect all insulation surfaces. Prevent raw edges or ends of insulation from being exposed.

3.02 INSTALLATION OF PIPING INSULATION

- A. Apply to pipes with side and end joints butted tightly per manufacturer's directions.
- B. Where joints in insulation occur, and at hangers, take extra precautions to seal the vapor barrier with adhesive BF 95-44 so that no moisture penetration will occur. Notify Engineer when insulation is complete so he may make inspection before walls are closed in or ceilings applied.
- C. Where fiberglass insulation is exposed in an occupied room, apply pre-sized glass cloth vapor barrier jacket in same manner using same type of adhesive (or use ASI/SSL).
- D. Repair all breaks in the jacket with 4" wide strip of vapor barrier jackets (FRGC or SSL as required) applied smoothly and securely. When applying adhesive at temperature below 75°F, use staples with an additional brush coat of adhesive over the exterior of the staples.
- E. Adhere 4" wide strips of jacket material smoothly and securely over all end joints with vapor barrier adhesive as above to insure a continuous vapor barrier.

- F. Apply insulation on all cold surfaces where vapor barrier jackets are used with a continuous, unbroken vapor seal. Insulate and vapor seal hangers, supports, anchors, etc., that are securely directed to cold surfaces to prevent condensation.

3.03 EQUIPMENT INSULATION

- A. Cold Equipment (Below Ambient Temperature)
 - 1. Application Requirements: Insulate the following cold equipment:
 - a. Domestic Hot water expansion tanks
 - 2. Insulate each item of equipment specified above with fiberglass: 2" thick
- B. Hot Equipment (Above Ambient Temperature)
 - 1. Application Requirements: Insulate the following hot equipment.
 - a. Hot water storage tanks
 - b. Water heaters (not insulated by manufacturer)
 - 2. Insulate each item of equipment specified above with fiberglass: 2" thick.

3.04 SUPPORT OF INSULATED PIPE LINES

- A. Scope: Install inserts at each hanger or support for all water lines for sizes 1-1/2" and up, or 16 gauge electro-galvanized carbon steel shields may be used in lieu of inserts. Install supporting devices on insulated lines with hangers with insulation shields.
- B. Inserts:
 - 1. Inserts between the pipe and pipe hangers shall consist rigid pipe insulation of equal thickness to the adjoining fiberglass insulation and shall be provided with vapor barrier where required.
 - 2. Insulation inserts shall not be less than the following lengths:
 - 1-1/2" to 2-1/2" pipe size, use 6" length
 - 3" to 6" pipe size, use 9" length
- C. Supporting Devices: Use cork stoppers, short lengths of wood dowels or wood blocks of the same thickness as insulation. Curve the support device surfaces to match the curve of the metal shield. Metal shields are provided with the hanger.

3.05 ADHESIVES, MASTIC, AND COATINGS

- A. Apply adhesives, mastic and coatings specified at the
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manufacturer's recommended coverage per gallon.

3.06 EXPOSED RISERS AND RUNOUTS

- A. Finish exposed risers and runouts in occupied rooms with ALL SERVICE JACKET.
- B. Occupied areas mean all areas except ceiling spaces, crawl spaces and closed off pipe spaces or chases.

3.07 EXISTING INSULATION REPAIR

- A. Repair damaged sections of existing mechanical insulation damaged during this construction period. Use insulation of the same thickness as existing insulation. Install new jacket lapping and seal over existing.

3.08 PROTECTION AND REPLACEMENT

- A. Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.
- B. Protection: Insulation installer shall advise Contractor of required protection for insulation work during remainder of construction period, to avoid damage and deterioration.
- C. Surface Finish: No surface finish required.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15411A - PLUMBING DOMESTIC WATER PIPING SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

- A. Extent of domestic water piping systems work is indicated on drawings and schedules, and by requirements of this section.
- B. Applications for domestic water piping systems include the following:
 - 1. Domestic cold water piping.
 - 2. Domestic hot water piping.
 - 3. Domestic recirculating water piping.
 - 4. Water hammer arresters.
 - 5. Valves.
 - 6. Pumps
- C. All domestic water piping systems must comply with the "Lead-Free" Division 15A Specifications. The contractor shall provide the required submittals for all equipment that will be part of the system prior to the equipment installation, and confirm on the jobsite that the equipment adheres to "Lead-Free" regulations.

1.02 SUBMITTALS

- A. Product Data: Submit manufacturer's data for domestic water piping systems, materials and products.
- B. Submittals shall include but not be limited to the following:
 - 1. Valves
 - 2. Water hammer arresters
 - 3. Piping
 - 4. Pumps

1.03 QUALITY ASSURANCE

- A. Plumbing Code: Comply with applicable portions of New York State Uniform Fire Protection and Building Code, Article 9, Plumbing Requirements, State sanitary code, Department of Health, Division Sanitary Engineering, Bureau of Public Water Supply, any local codes or regulations, and the International Plumbing Code and the International Energy Conservation Code.
- B. All piping valves, hydrants, etc. shall comply with all ASME, ANSI, ASTM, AWWA and NFPA regulations that apply to the work.
- C. Meters, backflow preventers, hydrants, etc. shall conform to local utility company regulations, ordinances and laws, and the International Plumbing Code (IPC).
- D. Obtain all necessary approvals, certificates and arrange for all inspections required by local authorities having jurisdictions. Pay all fees.

- E. Perform water sampling upon completion of all piping systems. Samples to be analyzed by a NYS Dept. of Health approved lab for bacteria as well as all other code required chemical / organic analyses. The plumbing contractor will bear all costs associated with the testing procedures / reports. Test reports shall be included as part of the project closeout documents.

PART 2 - PRODUCTS
(All to comply with the 2015 IPC)

2.01 DOMESTIC WATER PIPING

A. Underground Water

1. 3" or larger: Class 52 ductile iron pipe per AWWA C151, with C104 cement lining, and asphaltic coating inside and out. Fittings shall be cast or ductile iron per AWWA C110, with push-on joints with four serrated silicon bronze wedges at each joint for electrical continuity. Underground type plastic line marker: Provide standard permanent bright colored, continuous-printed plastic tape, intended for direct burial service, not less than 6"wide X 4 mils thick, with lettering "WATER SERVICE".

2. 2" and smaller: Type 'K' copper soldered or brazed.

B. Domestic hot water, cold water and tempered water.

1. Type "L" copper, ASTM B88.
2. Make: Anaconda, or equal by Muller, Revere.
3. Fittings shall be wrought or cast solder type pressure fittings.
4. Chrome plated sponge cleanable brass, sch. 40 for exposed piping.

2.02 BALL VALVES

- A. Description: Bronze body, ball valve with 600 PSI W.O.G. min. rating, teflon seats, stainless ball, blow-out proof stem, viton-o-ring sealed union, removable operating handle and solder ends. Bronze materials to be "no lead" type, in conformance with the latest edition of NSF 61. ANSI372

2.03 INTERIOR HOSE BIBBS

- A. 'No-Lead', Anti-siphon vacuum breaker wall faucet enclosed in a flush mounting wall box, ¾" male hose outlet, loose key opens box and faucet operator, chrome plated casting.
- B. Make:
- C. Josam or equivalent. Where indicated, install on cold water piping.

2.04 EXTERIOR WALL HYDRANTS

- A. 'No lead', Automatic draining, freezeless wall hydrant with an anti-siphon vacuum breaker enclosed in a flush mounting wall box. Cast bronze, ¾" male hose outlet, non-freeze, "water" on cover, key handle, proper length galvanized wall sleeve, vacuum breaker, wall clamp, chrome finish.
- B. Where indicated, install on cold water piping.

2.05 SWING CHECK VALVES

- A. General: Construct pressure-containing parts as follows:
 - 1. Bronze valves, 125 or 150 psi: ANSI/ASTM B 62. Bronze materials to be "no lead" type, in conformance with the latest edition of NSF 61. ANSI 372.
- B. Construct valves with disk seating angle 40° to 45° unless composition disc is specified. Provide stop plug as renewable stop for disc hanger. Construct disc and hanger as separate parts, with disc free to rotate. Support hanger pins on both ends by removable side plugs.
- C. Soldered ends 2" and smaller: Class 125, bronze body, screwed cap, horizontal swing, bronze disc.
- D. Flanged ends 2 1/2" and larger: Class 125, iron body bronze mounted, bolted cap, horizontal swing, cast iron disc.
- E. Manufacturers:
 - 1. Jenkins Bros., A Corp.
 - 2. Kennedy Valve.
 - 3. Lunkenheimer.
 - 4. Stockham Valves and Fittings, Inc.

2.06 SPECIAL VALVES

- A. Balance valve:
 - 1. Bronze/Brass Ball valve with pressure readout ports, calibrated nameplate and memory stop. Bronze materials to be "no lead" type, in conformance with the latest edition of NSF 61.
 - 2. Make: Bell & Gossett model CB, Watts
- B. Trap Primer Valve:
 - 1. 'No lead', Automatic, large port openings, activates on 10 psig pressure drop at 30-250 psig. Water release is factory set. Chrome plated finish.

2.07 THERMOMETERS AND GAGES

- A. Water Pressure Gages: 0-150 psi range, aluminum or brass 4-1/2" case, 1/4" NPT connection. Glass enclosed dial with 1/4" ball valve. 1 percent accuracy, ANSI B40.1, Grade A.
- B. Glass Thermometers
 - 1. General: Die cast aluminum, baked epoxy enamel finish, glass front, 9" long, adjustable joint, locking device. 1 percent accuracy, shock mounted. Copper plated steel or brass stem. Alcohol based thermometers to be used.
 - 2. Range:
 - a. Hot water: 30 to 240°F, 2°F divisions.
 - b. Cold water: 30 to 180°F, 2°F divisions.
 - 3. Thermometer wells: No Lead, Brass or stainless steel, 2" extension for insulated piping. Cap nut with chain fastened to thermometer well.

2.08 PLUMBING INSULATION

- A. General: Comply with Division 15A Section "15180A, Plumbing Insulation".

2.09 UNIONS

- A. Description: "No lead" Cast Brass with Solder Ends. Working pressure: 200 PSI W.O.G.
- B. Make: Nibco, or equal by Mueller, Revere.

2.10 SOLDER AND FLUX

- A. Solder shall be in solid wire form of Type II 95-5 tin antimony solder conforming to ASTM B-32, Grade 5A. Flux shall be a zinc chloride or a mixture of zinc and ammonium chlorides. Solders containing lead shall not be used. 96.5 - 3.5 and 95-5 tin/silver solders may be used.

2.11 SHOCK ARRESTER

- A. Construction:
 - 1. Type 1: Stainless steel body with stainless steel bellows, an air or argon gas cushion and with or without hydraulic displacement fluid.
 - 2. Type 2: "No lead" Hard drawn copper body, polypropylene piston with EPDM O ring seal and brass NPT threaded connection.
 - 3. Contractor may use either Type 1 or Type 2.
- B. Code Compliance: Shock absorbers shall comply with the following codes:
 - 1. P.D.I. - WH201 latest issue.
 - 2. ASSE 1010 latest issue.
- C. Make:
 - 1. Type 1: J.R.Smith 5000 Series.

2. Type 2: Watts LF15M2 -DR Series

PART 3 - EXECUTION

3.01 INSTALLATION OF DOMESTIC WATER PIPING MATERIALS AND PRODUCTS

- A. General: Install the following in accordance with Division 15A Section "Basic Materials and Methods".
1. Identification.
 2. Piping specialties.
 3. Supports, anchors and seals.

3.02 INSTALLATION OF PIPE, TUBE AND FITTINGS

- A. General: Install in accordance with Division 15A Section "Basic materials and Methods".
- B. Install in accordance with recognized industry practices, which will achieve permanently leak proof piping systems. Install each run with minimum joints and couplings. Reduce sizes (where indicated) by use of reducing fittings. Align piping accurately at connections, within 1/16" misalignment tolerance. Comply with ANSI B31 Code for pressure piping.
- C. Hose faucets at low points. Cap with hose caps.
- D. Carry headers for groups of fixtures full size through their length.
- E. Swing joints as follows:
1. From water mains to risers.
 2. From riser to branch connections to fixtures.
 3. From riser to mains.

3.03 INSTALLATION OF SHOCK ARRESTORS

- A. General: Upright position, locations and sizes indicated in accordance with PDI Standard WH-201.

3.04 INSTALLATION OF STRAINERS

- A. General: Install full size of pipeline, in accordance with manufacturers installation instructions. Install pipe nipple and shutoff valve in strainer blow down connection, full size of connection, except for strainers 2" and smaller installed ahead of control valves feeding individual terminals. Where indicated, provide drain line from shutoff valve to plumbing drain, full size of blow down connection.
1. Locate plate-type strainer in supply line ahead of the water meter.

3.05 INSTALLATION OF VALVES

- A. General: Install where required for proper operation of piping and equipment, including all branch lines to isolate sections of piping. Locate to be accessible and separate support can be provided.
- B. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward for

- horizontal plane unless unavoidable.
- C. Insulation: Where insulation is indicated, install extended stem valves, arranged in proper manner to receive insulation.
 - D. Drain Valves: Each plumbing equipment item. Located to completely drain equipment for service or repair. Base of each riser, base of each rise or drop in piping system, at all low points, and where indicated or required to completely drain system. Provide hose caps on hose bibbs.
 - E. Check Valves: Horizontal position with hinge pin horizontally perpendicular to center line of pipe. Install for proper direction of flow.

3.06 INSTALLATION OF SPECIAL VALVES

- A. Balance Valves: Each hot water recirculating loop, and where indicated.
- B. Trap Primer Valves: Install in upright, vertical position in a convenient cold water line where indicated for floor drain primer supply.

3.07 INSTALLATION OF THERMOMETERS AND GAGES

- A. General: Install in accordance with manufacturer's instructions.
- B. Locations: Where indicated on Drawings.

3.08 INSTALLATION OF PLUMBING INSULATION

- A. Install in accordance with Division 15A Section "Plumbing Insulation".

3.09 EQUIPMENT CONNECTIONS

- A. Piping Runouts to Fixtures: Hot and cold water runouts of sizes indicated, no smaller than required by the Plumbing Code.
- B. Mechanical Equipment Connections:
 - 1. Connect hot and cold water piping system to plumbing equipment as indicated.
 - 2. Comply with equipment manufacturer's installation instructions.
 - 3. Provide shutoff valve and union for each connection.
 - 4. Provide drain valve on drain connection.
 - 5. Exposed piping shall be sch. 40 chrome plated brass, sponge cleanable surface.

3.10 WALL HYDRANT AND HOSE BIBB INSTALLATION

- A. Wall hydrant: Install approximately 24" above finished grade or as noted on the plans. Install a stop and drain valve on each wall hydrant branch.
- B. Hose Bibbs for toilet and finished rooms: In rooms where shown with lavatories, install approximately 18" above finished floor under lavatory where indicated. Elsewhere, install 36" above the finished floor where shown. Install stop on branch. Hose bibbs to be furnished with loose key handles.

3.11 WATER SYSTEM DISINFECTION

- A. Scope: All newly installed lines carrying potable water and parts of existing systems which have been altered, extended or repaired prior to use.
- B. Before any use of system is made for domestic purposes, disinfect by one of the following methods as specified in the New York State Uniform Fire Prevention and Building Code. All water samples are to be sent to / tested by a New York State Department of Health approved lab for bacteria analysis. All test results shall be sent to the engineer for review prior to placing the systems in service.
 - 1. The system shall be filled with a water solution containing 50 parts per million of available chlorine and allowed to stand for 24 hours before flushing and returning to service.
 - 2. The system shall be filled with a water solution containing 200 parts per million of available chlorine and allowed to stand one hour before flushing and returning to service.
 - 3. For a potable water storage tank, where it is not practicable to disinfect by the foregoing methods, the entire interior of the tank shall be swabbed with a water solution containing 200 parts per million of available chlorine and allowed to stand for two hours before flushing and returning to service.
- C. Contractor shall provide test kit for residual chlorine.
- D. After contact period flush system with clear water until system tests no more than 0.2 PPM residual chlorine.

3.12 DOMESTIC WATER SYSTEM TEST

- A. Test in accordance with the requirements of Section 15985A - "Plumbing, Testing, Adjusting and Balancing."

3.13 SPARE PARTS

- A. Furnish to Owner, with receipt, one valve key for each key operated hydrant, bib, or faucet installed.

3.14 ADD LEAD TESTING NOTE

- A. Following the completion of the P.C. work scope, the owner shall have the water conditions tested for lead containments by a third-party testing firm to regulation 67.4 of the Department of Health regulations as part of Section 1417 of the Federal Safe Water Act to determine "Lead-Free" compliance and SED guidelines of less than 15 parts per billion.
- B. If the system does not comply with Sub-Part Regulation 67.4 of the DOH Section 1417 of the Federal Safe Water Act, the P.C. shall provide replacements at no additional cost, to then repeat the installation and testing requirements. The P.C. shall absorb the fee for the first lead testing procedure as well as the following confirmation procedures at no additional cost to the owner.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15412A - PLUMBING SANITARY PIPING SYSTEMS

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 soil, waste and vent piping system work, is indicated on drawings and schedules, and by requirements of this section.
- B. Applications for soil, waste and vent piping systems include the following:
 - 1. Above ground soil, waste and vent piping within buildings including soil stacks, vent stacks, horizontal branches, traps, and connections to fixtures and drains.
 - 2. Underground building drain piping including mains, branches, traps, connections to fixtures and drains, and connections to stacks, terminating at connection to sanitary sewer, 5'-0" from building wall, or where shown on drawing. Coordinate with site contractor.
- C. Trenching and backfilling is required in conjunction with underground and building drain piping is specified in applicable Division 15A sections, and is included as work of this section.

1.03 QUALITY ASSURANCE

- A. Plumbing code compliance - comply with applicable portions of New York State Uniform Fire Protection and Building Code, especially Article 9, Plumbing Requirements, State Sanitary Code, Department of Health, Division Sanitary Engineering, Bureau of Public Water Supply, any local codes or regulations that apply pertaining to plumbing materials, and the 2015 IPC especially Chapter 7.
- B. ANSI compliance - comply with applicable American National Standards pertaining to products and installation of soil and waste piping systems.
- C. PDI compliance - comply with applicable Plumbing and Drainage Institute Standards pertaining to products and installation of soil and waste piping systems.

1.04 SUBMITTALS

- A. Product data - submit manufacturer's data for soil and waste piping systems materials and products on the following:
 - 1. Pipe and Couplings
 - 2. Clean outs
 - 3. Floor drains
- B. Acceptable Manufacturers

1. Floor Drains
 - a. Jay R. Smith
 - b. Josam
 - c. Zurn
 - d. Watts
2. Couplings for no-hub pipe
 - a. Anaco
 - b. Tyler
3. Soil Pipe
 - a. Eastern Foundry
 - b. Tyler Pipe
 - c. Charlotte Pipe

PART 2 - PRODUCTS
(All to comply with the 2015 IPC)

2.01 SOIL AND WASTE PIPING MATERIALS AND PRODUCTS

- A. General - provide piping materials and factory fabricated piping products of sizes, types, pressure ratings and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes and types matching piping and equipment connections, provide fittings of materials which match pipe materials used in soil and waste piping systems. Where more than one type of materials or products are indicated, selection is Installer's option.

2.02 BASIC IDENTIFICATION

- A. General - provide identification complying with Specification Section 15057A, in accordance with the following listing:
1. Above ground soil, waste and vent piping - pipe markers.
 2. Underground building drain piping - underground type plastic line markers.

2.03 PIPE

- A. Below Ground:
1. Service weight cast iron with push-on gaskets, hub and spigot. Compression Gaskets shall conform to the requirements of ASTM Standard C564-14 and CISPI310.
- B. Above Ground:
1. Service weight C.I. soil pipe and fittings with no-hub joints. Make: Tyler pipe or equal by Eastern Foundry Co. Anaheim Foundry Co.
 2. Copper drainage tubing, type DWV, shall not be used on site.
 3. Exposed: Sch. 40 chrome plated brass, threaded, sponge cleanable.

2.04 COUPLINGS FOR NO-HUB PIPE

- A. Description: Type 304 stainless steel shield and 3/8" slot head 304 stainless steel screws. All other component metal parts shall be 304 stainless steel. The coupling sealing gasket shall be made of Neoprene as the sole elastomer. A cast iron coupling may be used.

Do not use under ground. Coupling shall meet or exceed CISPE Standard 310.

B. Make: Anaheim Co., Tyler Pipe.

2.05 BASIC PIPING SPECIALTIES

A. General - provide piping specialties complying with Division 15A Basic Materials and Methods section, in accordance with the following listing:

1. Pipe escutcheons.
2. Mechanical sleeve seals.
3. Pipe sleeves.

2.06 BASIC SUPPORTS AND ANCHORS

A. General - provide supports, anchors and seals complying with Division 15A Basic Materials and Methods section "Supports and Anchors".

2.07 CLEANOUTS

A. General

1. Units shall meet all design parameters shown on the drawings.
2. Units shall be complete with all design features and accessories necessary to provide a coordinated installation (such as carpet markers, tile recesses, etc.).
3. Units shall be of the following sizes:
 - a. Line size for piping to 4".
 - b. 4" for piping from 5" to 8".
 - c. 6" for piping 10" and larger.
4. Location:
 - a. At each bend of more than 45 degrees.
 - b. At bottom of soil or waste stacks and rainwater leaders.
 - c. At 50' intervals or less on horizontal pipe lines 4" or smaller.
 - d. At 50' intervals or less horizontal pipe lines 5" or larger.
 - e. At exit of sanitary and storm drains from building.
 - f. Wherever shown on the drawings.
 - g. At the end of each branch line serving more than two fixtures.
5. Placement: must be located where they will be accessible. Check general construction drawings for location of lockers or other equipment which may prevent access.

B. Cleanout Types

1. Deck Plate Cleanout:
 - a. Adjustable cast iron floor cleanout with inside caulk outlet, adjustable ABS housing, clamp device, internal tapered bronze cleanout plug, secured round scoriated nickel alloy cover plate. Jay R. Smith Figure 4020.
2. Wall Plate Cleanout:

- a. Exposed installation: Cast iron 'T' branch cleanout tee with bronze tapered plug. Jay R. Smith Fig. 4510
- b. Concealed installation behind plaster, dry or masonry walls: Provide cleanout tee with bronze plug tapped for center screw similar to exposed installation with polished vandalproof stainless steel access plate.

3. Cleanout:

- a. Cast iron cleanout with straight body for caulking into soil pipe hub and fitted with bronze plug countersunk or raised head as required.

4. Exterior Cleanout:

- a. Round coated cast iron access frame, heavy duty scoriated (vandalproof), secured cover. Coated cast iron cleanout ferrule with inside caulk connection and recessed tapered thread bronze plug.

2.08 FLOOR DRAINS

- A. Drains and traps shall be same size as waste pipes. Provide clamping devices for drain flashing. Provide P-trap in outlet from each drain, or as shown on drawings.
- B. Drain bodies to be cast iron.
- C. Floor drains shall be by Jay R. Smith, Zurn, Watts or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION OF BASIC IDENTIFICATION

- A. General - install plumbing identification in accordance with Specification Section 15057A.

3.02 INSTALLATION OF SOIL WASTE AND VENT PIPING

- A. General - install soil and waste piping in accordance with Division 15A Basic Materials and Methods section "Pipe, Tube and Fittings" and with Plumbing Code having jurisdiction.
- B. Solder joints use Type 1 solder.
- C. Insulate vent piping within three feet of passage through roof.

3.03 INSTALLATION DRAINAGE PIPING - SANITARY

- A. Changes in direction long sweep bends or 1/8 and/or 1/16 bends.
- B. Connections of branches to mains with "Y" fittings and 1/8 and/or 1/16 bends.
- C. All connections of horizontal into vertical piping with long turn sanitary "T-Y's".
- D. Grade the "horizontal" piping 1/4" per foot, minimum for 2 1/2 " or less, 1/8" per foot minimum for 3" and larger.

3.04 TURNS AND OFFSETS

A. Turns:

1. From vertical to horizontal:
 - a. Less than 3": Use long sweep or extra-long turn elbow.
 - b. 3" and larger: Use short sweep or 90° short turn fittings.
 - c. Horizontal piping: Use 45° wyes, long sweeps: 1/4, 1/6, 1/8 and 1/16 bends or any combination of same.
 - d. For vents in any direction; Use quarter bends or 90° short turn fittings.

B. Offsets:

1. Make offsets at no less than 45° angle to the horizontal in the following cases:
 - a. Offsets in stack vent portion of soil and waste stacks (above the highest fixture drainage connection).
 - b. Offset in vent stacks.
 - c. Grade the "horizontal" piping 1/4" per foot.
 - d. Connect all plumbing fixtures into sanitary house drain. No case shall soil or waste pass through more than one trap before entering house drain.

3.05 INSTALLATION OF VENT PIPING

- A. Provide vents shown and required by Plumbing Code.
- B. Grade vents to discharge water of condensation.
- C. Make offsets at 45 degree angle.
- D. Connect upper ends of drainage lines to vent system or extend through roof without decreasing size.
- E. Arrange vents and connections except wet vents, so not to carry drainage.
- C. Connect bottom to drains so drainage will wash out rust and scale.
- D. Extend vents above floor line to not less than 6" above flood rim of highest fixture before running horizontally.
- E. Terminate vents 18 inches above roof line.
- F. Increase pipes smaller than 3" to 3" from 18 inches below roof to terminus, using standard length tapered increasers.

3.06 INSTALLATION OF PIPING SPECIALTIES

- A. Install piping specialties in accordance with Division 15A Basic Materials and Methods section.

3.07 INSTALLATION OF SUPPORTS AND ANCHORS

- A. Install supports, anchors and seals in accordance with Division 15A Basic Materials and Methods section.

3.08 INSTALLATION OF DRAINAGE PIPING PRODUCTS

- A. Cleanouts - install in sanitary above ground piping and sanitary building drain piping as indicated, as required by Plumbing Code, and at each change in direction of piping greater than 45 degrees, at minimum intervals of 50' for piping 4" and smaller and 50' for larger piping, and at base of each vertical soil or waste stack. Install floor and wall cleanout covers for concealed piping.
- B. Flashing flanges - install flashing flange and clamping device with each stack and cleanout passing through waterproof membranes.

3.09 INSTALLATION OF FLOOR DRAINS

- A. General - install floor drains in accordance with manufacturer's written instructions and in locations indicated.
- B. Coordinate with soil and waste piping as necessary to interface floor drains with drainage piping systems.
- C. Install floor drains at low points of surface areas to be drained, or as indicated. Set tops of drains flush with finished floor.
- D. Install drain flashing collar or flange so that no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes, where penetrated.
- E. Position drains so that they are accessible and easy to maintain.

3.10 FLASHING

A. General

- 1. Flash openings with 6 lb. copper flashing.
- 2. Make watertight, allow for expansion and contraction.

B. Vent pipes

- 1. Extend not less than 12" from base of pipe.
- 2. Turn flashing over edge on cast iron; extend into same one (1) inch.
- 3. Ream coupling screw down over flashing at least one (1) inch screwed pipe.
- 4. Copper flashing assembly acceptable.

- C. Waterproof pipes through waterproof walls or floors: See details on drawings.

3.11 EQUIPMENT CONNECTIONS

- A. Piping runouts to fixtures - provide soil and waste piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated, but in no case smaller than required by Plumbing Code. Traps and tailpieces shall be chrome plated brass. Waste stubs out of wall (exposed) shall be sch. 40 threaded chrome plated brass. All exposed surfaces shall be sponge cleanable.

3.12 INSPECTION AND TEST

- A. New drainage piping shall be subjected to hydrostatic pressure test, see requirements in Section 15985, "Plumbing Testing, Adjusting and Balancing".

3.13 PROTECTION

- A. Protect drains during remainder of construction period, to avoid clogging with construction materials and debris and to prevent damage from traffic and construction work.

END OF SECTION

DIVISION 15A - PLUMBING

SECTION 15440A - PLUMBING FIXTURES AND TRIM

PART 1 - GENERAL

1.01 SUMMARY OF ITEMS INCLUDED

- A. Extent of plumbing fixtures and trim work is indicated by drawings and by requirements of this section.
- B. Types of plumbing fixtures required for the project including but not limited to, the following:
 - 1. Water closets.
 - 2. Urinals.
 - 3. Lavatories.
 - 4. Sinks.
 - 5. Mop sinks.
 - 6. Electric water coolers.
 - 7. Specialty faucets.
 - 8. Showers
 - 9. Floor Drain
 - 10. Hose Bibbs
 - 11. Emergency Eye Wash/Showers
 - 12. Drinking Fountains
 - 13. Bathtubs
 - 14. Shower Bases
- C. Refer to Division 16 sections for electrical connections to following plumbing fixtures, not work of this section.
 - 1. Electric water coolers.
 - 2. Electronic flush valves and faucets.

1.02 SUBMITTALS

- A. Product Data: Submit Product Data and installation instructions for each fixture, faucet, specialties, accessories, trim etc.
 - 1. Clearly indicate rated capacities of selected models of water coolers.
 - 2. Identify compliance with specified ANSI, UL, ASHRAE and New York State Standards, Codes and Listings and Lead Free Standards. (NSF)
- B. Shop Drawings: Submit rough-in drawings. Detail dimensions, rough-in requirements, required clearances and methods of assembly of components and anchorages. Coordinate requirements with Architectural Woodwork shop drawings for fixtures installed in countertops and cabinets. Furnish templates for use in woodwork shop.
- C. Wiring Diagrams: Submit manufacturer's electrical requirements and wiring diagrams for power supply to units. Clearly differentiate

between portions of wiring that are factory installed and field installed portions.

- D. Color Charts: Submit manufacturer's standard color charts for fixture colors.

1.03 QUALITY ASSURANCE

- A. Plumbing code compliance: Comply with applicable portions of New York State Uniform Fire Protection and Building Code, especially Article 9, Plumbing Requirements, and any local codes or regulations that apply pertaining to plumbing material, and 2015 IPC.

- B. New York State Law plumbing fixtures to comply with New York State Conservation Law 15-0314.

1. Lavatory faucets: 0.5 gpm self-closing faucet, or a metering faucet which limits discharge to a maximum of 0.25 gallons per cycle.
2. Sink faucets: 2.2 gpm.
3. Urinal flush valves: .5 gal. per flush.
4. Water closets: 1.3 gal. per flush.
5. Shower Head: 2.0 gpm

- C. Plumbing fixture standards: Comply with applicable portions of National Standard Plumbing Code pertaining to materials and installation of plumbing fixtures.

- D. Codes and Standards

1. ASHRAE Standard 18: "Method of Testing for Rating Drinking Water Coolers with Self-Contained Mechanical Refrigeration Systems.
2. Add NSF Lead Free
3. ARI Standard 1010: "Self-Contained Mechanically-Refrigerated Drinking-Water Coolers".
4. ICC Standard A117.1-09: "Specifications for Making Buildings and Facilities Accessible To and Usable By Physically Handicapped People".
5. Public Law 90-480: "Architectural Barriers Act of 1968".
6. UL Standard 399: Standard for "Drinking-Water Coolers".
7. Public Law 101-336: "Americans with Disabilities Act".
8. ANSI A117.1 - Accessible and Usable Buildings and Facilities
9. ASHRAE Std 18 - Methods of Testing for Rating Drinking-Water Coolers with Self-Contained Mechanical Refrigeration; 2008.
10. ASME A112.6.1M - Supports for Off-the Floor Plumbing Fixtures for Public Use; 1997 (Reaffirmed 2002).
11. ASME A112.18.1 - Plumbing Supply Fittings; 2012.
12. ASME A112.19.2 - Ceramic Plumbing Fixtures; 2013.
13. ASME A.112.19.3 - Stainless Steel Plumbing Fixtures (Designed for Residential Use); 2008 (R2013).
14. ASME A112.19.5 - Flush Valves and Spuds for Water Closets,

- Urinals, and tanks; 2011
15. NSF 61 - Drinking Water System Components - Health Effects; 2014 (Errata 2015).
 16. NSF 372 - Drinking Water System Components - Lead Content; 2011

1.04 DELIVERY, STORAGE AND HANDLING

- A. Store fixtures where environmental conditions are uniformly maintained within the manufacturer's recommended temperatures to prevent damage.
- B. Store fixtures and trim in the manufacturer's original shipping containers. Do not stack containers or store in such a manner that may cause damage to the fixture or trim.

1.05 SEQUENCE AND SCHEDULING

- A. Schedule rough-in installations with the installation of other building components.

PART 2 - PRODUCTS

2.01 PLUMBING FIXTURES

- A. General: Type, style, and material indicated, including stops, valves, faucets, strainers, wastes, escutcheons, bolts, screws, bushings, etc.
- B. Fixtures of same type must be furnished by single manufacturer.

2.02 MATERIALS

- A. Provide materials which have been selected for their surface flatness and smoothness. Exposed surfaces which exhibit pitting, seam marks, roller marks, foundry sand holes, stains, decoloration, or other surface imperfections on finished units are not acceptable.
- B. Fittings, trim and accessories to be copper or brass unless otherwise noted.
 1. Exposed or semi-exposed: Bright chrome-plated units.
 2. Escutcheons: Cast brass, bright chrome-plated with set screw.
- C. Stainless steel sheets: ANSI/ASTM A 167, Type 302/304, hardest workable temper.
 1. Finish: No. 4, bright, directional polish on exposed surfaces.
- D. Steel sheets for baked enamel finish: ANSI/ASTM A 591, coating Class C, galvanized bonderized.
- E. Steel sheets for porcelain enamel finish: ANSI/ASTM A 424, commercial quality, Type I.

- F. Galvanized steel sheet: ANSI/ASTM A 526, except ANSI/ASTM A 527 for extensive forming, ANSI/ASTM A 525, G90 zinc coating, and chemical treatment.
- G. Vitreous china: High quality, free from fire cracks, spots, blisters, pinholes and specks, glaze exposed surfaces, and test for crazing resistance in accordance with ANSI/ASTM C 554.
- H. Fiberglass: ANSI Z 124, smooth surfaced, with color selected by Architect/Engineer.
- I. Synthetic stone: High quality, free from defects, glaze on exposed surfaces, stain resistant.
- J. Manufacturer
 - 1. Fixtures: American Standard, Crane, Kohler, Eljer.
 - 2. Flush valves: American Standard, Sloan.
 - 3. Closet seats: Church, Beneke, Bemis.
 - 4. Chair carriers: Josam, Smith, Zurn.
 - 5. Supplies and traps: Fixture manufacturer or McGuire, Eastman Central D, Brass Craft, Bridgeport Brass.
 - 6. Master mixing valves: Powers, Symmons, Leonard.

2.03 PLUMBING FITTINGS, TRIM & ACCESSORIES

- A. Refer to the "Plumbing Fixture Schedule" on the contract drawings for plumbing fixture manufacturer / model number information.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify all dimensions by field measurements. Verify that all plumbing fixtures may be installed in accordance with pertinent codes and regulations, the original design and the referenced standards.
- B. Examine rough-in for potable water and waste piping systems to verify actual locations of piping connections prior to installing fixtures.
- C. Examine walls, floors and cabinets for suitable conditions where fixtures are to be installed.
- D. Do not proceed until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install plumbing fixtures level and plumb in accordance with fixture manufacturer's written instructions, rough-in drawings and pertinent codes and regulations, the original design and the referenced standards.

- B. Comply with the installation requirements of ICC Standard A117.1, Public Law 90-480 and Public Law 101-336 with respect to plumbing fixtures for the physically handicapped.
 - 1. Water closets flush valve handle on open side of fixtures.
 - 2. Insulate water supply and drain pipes under wheelchair accessible lavatories and sinks or as otherwise shown on drawings.
- C. Fasten plumbing fixtures securely to supports or building structure. Secure supplies behind or within wall construction to provide rigid installation.
- D. Set following in a leveling bed of cement grout.
 - 1. Mop sinks.
 - 2. Tubs.
- E. Install a Lead Free stop valve in an accessible location in the water connection to each fixture.
- F. Install escutcheons at following locations:
 - 1. Wall penetrations, exposed finished locations.
 - 2. Floor penetrations, exposed finished locations.
 - 3. Ceiling penetrations, exposed finished locations.
 - 4. Within cabinets and millwork.
- G. Seal fixtures to walls and floors using silicone sealants or latex caulking. Match sealant color to fixture color.
- H. Install a sediment trap at each sink or grouping of sinks in Art Rooms. Install so that trap may be easily serviced and removed.

3.03 EQUIPMENT TO BE FURNISHED BY OTHERS

- A. Make complete plumbing connections to fixtures and equipment to be furnished by others. Secure exact locations and roughing-in dimensions before beginning work.
- B. Provide approved supplies with stops and escutcheons, cast brass traps and wastes with CO plug and escutcheon.
- C. All exposed piping chrome plated.
- D. Equipment shall be chrome plated except piping located below equipment.

3.04 FIELD QUALITY CONTROL

- A. Test fixtures to demonstrate proper operation upon completion of installation and after units are water pressurized.
- B. Inspect each installed unit for damage and operation. Replace damaged or faulting operating fixtures.

3.05 CLEANING

- A. Clean fixtures, trim and strainers using manufacturer's recommended cleaning methods and materials.

3.06 PROTECTION

- A. Provide protective covering for installed fixtures, water coolers and trim.
- B. Do not allow use of fixtures for temporary facilities unless expressly approved in writing by the Owner.

3.07 SPARE PARTS

- A. Furnish special wrenches, water filters and other devices necessary for servicing plumbing fixtures and trim to Owner with receipt in a quantity of one device for each 10 fixtures.
- B. Furnish faucet repair kits complete with all necessary washers, springs, pins, and retainers, packings, O-rings, sleeves and seats in a quantity of 1 kit for each 40 faucets.

END OF SECTION

DIVISION 15a - PLUMBING

SECTION 15511a - 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 ductwork, 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 16050 - 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.
- 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 combustibile 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 combustibile 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 15A - PLUMBING

SECTION 15985A - PLUMBING, TESTING, ADJUSTING AND BALANCING

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.

1.02 DESCRIPTION OF WORK

- A. Extent of testing, adjusting and balancing work is indicated by requirements of this section, and also by drawings and schedules.
- B. Component types of testing, adjusting and balancing specified in this section includes the following:
 - 1. Rough sanitary and storm piping.
 - 2. Water supply system.
 - 3. Gas system - Refer to 15488A

1.03 QUALITY ASSURANCE

- A. Installer - a firm with at least 3 years of successful testing, adjusting and balancing experience on projects with testing and balancing requirements similar to those required for this project.

1.04 REQUIREMENTS

- A. No system shall be covered or concealed until tested, approved.
- B. Pay for Permit and Inspection Fees required by Authority having jurisdiction.
- C. Test in presence of Owner's Representative and Plumbing Inspector.
- D. Prove tight for period stated or longer if required.
- E. Tests may be made in sections.

1.05 CODES AND REQUIREMENTS

- A. Comply with latest editions and applicable portions of International Plumbing Code, Local Plumbing Standards, New York State Building Code, especially Article 9, Plumbing Requirements and Plumbing Code.
- B. Comply with applicable portions of Standards for Waste Treatment Works, New York State.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Provide test equipment and materials necessary for tests.

PART 3 - EXECUTION

3.01 GENERAL

- A. Examine installed work and conditions under which testing is to be done to ensure that work has been completed, cleaned and is operable.
- B. Test, adjust and balance systems and components as indicated, in accordance with procedures outlined below and in applicable standards. Test which follows shall be considered minimum standards.

3.02 TESTS & INSPECTIONS TO BE

- A. Rough Sanitary and Storm Piping.
 - 1. Stop openings, fill with water to top of highest vent. Water shall hold constant for two (2) hours.
 - 2. May be tested in sections using water pressure test.
 - 3. Test pressure shall be equal to at least 10 ft. water column at all points.
 - 4. Retest at least upper 10 ft. of next lower section.
 - 5. Compliance with the Department of Health Lead in Water Regulation is located on Drawings.
- B. Water Supply System.
 - 1. Fill, subject to 125 psig hydrostatic pressure at lowest level for two (2) hours.
 - 2. Fixtures shall not be connected into system during test.
 - 3. After fixtures are connected, test system for two (2) hours, at 75 PSIG or prevailing water pressure, whichever is higher.
 - 4. Regulate flow of water to each fixture.
 - 5. Adjust balancing valves on hot water system.
 - 6. Faucets, flush valves shall operate satisfactorily without waste of water, without objectionable noise.

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 Contractor 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 (NFPA 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 and 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 cut 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 'O' 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):

	<u>120/208V</u>	<u>277/480v</u>
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 for 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, Siemens, 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 16470 - PANELBOARDS
PART 1 - GENERAL

1.01 SCOPE

- A. The Contractor shall furnish and install the panelboards as specified and as shown on the contract drawings.

1.02 RELATED SECTIONS

- A. Not Used.

1.03 REFERENCES

- A. The panelboards and all components shall be designed, manufactured and tested in accordance with the latest applicable standards of NEMA and UL as follows:
 - 1. UL 67 -- Panelboards
 - 2. UL 50 -- Cabinets and boxes
 - 3. NEMA PB1
 - 4. Fed. Spec. W-P-115C
 - 5. Circuit breaker -- Type I class I
 - 6. Fusible switch -- Type II class I.

1.04 SUBMITTALS -- FOR REVIEW/APPROVAL

- A. The following information shall be submitted to the Engineer:
 - 1. Breaker layout drawing with dimensions indicated and nameplate designation
 - 2. Component list
 - 3. Conduit entry/exit locations
 - 4. Assembly ratings including:
 - a. Short-circuit rating
 - b. Voltage
 - c. Continuous current
 - 5. Cable terminal sizes.
- B. Where applicable the following additional information shall be submitted to the Engineer:
 - 1. Key interlock scheme drawing and sequence of operations.
- C. Submit three (3) copies of the above information.

1.05 SUBMITTALS -- FOR INFORMATION

- A. When requested by the Engineer the following product information shall be submitted:
 - 1. Descriptive bulletins
 - 2. Product sheets.

1.06 SUBMITTALS -- FOR CLOSEOUT

- A. The following information shall be submitted for record purposes:
 - 1. Final (as-built) drawings and information for items listed in section 1.04
 - 2. Installation information
 - 3. Seismic certification and equipment anchorage details.
- B. Submit three (3) copies of the above information.

1.07 QUALIFICATIONS

- A. The manufacturer of the panelboard shall be the manufacturer of the major components within the assembly, including circuit breakers and fusible switches.
- B. For the equipment specified herein, the manufacturer shall be ISO 9000, 9001 or 9002 certified.
- C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.
- D. The panelboards shall be suitable for and certified to meet all applicable seismic requirements of Uniform Building Code (UBC)] for zone 2 application. Guidelines for the installation consistent with these requirements shall be provided by the switchgear manufacturer and be based upon testing of representative equipment. The test response spectrum shall be based upon a 5% minimum damping factor, UBC: a peak of 0.7g, and a ZPA of 0.38g. The tests shall fully envelope this response spectrum for all equipment natural frequencies up to at least 35 Hz.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

1.09 OPERATION AND MAINTENANCE MANUALS

- A. Three (3) copies of the equipment operation and maintenance manuals shall be provided.
- B. Operation and maintenance manuals shall include the following information:
 - 1. Instruction books and/or leaflets
 - 2. Recommended renewal parts list
 - 3. Drawings and information required by section 1.06.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Cutler-Hammer
- B. Square D
- C. General Electric
- D. Siemens

2.02 RATINGS

- A. Panelboards rated 240 Vac or less shall have short-circuit ratings as shown on the drawings or as herein scheduled, but not less than 22,000-amperes RMS symmetrical.
- B. Panelboards rated 480 Vac shall have short-circuit ratings as shown on the drawings or as herein scheduled, but not less than 22,000-amperes RMS symmetrical.
- C. Panelboards shall be labeled with a UL short-circuit rating. When series ratings are applied with integral or remote upstream devices, a label or manual shall be provided. It shall state the conditions of the UL series ratings including:
 - 1. Size and type of upstream device
 - 2. Branch devices that can be used
 - 3. UL series short-circuit rating.

2.03 CONSTRUCTION

- A. Interiors shall be completely factory assembled devices. They shall be designed such that switching and protective devices can be replaced without disturbing adjacent units and without removing the main bus connectors.
- B. Trims for lighting and appliance panelboards shall be supplied with a hinged door over all circuit breaker handles. Doors in panelboard trims shall not uncover any live parts. Doors shall have a semiflush cylinder lock and catch assembly. Doors over 48 inches in height shall have auxiliary fasteners.
- C. Distribution panelboard trims shall cover all live parts. Switching device handles shall be accessible.
- D. Surface trims shall be same height and width as box. Flush trims shall overlap the box by 3/4 of an inch on all sides.
- E. A directory card with a clear plastic cover shall be supplied and mounted on the inside of each door.
- F. All locks shall be keyed alike.

2.04 BUS

- A. Main bus bars shall be plated copper sized in accordance with UL standards to limit temperature rise on any current carrying part to a maximum of 65 degrees C above an ambient of 40 degrees C maximum.
- B. A bolted ground bus shall be included in all panels.
- C. Full-size (100%-rated) insulated neutral bars shall be included for panelboards shown with neutral. Bus bar taps for panels with single-pole branches shall be arranged for sequence phasing of the branch circuit devices. Neutral busing shall have a suitable lug for each outgoing feeder requiring a neutral connection. 200%-rated neutrals shall be supplied for TVSS panels designated on drawings.

2.05 DISTRIBUTION PANELBOARDS -- CIRCUIT BREAKER TYPE

- A. Distribution panelboards with bolt-on devices contained therein shall have series or integrated rated interrupting ratings as indicated on the drawings. Panelboards shall be Cutler-Hammer type Westinghouse Pow-R Line C, PRL-3a or PRL-4B. Panelboards shall have molded case circuit breakers as indicated below.
- B. Distribution panelboards with plug-on devices contained therein shall have series rated interrupting ratings as indicated on the drawings. Panelboards shall be Cutler-Hammer type Pow-R Line C, PRL-5P. Panelboards shall have molded case circuit breakers permanently affixed to plug on breaker adapter, as indicated below.

- C. Molded case circuit breakers shall provide circuit overcurrent protection with inverse time and instantaneous tripping characteristics and shall be Cutler-Hammer type Westinghouse Series C or approved equal. Ground fault protection shall be provided where indicated.
- D. Circuit breakers shall be operated by a toggle-type handle and shall have a quick-make, quick-break over-center switching mechanism that is mechanically trip-free. Automatic tripping of the breaker shall be clearly indicated by the handle position. Contacts shall be nonwelding silver alloy and arc extinction shall be accomplished by means of DE-ION arc chutes. A push-to-trip button on the front of the circuit breaker shall provide a local manual means to exercise the trip mechanism.
- D. Circuit breakers shall have a minimum symmetrical interrupting capacity as indicated on the drawings.
- F. Where indicated, circuit breakers shall be UL listed for series application.
- G. Where indicated, circuit breakers shall be current limiting.
- H. Circuit breakers below 400^o ampere frame shall be Cutler-Hammer type Westinghouse Series C, with thermal-magnetic trip units, and inverse time-current characteristics.
- I. Circuit breakers 400 ampere and above ampere frame shall be Cutler-Hammer type Westinghouse Series C, with microprocessor-based RMS sensing trip units.
 - 1. Each molded case circuit breaker microprocessor-based tripping system shall consist of three current sensors, a trip unit, and a flux-transfer shunt trip. The trip unit shall use microprocessor-based technology to provide the adjustable time-current protection functions. True RMS sensing circuit protection shall be achieved by analyzing the secondary current signals received from the circuit breaker current sensors and initiating trip signals to the circuit breaker trip actuators when predetermined trip levels and time delay settings are reached.
 - 2. Interchangeable rating plugs shall establish the continuous trip ratings of each circuit breaker. Rating plugs shall be fixed or adjustable as indicated. Rating plugs shall be interlocked so they are not interchangeable between frames, and interlocked such that a breaker cannot be closed and latched with the rating plug removed.
 - 3. The microprocessor-based trip unit shall have thermal memory

capabilities to prevent the breaker from being reset following an overload condition until after a preset time delay.

4. When the adjustable instantaneous setting is omitted, the trip unit shall be provided with an instantaneous override. Internal ground fault protection adjustable pick-up ratings shall not exceed 1200-amperes. Provide neutral ground fault current sensor for four wire loads.
5. Breakers shall have built-in test points for testing the long-time delay, instantaneous, and ground fault functions of the breaker, by means of a 120-volt operated test set. Provide one test set capable of testing all breakers 400-ampere frame and above.
6. System coordination shall be provided by the following microprocessor-based time-current curve shaping adjustments:

Adjustable long-time pick-up

Adjustable short-time pick-up and delay, with

selective curve shaping

Adjustable instantaneous pick-up

Adjustable ground fault pick-up and delay, with

selective curve shaping.
7. Circuit Breakers shall be Cutler-Hammer type Westinghouse Series C circuit breakers, microprocessor-based RMS sensing trip units type Digitrip RMS 310.

2.06 BRANCH CIRCUIT PANELBOARDS

- A. The minimum integrated short-circuit rating for branch circuit panelboards shall be 22,000 ampere.
 - B. Bolt-in type, heavy-duty, quick-make, quick-break, single- and multi-pole circuit breakers of the types specified herein, shall be provided for each circuit with toggle handles that indicate when unit has tripped.
 - C. Circuit breakers shall be thermal magnetic type with common type handle for all multiple pole circuit breakers. Circuit breakers shall be minimum 100-ampere frame and through 100-ampere trip sizes shall take up the same pole spacing. Circuit breakers shall be UL listed as type SWD for lighting circuits.
1. Circuit breaker handle locks shall be provided for all

circuits that supply exit signs, emergency lights, energy management, and control system (EMCS) panels and fire alarm panels.

- D. Circuit breakers shall have a minimum interrupting rating of 10,000-amperes symmetrical at 240-volts, and 14,000-amperes symmetrical at 480-volts.

2.07 ACCESSORIES

- A. When specified on plans provide transient voltage surge suppression as specified in section 16671.

2.08 ENCLOSURE

- A. Enclosures shall be at least 20 inches wide made from galvanized steel. Provide minimum gutter space in accordance with the National Electric Code. Where feeder cables supplying the mains of a panel are carried through its box to supply other electrical equipment, the box shall be sized to include the additional required wiring space. At least four interior mounting studs with adjustable nuts shall be provided.
- B. Enclosures shall be provided with blank ends.

2.09 NAMEPLATES

- A. Provide an engraved nameplate for each panel section.

2.10 FINISH

- A. Surfaces of the trim assembly shall be properly cleaned, primed, and a finish coat of gray ANSI 61 paint applied.

PART 3 - EXECUTION

3.01 FACTORY TESTING

- A. The following standard factory tests shall be performed on the equipment provided under this section. All tests shall be in accordance with the latest version of NEMA and UL standards.

3.02 INSTALLATION

- A. The Contractors shall install all equipment per the manufacturer's recommendations and the contract drawings.

END OF SECTION

DIVISION 16 - ELECTRICAL

SECTION 16475 - CIRCUIT BREAKERS

PART 1 - GENERAL

(NOT USED)

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Cutler-Hammer
- B. Square D
- C. General Electric
- D. Siemens

2.02 MOLDED CASE PROTECTIVE DEVICES

- A. Protective devices shall be molded case circuit breakers with inverse time and instantaneous tripping characteristics and shall be Cutler-Hammer type Westinghouse Series C or approved equal.
- B. Circuit breakers shall be operated by a toggle-type handle and shall have a quick-make, quick-break over-center switching mechanism that is mechanically trip-free. Automatic tripping of the breaker shall be clearly indicated by the handle position. Contacts shall be nonwelding silver alloy and arc extinction shall be accomplished by means of DE-ION arc chutes. A push-to-trip button on the front of the circuit breaker shall provide a local manual means to exercise the trip mechanism.
- C. Circuit breakers shall have a minimum symmetrical interrupting capacity as indicated on the drawings, but less than 10,000 amperes RMS symmetrical.
- D. Circuit breakers below 400 ampere frame and below shall be Cutler-Hammer type Westinghouse Series C with thermal-magnetic trip units and inverse time-current characteristics.
- E. Circuit breakers 400 and greater ampere frame shall be Cutler-Hammer type Westinghouse Series C with microprocessor-based RMS sensing trip units.
- F. Circuit breakers frame size and lug size shall be sized per cable size as shown on plans and as installed.

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

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- 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 combustibile 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 combustibile 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