P R O J E C T M A N U A L

Specifications For:

District Wide A/C – Electrical Upgrades

NYSED Approved October 17, 2024

Issued for BID November 18, 2024

Newburgh Enlarged Central School

District

124 Grand Street
Newburgh, NY 12550

SED Project Control No(s).

Gidney Avenue Elementary School	44-16-00-01-0-006-015
Meadow Hill Gem School	44-16-00-01-0-035-014
Temple Hill Academy	44-16-00-01-0-036-015

LaBella Associates DPC. Project No.2233600

NOTICE

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT TO ALTER ANY ITEM ON THIS DOCUMENT IN ANY WAY. ANY LICENSEE WHO ALTERS THIS DOCUMENT IS REQUIRED BY LAW TO AFFIX HIS OR HER SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS OR HER SIGNATURE AND A SPECIFIC DESCRIPTION OF ALTERATIONS WHICH WERE MADE.



EXP: 05.31.25

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LaBella
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DOCUMENT 000115 - LIST OF DRAWING SHEETS

1.1 LIST OF DRAWINGS

A. Drawings: Drawings consist of the Contract Drawings and other drawings listed in the Sheet List on the Cover page of the separately bound drawing set titled District Wide A/C – Electrical Upgrades, dated November 12, 2024, as modified by subsequent Addenda and Contract modifications.

B. List of Drawings: Drawings consist of the following Contract Drawings and other drawings of type indicated:

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GIDNEY AVENUE MEMORIAL SCHOOL

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C101	Map of Topographic Survey
C130	Site Plan Equipment Pad North
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ARCHITECTURAL

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A301	First Floor Construction Reflected Ceiling Plan
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AD102	Second Floor Demolition Plan
AD301	First Floor Demolition Reflected Ceiling Plan
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LS101	Life Safety First Floor Plan
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STRUCTURAL

S001	Structural Notes
S101	First Floor Wall Penetration Plan & Sections

MECHANICAL

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M002	Ventilation Table
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MD102	Second Floor Demolition Plan
M103	Roof Mechanical Plan
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M102	Second Floor Mechanical Plan
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E002 Electrical Notes, Symbol Legend & Abbreviations
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E500 Electrical Details
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HAZARDOUS MATERIALS
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MEADOW HILL GEM SCHOOL

ARCHITECTURAL
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STRUCTURAL
S001 Structural Notes
S101 First Floor & Roof Dunnage & HVAC Support Plans
S102 Vault/ Loading Dock Ceiling and Slab Repair Plan
S300 Sections
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MECHANICAL

M001 Mechanical Legend Sheet
M002 Ventilation Table
MD101 First Floor Demolition Plan
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ELECTRICAL

E001 Electrical Notes, Symbol Legend & Abbreviations
E002 Electrical Notes, Symbol Legend & Abbreviations
E100 Basement Electrical Power Plan
E101 First Floor Electrical Power Plan
E102 Second Floor Electrical Power Plan
E103 Roof Electrical Power Plan
E500 Electrical Details
E600 Electrical Panel Schedules
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E602 Electrical Panel Schedules
E631 Electrical System Schedules
E632 Electrical System Schedules
E700 Electrical One-Line Diagram
ED100 First Floor Electrical Demolition Plan
ED101 Second Floor Electrical Demolition Plan
ED102 Roof Electrical Demolition Plan

HAZARDOUS MATERIALS

H101 First Floor Hazardous Material Removal Plan
H102 Second Floor Hazardous Material Removal Plan
H103 Roof Hazardous Material Removal Plan

TEMPLE HILL ACADEMY

ARCHITECTURAL

A100 Basement Floor Plan
A101 First Floor Construction Plan
A102 Second Floor Construction Plan
A103 Roof Plan and Roof Details
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A301 First Floor Construction Reflected Ceiling Plan

A302 Second Floor Construction Reflected Ceiling Plan
AD101 First Floor Demolition Plan
AD102 Second Floor Demolition Plan
AD301 First Floor Demolition Reflected Ceiling Plan
AD302 Second Floor Demolition Reflected Ceiling Plan
LS100 Life Safety Basement Floor Plan
LS101 Life Safety First Floor Plan
LS102 Life Safety Second Floor Plan

STRUCTURAL
S001 Structural Notes
S101 First Floor & Roof Dunnage & HVAC Support Plans
S102 Vault/ Loading Dock Ceiling and Slab Repair Plan
S300 Sections
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MECHANICAL
M001 Mechanical Legend Sheet
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E001 Electrical Notes, Symbol Legend & Abbreviations
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HAZARDOUS MATERIALS

H101 First Floor Hazardous Material Removal Plan
H102 Second Floor Hazardous Material Removal Plan
H103 Roof Hazardous Material Removal Plan

END OF DOCUMENT 000115

SECTION 001116 - INVITATION TO BID

Architect	Project Information
LaBella	Newburgh Enlarged City School District
21 Fox St	124 Grand Street
Poughkeepsie, New York 12601	Newburgh NY
PH: 845-454-3980	2019 Capital Project

The Owner, Newburgh Enlarged City School District, will receive sealed bids to furnish materials and labor to complete the HVAC upgrades and new installation and interior/exterior renovations work across schools specified within the 2019 Bond Project. Each bid shall be on a stipulated sum basis for the following contract:

Multiple Project Contract consisting of the following prime contracts:

1. Mechanical Construction
2. Electrical Construction
3. General Construction

Bids shall not include New York State sales and compensating use taxes on materials and supplies incorporated into the Work, the Owner being exempt therefrom. Two copies of sealed bids in an envelope on which is clearly stated the contract no. and title shall be submitted to the district address listed above and received by mail prior to **3:00 PM on December 18, 2024.** Bids received after this time will not be accepted and returned to the Bidder unopened. Bids will be opened publicly and read aloud after specified receipt time. All interested parties are invited to attend.

Bidding/Contract Document drawings and specifications may be examined on and after **November 18, 2024** free of charge at the following locations:

Architect	REV
LaBella	28 Church Street
21 Fox St	Unit 7
Poughkeepsie, New York 12601	Warwick, New York 10990

It is the intention of this Project to be both environmentally and fiscally conscious of paper use and consumption. Therefore, documents will be distributed as digital sets. Bidding Documents, Drawings

and Specifications, may be viewed online free of charge beginning **November 18, 2024,** at https://labella.biddyhq.com under Public Project. "public projects," or electronically downloaded for a non-refundable charge of one hundred dollars ($100.00.)

Complete sets of Bidding Documents, Drawings and Specifications, on compact disc (CD) in PDF format may be obtained from Labella, 4 British American Boulevard, Latham, New York 12110 Tel: (877) 272-0216 upon depositing the sum of one hundred dollars ($100.00) for each combined set of documents. Checks or money orders shall be made payable to Newburgh Enlarged City School District.

All bid addenda will be transmitted to registered plan holders via e-mail and will be available on Labella Associates, Pmarchese@labellapc.com and www.usinglesspaper.com. Plan holders who have paid for 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 the addenda to be issued. There will be no charge for registered plan holders to obtain hard copies of the bid addenda.

Each Bidder must deposit a Bid Security in the amount and form per the conditions provided in Instructions to Bidders. All Bids will remain subject to acceptance for forty-five (45) days after the Bid opening. Owner may, in its sole discretion, release any Bid and return Bid Security prior to that date.

A full performance bond, together with labor and material payment bonds in a form acceptable to the Owner, shall be required of the successful Bidder for the full contract amount.

The award of the bid pursuant to this notice is subject to the appropriation of funds for this purpose in accordance with the applicable provisions of the General Municipal Law. All bids must meet the requirements of the General Municipal law of the State of New York and all other applicable statutes and have attached a statement of non-collusion. All documents submitted in connection with this bid will become the property of the Newburgh Enlarged City School District, and the district will not return bids or bid documents.

The contract will be awarded by the school district to the lowest responsible bidder. In cases where two or more responsible Bidders submit identical bids as to price, the school district may award the contract to either of such bidders. The school district reserves the right to reject all bids and re-advertise for new bids in its discretion and/or to waive any informality in any bid which it deems immaterial in nature.

Pre-Bid Conferences will be held on November 27, 2024 starting at 8:00 AM at Gidney School, and continue to Meadow Hill School at 9:00am, and end at Temple Hill School starting at 11:00am. Jacobs Construction Manager Warren Sackman will be the on-site Contact Person, he can be reached at (516) 353-8666. Use this page to verify identification as a Bidder at the school's Main Office. Attendance of this meeting is requested as the Owner, Architect and consultants will be

present to discuss the Project. Attendees should anticipate a Q & A session followed by a walk-through of the building and site. The Contractors are responsible for formally submitting RFIs regarding any questions that may arise during the walkthrough.

This project is publicly funded. The Bidders must comply with New York State Department of Labor Prevailing Wage Rate Schedule and conditions of employment.

The Newburgh Enlarged City School District reserves the right to waive any informalities or irregularities in the Bids received, or to reject all Bids without explanation.

By Order Of:

Newburgh Enlarged City School District

END OF SECTION 001116

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DOCUMENT 002113 - INSTRUCTIONS TO BIDDERS

PART 1 – DEFINITIONS

A. Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Invitation to Bid, Instruction to Bidders, the Bid Form, Supplementary Bid Forms and other sample bidding and contract forms.

B. The proposed Contract Documents include the Contract Forms between the Owner and Contractor, the Contractor's executed Bid Form and executed Supplementary Bid Forms, Conditions of the Contract (General, supplemental, and other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.

C. Definitions set forth in the General Conditions of the Contract of Construction, or in other Contract Documents are applicable to the Bidding Documents.

D. Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

E. A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

1. Wherever the word "Bid" occurs in the documents, it refers to the Bidder's Proposal.

F. The Base Bid is an amount stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents.

G. An Alternate is an amount stated on the Bid Form to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

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

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

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

PART 2 – BIDDER'S REPRESENTATIONS

A. The Bidder by making a Bid represents that:

1. The Bidder has read and understands the Bidding Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being Bid concurrently or presently under construction.
2. The Bid is made in compliance with the Bidding Documents.
3. The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.
   a. Bidders may visit the existing facilities by making prior arrangements with Jacobs Construction Manager Warren Sackman (516) 353-8666 with Newburgh Enlarged City School District's approval.
4. The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.
5. No official, officer or agent of the Owner is authorized to make any representations as to the materials or workmanship involved or the conditions to be encountered and the Bidder agrees that no such statement or the evidence of any documents or plans, not a part of the Bidding Documents, shall constitute any grounds for claim as to conditions encountered. No verbal agreement or conversation with any officer, agent, or employee of the Owner either before or after the execution of this Contract shall affect or modify any of the terms or obligations herein contained.

B. Each Bidder is required to form an individual opinion of the quantities and character of construction work by personal examination of the site and all existing facilities where the project work is to be done, and of the plans and specifications relating to it by such means as is preferred. Each Bidder shall inspect accessible concealed areas of existing construction, provided no significant permanent damage is inflicted upon the property. Lack of knowledge about conditions in accessible concealed areas shall not be the basis for additional cost claims at a later time.

C. The Bidder's attention has been directed to the fact that all applicable state laws, municipal ordinances, and rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Contract throughout, and they are deemed to be included in the Contract Documents the same as though herein written out in full. By submitting a Bid, the Bidder acknowledges that if awarded the Contract it shall give all notices and comply with all laws, ordinances, rules, and regulations bearing on the conduct of the

Work as drawn and specified in the Contract Documents. By submitting a Bid, the Bidder acknowledges that if awarded the Contract it shall be required to observe all laws and ordinances including, but not limited to, relating to the obstructing of streets, maintaining signals, keeping open passageways, and protecting them where exposed to danger, and all general ordinances affecting it, its employees, or its work hereunder in its relations to the Owner or any person. By submitting a Bid, the Bidder acknowledges that if awarded the Contract, it shall also obey all laws and ordinances controlling or limiting the Contractor while engaged in the prosecution of the Work under the Contract.

D. The Bidder's attention is directed to the fact that Each Contractor shall pay not less than the minimum hourly wage rates on those contracts as established in accordance with Section 220 of the Labor Law as shown in the schedule included in the Bidding Documents. Article 8, Section 220 of the Labor Law, as amended by Chapter 750 of the Laws of 1956, provides (among other things) that it shall be the duty of the fiscal officer to make a determination of the schedule of wages to be paid to all laborers, workers and mechanics employed on public work projects, including supplements for welfare, pension, vacation, and other benefits. These supplements include hospital, surgical or medical insurance, or benefits; life insurance or death benefits; accidental death or dismemberment insurance; and pension or retirement benefits. If the amount of supplements provided by the employer is less than the total supplements shown on the wage schedule, the difference shall be paid in cash to the employee. Article 8, Section 220 of the Labor Law, as amended by Chapter 750 of the Laws of 1956, also provides that the supplements to be provided to laborers, workers, and mechanics upon public work, "...shall be in accordance with the prevailing practices in the locality...." The amount for supplements listed on the enclosed schedule does not necessarily include all types of prevailing supplements in the locality, and a future determination of the Industrial Commissioner may require the Contractor to provide additional supplements. The original payrolls or transcripts shall be preserved for three (3) years from the completion of the Work on the awarded project by the Contractor. The Owner shall receive such payroll record upon completion of the Project.

PART 3 – BIDDING DOCUMENTS

3.1 COPIES

A. As described in the Invitation to Bidders, it is the intention of this Project to be both environmentally and fiscally conscious of paper use and consumption. Therefore, documents will be distributed as digital sets in PDF format. Bidding Documents, Drawings, and Specifications may be viewed online free of charge

beginning on **November 18th, 2024** at https://labella.biddyhq.com under Public Projects or can be electronically downloaded for a non-refundable charge of One Hundred Dollars ($100.00) for set of documents requested.

1. Please note, in order to access online documents and information, a log in is required. New users can create a free online account upon visiting site by clicking "Register for an Account."

2. Deposit is refundable in accordance with the terms in the Instructions to Bidders to all submitting bids. Any Bidder requiring CD(s) to be shipped shall make arrangements with the printer and pay for all packaging and shipping costs.

3. Any Bidder requiring paper copies of the Bidding Documents, Drawings, and Specifications, shall make arrangements with the printer, and pay for all printing, packaging, and shipping costs. Such costs are non-refundable.

A. All Bid Addenda will be transmitted to registered plan holders via email in PDF format and will be available at Labella Associates D.P.C. and www.usinglesspaper.com. Plan holders who have paid for CDs or hard copies of the Bidding 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.

1. There will be no charge for registered plan holders to obtain hard copies of the Bid Addenda.

D. Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

E. The Owner and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

A. The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being Bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to

the Architect errors, inconsistencies or ambiguities discovered. All reports to the Architect shall be in writing.

B. No interpretation of the meaning of the Contract Documents, the existing conditions, or of the scope of Work will be made verbally. Provide every request for such interpretation in writing, addressed to Labella, Attention Pmarchese@labellapc.com, 19 Front Street, Newburgh, New York 12550, and to be given consideration must be received at least seven (7) working days prior to the date of the Bid Opening.

C. Interpretations, corrections, and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections, and changes of the Bidding Documents made in any other manner will not be binding, and Bidders are not required to rely upon them.

D. The Bidding Documents for this Project have been prepared using certain existing construction documents furnished by the Owner, which pertain to the construction of the existing conditions, and limited observations obtained by the Architect at the Project site.

1. More extensive investigations of existing conditions, including disassembly, or testing of existing building components, was not undertaken by the Architect.
2. Portrayal of such existing conditions obscured or concealed from the Owner or Architect's view prior to the start of this Project's construction activities, is based on reasonable implications and assumptions. The Owner and Architect do not imply or guarantee to the Bidders, in any way, that such portrayals are accurate or true existing conditions.

E. In the absence of an interpretation by the Architect, should the Drawings disagree in themselves or with the Specifications, the better quality, the more costly or the greater quantity of work or materials shall be estimated upon, and unless otherwise determined, shall be furnished.

3.3 EQUIVALENTS

A. The materials, products and equipment described in the Bidding Documents establish as standard of required function, dimension, appearance, and quality to be met by any proposed substitution and/or comparable product/equivalent. It is not the intention of the Owner or Architect to eliminate from consideration products that are equivalent in quality, appearance, and function to those specified.

B. In the specifications, two or more kinds, types, brands, or manufacturers or materials may be named. They shall be regarded as the required standard of quality, and overall, are judged to be equivalent by the Architect. The Bidder may select one of these named items as the basis for its Bid. If a Bidder proposes to use comparable products/equivalents other than those listed in the Project Manual, submit in accordance with subparagraph C below.

C. No substitution will be considered prior to receipt of Bids unless written request for approval on a Substitution Request (During the Bidding Phase) Form (Section 004325) has been received by the Architect at least ten (10) days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed equivalent would require, shall be included. The burden of proof of the merit of the proposed equivalent is upon the proposer. The Architect's decision of approval or disapproval of a proposed equivalent shall be final.

D. If the Architect approves a proposed equivalent prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

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

3.4 ADDENDA

A. Addenda will be transmitted to all that are known to have received a complete set of Bidding Documents. All such addenda shall become part of the Contract Documents and all Bidders shall be bound by such Addenda whether or not received by the Bidders.

1. Provide Bidding Document distributor with full company name, address, telephone, e-mail address and facsimile numbers and contact person’s name.

B. Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

C. Addenda will not be issued later than five (5) working days prior to the time specified for receipt of Bids, except any Addendum withdrawing the request for Bids or one which includes postponement of the time for receipt of Bids.

D. Each Bidder shall ascertain upon submitting a Bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt on the Bid Form.

3.5 TAX LIABILITY

A. Bidders are exempt from payment of manufacturer's excise taxes for materials purchased for the exclusive use of the Owner, provided that the manufacturer has complied with rules and regulation of the Commissioner of Internal Revenue Service.

B. New York State Sales Tax does not apply to this Project. Contractors are exempt from payment on purchase of materials for the execution of this Contract and such taxes shall not be included in Bids. Exemption Certificates will be provided upon request.

C. All other taxes shall be included in the Bid.

3.6 PRE-BID CONFERENCE

A. There will be a Pre-Bid Conference as detailed in the Invitation to Bidders. A lack of representation at the Pre-bid Conference will not be justification for additional costs due to unforeseen conditions during the construction phases of the Contracts.

PART 4 – BIDDING PROCEDURES

4.1 PREPARATION OF BIDS

A. Bids shall be submitted on forms identical to the Bid Forms contained in this Project Manual, or submitted using unaltered and legible copies thereof.

B. All blanks on the Bid Form shall be legible executed in a non-erasable medium. No Bid will be considered which does not include bids for all items listed in the proposal sheets.

C. Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.

D. Interlineations, alterations, and erasures must be initialed by the signer of the Bid.

E. Bid all requested alternates. If no change in the Base Bid is required, enter "No Change."

F. Each copy of the Bid shall state the legal name of the Bidder and the nature of legal form of the Bidder. The Bidder shall provide evidence of legal authority to perform within the jurisdiction of the Work. Each Bid copy shall be signed by the person or persons legally authorized to bind the Bidder to a Contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

G. Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall make no additional stipulations on the bid form nor qualify the Bid in any other manner.

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

4.2 BID SECURITY

A. Each Bid must be accompanied by a certified bank check of the Bidder, or a Bid Bond prepared by a surety company licensed in New York State.

1. Bid Security shall be provided in the amount of five (5) percent of the dollar amount of the Base Bid.
2. Bid Security shall be payable to Newburgh Enlarged City School District.
3. If certified check is utilized, the Bidder shall provide written confirmation from a licensed New York State Surety company that Performance and Payment Bonds will be available to said Bidder for this Project.
4. The apparent low Bidders, upon failure or refusal to furnish the required Performance and Payment Bonds and execute a Contract within five (5) calendar days after receipt of notice of the acceptance of Bid, shall forfeit the Bid Security as liquidated damages for such failure or refusal, and not as a penalty.
5. The successful Bidders shall have the Bid Security returned upon execution of an Owner/Contractor Agreement.
6. Unsuccessful Bidders shall have their Bid Security returned following the execution of the Owner/Contractor Agreements or the forty-five (45) day period following the Bid Opening, whichever occurs first.
7. The Bid Security shall not be forfeited to the Owner in the event the Owner fails to comply with subparagraph 6.2.

B. Surety Bond shall be written on AIA Document A310, Bid Bond, and the attorney-in-fact that executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.

C. The Owner will have the right to retain the Bid Security of Bidders to whom an award is being considered until either:

1. The Contract has been executed and bonds, when required, have been furnished, or;
2. The specified time has elapsed so that Bids may be withdrawn or;
3. All Bids have been rejected.

4.3 SUBMISSION OF BIDS

A. All copies of the Bid, the Bid Security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name, and address and, if applicable, the designated Contract for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

1. If Bidder submits for different Contracts, each shall be submitted individually and so labeled for that Contract.

B. Bids shall be deposited at the designated location prior to the time and date indicated in the Invitation to Bidders for the receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

1. The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.
2. Oral, telephonic, telegraphic, facsimile, or other electronically transmitted Bids will not be considered.

C. Bids not exhibiting original signatures or seals will not be accepted as a responsive Bid.

D. Bids shall be submitted in duplicate. Executed forms required for each submitted Bid are as follows to be considered a complete bid:
1. 004116 Bid Form- all costs are to be filled out.
2. 004313 Bid Bond- A310.
3. 004325 Substitution list.
4. 004336 Proposed Subcontractors Form.

5. 004513 Contractor's Qualification Statement – AIA Document 305, 2020 edition.
6. 004519 Non-Collusive Bid Certification.
7. 004520 Iran Divestment Act Certification.
8. 004521 Understanding of Agreement
9. 004522 Proposer Warranties.
10. 004523 Sexual Harassment Certifications.
11. 004543 Corporate Resolution.
12. 004544 Insurance Affidavit.
13. 012200 Unit prices.
14. 012300 Alternates.

4.4 MODIFICATION OR WITHDRAWAL OF BID

A. A Bid may not be modified, withdrawn, or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid. No Bidder may withdraw a Bid within the forty-five (45) day period following the time of the Bid Opening or be subject to forfeiture of the bid security.

B. Prior to the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder. Written confirmation over the signature of the Bidder shall be received, and date and time-stamped by the receiving party on or before the date and time set for receipt of Bids. A change shall be so worded as not to reveal the amount of the original Bid.

C. Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

D. Negligence on the part of the Bidder in preparing its Bid confers no right for the withdrawal of the Bid after it has been opened. If a Bidder claims to have made a mistake or error in its Bid, it shall deliver to the Architect within three (3) days after the Bid Opening, a written notice describing in detail the nature of the claimed mistake or error with documentary evidence or proof (including, but not limited to, bid worksheets, summary sheets and other bid related data requested of it). Failure to deliver notice and evidence or proof specified above within the specified time shall constitute a waiver of the Bidder's right to claim an error or mistake. Upon receipt of specified notice and evidence or proof within the specified time period, the Architect and Owner shall determine if an excusable error or mistake has been made; and, if so, the Owner may permit the Bid to be

withdrawn. The Owner's determination of whether a Bidder made an excusable error or mistake shall be conclusive on the Bidder, its Surety, and all the claim rights under the Bidder.

PART 5 – CONSIDERATION OF BIDS

5.1 OPENING OF BIDS

A. The properly identified Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids may be made available to Bidders. The Owner reserves the right to postpone the date and time of the opening of Bids at any time prior to the date and time listed in the Advertisement or Invitation to Bid.

5.2 REJECTION OF BIDS

A. The Owner shall maintain the right to reject any or all Bids. A Bid not accompanied by the required Bid Security or by other data required by the Bidding Documents, or which is in any way incomplete, or irregular is subject to rejection.

B. If identical bids are received and these bids are or become the low Bids, the Owner reserves the right to award the Contract on the basis of the relative quality of the product or products as shown by similar work done elsewhere, and it is mutually agreed that the Owner's judgment shall be final.

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

D. The Owner reserves unto itself the sole right to determine the lowest qualified and responsible Bidder. The Owner may make any investigation necessary to determine the ability of the Bidder to fulfill the Contract and the Bidder shall

furnish the Owner with all such information for this purpose as the Owner may request. Without limiting the general rights which the Owner has to reject Bids, as herein before set forth, in determining the lowest responsible Bidder, the following considerations in addition to those above mentioned will be taken into account. In determining the responsibility of a Bidder for a public works contract, the Owner shall consider whether the Bidder:

1. Maintains a permanent place of business;
2. Has adequate plant and equipment to do the Work properly and expeditiously;
3. Has the suitable financial ability to meet obligations required by the Work;
4. Has appropriate technical ability and experience in institutional and commercial construction including experience in K-12 public school construction in New York State;
5. Has performed Work of the same general type and the same scale called for under this Contract;
6. Has previously failed to perform contracts properly or complete them on time;
7. Is in a position to perform this Contract;
8. Has habitually and without just cause neglected the payment of bills or otherwise disregarded its obligations to subcontractors, suppliers, or employees;
9. Is eligible for full bonding capacity of its Contract;
10. Has been in business as the corporation, partnership, sole proprietorship or other business entity, in whose name the bid is submitted, continuously, for no less than the previous five (5) years performing or coordinating the Work which they are bidding on;
11. Is not currently involved in bankruptcy proceedings;
12. Is licensed to perform the Work it is bidding on in the jurisdiction the work will take place;
13. Is able to perform the work with manpower available to it;
14. Will employ a field superintendent with at least five (5) years' experience as a working field superintendent and capable of communicating in fluent English;
15. Has committed a willful violation of the New York State Prevailing Wage Laws within the last five years;
16. Has committed violations of safety and/or training standards as evidenced by a pattern of OSHA violations or the existence of willful OSHA violations;
17. Has committed any significant violation of the Worker's Compensation Law, including, but not limited to, the failure of the bidder to provide proof of worker's compensation or disability benefits coverage;

18. Has committed any criminal conduct involving violations of the Environmental Conservation Law or other federal or state environmental statutes of regulations;
19. Has committed any criminal conduct concerning formation of, or any business association with, an allegedly false or fraudulent Women's or Minority Business Enterprise (W/MBE), or any denial, decertification, revocation or forfeiture of W/MBE status by New York State;
20. Has been debarred by any agency of the U.S. Government; and
21. Has engaged in other conduct of so serious or compelling a nature that it raises questions about the responsibility of the bidder, including, but not limited to submission to the Owner of a false or misleading Statement of Bidder's Qualifications, or in some other form, in connection with a bid for or award of a contract.

5.3 AWARD OF BID

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

B. The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

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

PART 6 – POST-BID INFORMATION

6.1 CONTRACTOR'S QUALIFICATION STATEMENT

A. Bidders to submit with their bid package, a properly executed AIA Document A305, Contractor's Qualification Statement.

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

6.2 SUBMITTALS

A. Within three (3) calendar days following the Bid Opening time, the apparent lowest Bidder, shall furnish to the Owner through the Architect the following information:
1. Labor rate sheet
2. Material and Equipment List.
3. Schedule of Values.
4. Proposed Project Manager with Resume with NYSED experience.
5. Subcontractor List.
6. Itemized Identification of Work to be Self-Performed.
7. Substitution List.

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

C. Upon request only, the apparent second and third low Bidders shall be prepared to submit the information of paragraphs 6.1 and 6.2.A.

D. Prior to the execution of the Contract, the Construction Manager will notify the Bidder in writing if either the Owner, Architect/Engineer, or Construction Manager, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner, Architect or Construction Manager has reasonable objection to a proposed person or entity, the Bidder may, at the

Bidder's option, (1) withdraw the Bid or (2) submit an acceptable substitute person or entity. In the event of withdrawal or disqualification, Bid Security will not be forfeited.

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

F. Any Bidder, upon failure to submit the information required in subparagraphs 6.1.A, 6.2.A, and 6.2.B in the allowed time, may have the Bid rejected. In that event, the Bidder shall forfeit the Bid Security to the Owner as liquidated damages for such failure or refusal, and not as penalty.

6.3 INSURANCE

A. The Owner requires the apparent successful Bidder to provide insurance from a company licensed and admitted in New York State, NO EXCEPTIONS.

B. Contractors are to refer to Specification Section 007216 AIA 232 General Conditions Article 11 for additional insurance requirements.

C. Verification of ability to provide such coverages required from licensed and admitted carriers must be submitted with your bid.

6.4 BOND REQUIREMENTS

A. The Owner requires the apparent successful Bidder to furnish and deliver bonds, covering the faithful performance of the Contract Work and payment of all obligations arising thereunder duly executed by the Bidder and a surety company licensed to do business in New York State and have an AM Best rating.

B. The premiums shall be included in the Bid and paid by the Contractor. The Bidder shall proportionally distribute the costs of such bonds between the Base Bid and any Alternates.

6.5 TIME OF DELIVERY AND FORM OF BONDS

A. The Bidder shall deliver the required bonds to the Owner through the Construction Manager on or before the time of execution of the Owner/Contractor Agreement. Bonds shall be payable to Newburgh Enlarged City School District

B. Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond, Version 2010. Both bonds shall be written in the amount of the Contract Sum.

C. The bonds shall be dated the same as the Owner/Contractor Agreement.

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

E. The surety for the performance and payments bonds shall be a duly authorized surety company, licensed to do business in the State of New York, and listed in the latest issue of U.S. Treasury Circular 570. The sufficiency of the surety and the bonds is subject to the approval of the Owner, and sureties and bonds that are deemed insufficient by the Owner may be rejected.

PART 7 – AGREEMENT FORM BETWEEN OWNER AND CONTRACTOR

A. Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition – AIA Document A132-2019 Edition, as modified.

END OF DOCUMENT 002113

SECTION 003100 – PROJECT FORMS AND RELATED DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section lists the project forms used for administration of the project as well as documents used for administration and logistics

1.3 FORMS

A. The following forms are contained within the conditions of the contract section:
   1. SUBMITTAL LOG
   2. SUBMITTAL COVER
   3. REQUEST FOR INFORMATION (RFI)
   4. SUBSTITUTION REQUEST FORM

PART 2 -PRODUCTS (Not Applicable)

PART 3 - EXECUTION

1.4 PROCEDURES

A. LCS CONTRACTOR PREQUALIFICATION STATEMENT: A list of Company, staff, M/WBE Subcontracts, Management Identification, Financial Information, etc. to help with determination of capabilities.

B. SITE SPECIFIC SAFETY PLAN: How Contractor will address requirements for on-site safety.

C. SUBMITTAL LOG: A list of the submissions required. Refer to BIDDING REQUIREMENTS, Section entitled “INSTRUCTIONS TO BIDDERS” and Division 1, and Specification Section entitled “SUBMITTAL PROCEDURES” for submission procedures.

D. REQUEST FOR INFORMATION (RFI) FORM: This form is to be used for information requests. The form is to be filled out by any party to the contract and sent to the Architect. The Architect will number the RFI before processing.

E. SUBMITTAL COVER: The form is to be filled out by the Prime Contractor for each submittal and sent to the Architect in accordance with Division 01 Section “SUBMITTAL PROCEDURES”.

F. SUBSTITUTION REQUEST FORM: This document is to be used by a Prime Contractor to propose a substitution in accordance with Division 01Section “SUBSTITUTION PROCEDURES”.

G. CONTRACTOR CLOSE-OUT DOCUMENTATION CHECKLIST: This document is to be used by a Prime Contractor to Facilitate Close-Out procedures in accordance with Division 01 Section "CLOSEOUT PROCEDURES."

END OF SECTION 003100

DOCUMENT 003113 - PRELIMINARY SCHEDULES

1.1 PROJECT SCHEDULE

A. This Document is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information, but do not affect Contract Time requirements. This Document and its attachments are not part of the Contract Documents.

B. This project is scheduling to be completed including closeout within ten (10) months of Contract award and/or Notice to Proceed letter. Refer to Multiple Contract Summary Section 011200 for further information.

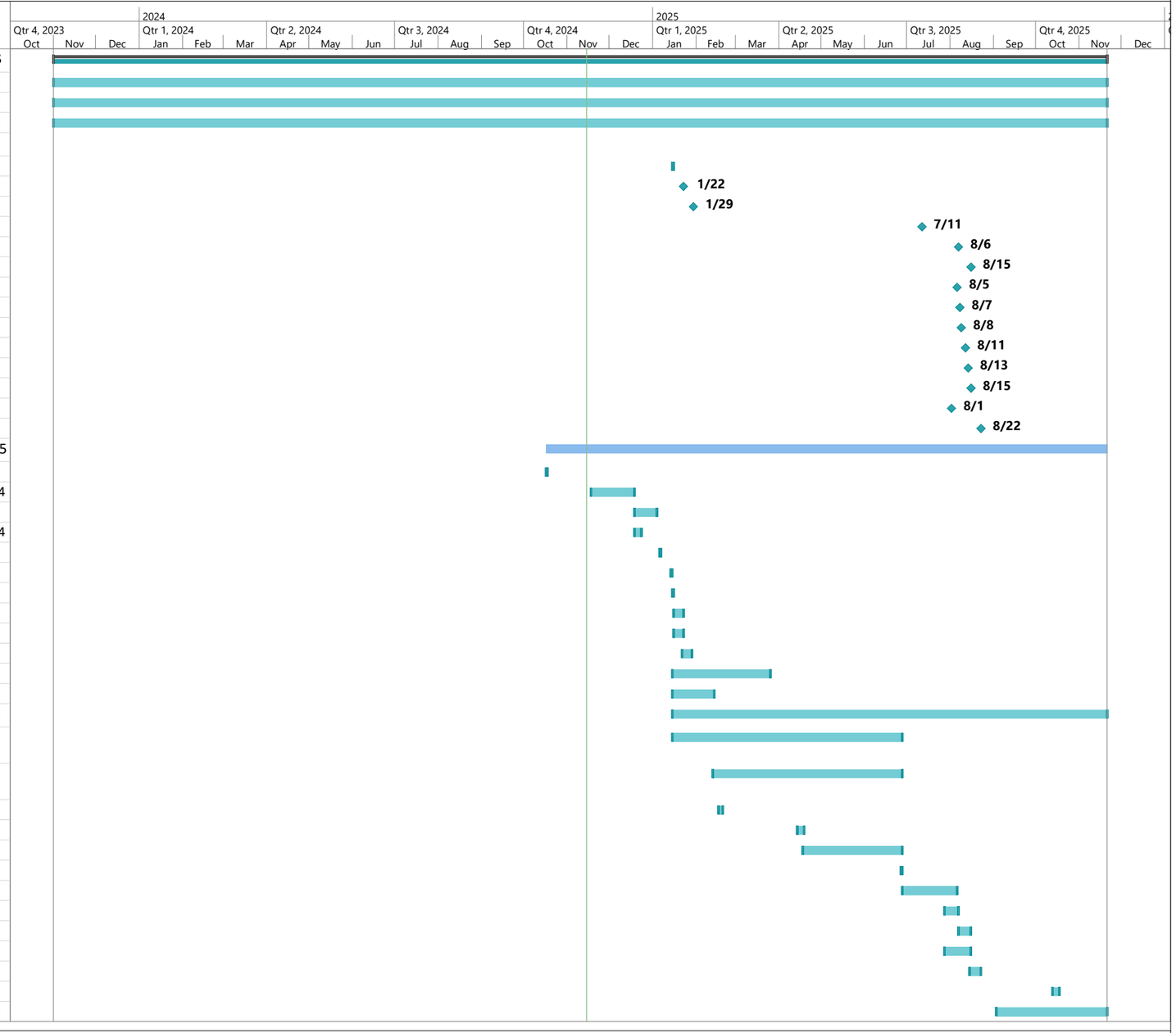
No work shall be done during normal school hours unless otherwise permitted by the District or as stated in Multiple Contract Summary Section 011200. It is expected second shift work will occur from January 2025 through June 2025 to prepare for equipment installation, start up, commissioning and controls programming to be completed in Summer 2025. Requests to work outside of the district's standard staff hours must be made one week in advance.

END OF DOCUMENT 003113

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Newburgh Enlarged City School District
Prop 5
HVAC & Elect Service Upgrades
Updated Projected Schedule

ID	Task Mode	Task Name	Duration	Start	Finish
1		**Phase 1 Summer 2024 & 2025**	**751 days?**	**Wed 11/1/23**	**Thu 11/20/25**
2		**Gidney Avenue Elementary School**	751 days	Wed 11/1/23	Thu 11/20/25
3		**Meadow Hill GEM School**	751 days	Wed 11/1/23	Thu 11/20/25
4		**Temple Hill Academy**	751 days	Wed 11/1/23	Thu 11/20/25
5		**Project Milestones**			
6		Anticipated Notice to Proceed	1 day	Wed 1/15/25	Wed 1/15/25
7		Complete Submission of Long Lead Submittals	1 day	Wed 1/22/25	Wed 1/22/25
8		Complete Order Long Lead Mechanical Material	1 day	Wed 1/29/25	Wed 1/29/25
9		Abatement Completion at Meadow Hill Gem School & Temple Hill Acade	1 day	Fri 7/11/25	Fri 7/11/25
10		Gidney Avenue Elementary School Phase 1 Completion	1 day	Wed 8/6/25	Wed 8/6/25
11		Gidney Avenue Elementary School Phase 2 Completion	1 day	Fri 8/15/25	Fri 8/15/25
12		Meadow Hill GEM School and Temple Hill Academy Phase 1 Completion	1 day	Tue 8/5/25	Tue 8/5/25
13		Meadow Hill GEM School and Temple Hill Academy Phase 2 Completion	1 day	Thu 8/7/25	Thu 8/7/25
14		Meadow Hill GEM School and Temple Hill Academy Phase 3 Completion	1 day	Fri 8/8/25	Fri 8/8/25
15		Meadow Hill GEM School and Temple Hill Academy Phase 4 Completion	1 day	Mon 8/11/25	Mon 8/11/25
16		Meadow Hill GEM School and Temple Hill Academy Phase 5 Completion	1 day	Wed 8/13/25	Wed 8/13/25
17		Meadow Hill GEM School and Temple Hill Academy Phase 6 Completion	1 day	Fri 8/15/25	Fri 8/15/25
18		Unit Ventilator Installation Complete at All Schools	1 day	Fri 8/1/25	Fri 8/1/25
19		All Schools Construction Completion- Turnover of School back to District	1 day	Fri 8/22/25	Fri 8/22/25
20		**Mechanical Upgrades**	400 days	Thu 10/17/24	Thu 11/20/25
21		Phase 1 SED Approval	1 day	Thu 10/17/24	Thu 10/17/24
22		Phase 1 Bid Advertisement/Bidding	31 days	Mon 11/18/24	Wed 12/18/24
23		SED Project Level Bids- Award	16 days	Thu 12/19/24	Fri 1/3/25
24		Apparent Low Bidder Submission Documents	5 days	Thu 12/19/24	Mon 12/23/24
25		Letter of Recommendation	1 day	Mon 1/6/25	Mon 1/6/25
26		Anticipated BOE Approval	1 day	Tue 1/14/25	Tue 1/14/25
27		Anticipated NECSD Notice to Proceed	1 day	Wed 1/15/25	Wed 1/15/25
28		Project Front End Submittals	7 days	Thu 1/16/25	Wed 1/22/25
29		Long lead Mechanical Equipment Submittals Due	7 days	Thu 1/16/25	Wed 1/22/25
30		Long lead Mechanical Equipment Review and Approval	7 days	Wed 1/22/25	Tue 1/28/25
31		Approved Submittals & Shop Drawings	70 days	Wed 1/15/25	Tue 3/25/25
32		Projected Contract Review and Execution by NECSD	30 days	Wed 1/15/25	Thu 2/13/25
33		**Gidney Avenue Elementary School**	310 days	Wed 1/15/25	Thu 11/20/25
34		Anticipated Construction can begin as soon as notice to proceed is issued. All work can begin on Second Shift work throughout the School year	164 days	Wed 1/15/25	Fri 6/27/25
35		Rough- In Mechanical and Electrical work, Overhead & Horizontal Piping to Unit Ventilators, Piping Enclosures, & Replacement Ceiling Tile	135 days	Thu 2/13/25	Fri 6/27/25
36		Winter Vacation 1st Shift Work	3 days	Mon 2/17/25	Wed 2/19/25
37		Spring Break - Proposed Concrete Pad Work Gidney 1st Shift	5 days	Mon 4/14/25	Fri 4/18/25
38		Fencing/Condensers Installed on Concrete Pads	71 days	Fri 4/18/25	Fri 6/27/25
39		Last Day of School June 27th 2025	1 day	Fri 6/27/25	Fri 6/27/25
40		Remove existing and Install New Unit Ventilators	39 days	Sat 6/28/25	Tue 8/5/25
41		Completion of Phase 1	10 days	Mon 7/28/25	Wed 8/6/25
42		Completion of Phase 2	9 days	Thu 8/7/25	Fri 8/15/25
43		Punchlist Work	19 days	Mon 7/28/25	Fri 8/15/25
44		Final Completion of Construction Work Including Cleaning, Commissioning	8 days	Fri 8/15/25	Fri 8/22/25
45		Winter Commissioning	5 days	Mon 10/13/25	Fri 10/17/25
46		Closeout	79 days	Wed 9/3/25	Thu 11/20/25



Project R2 R1- Prop 5 design-s
Date: Fri 11/15/24

Task · Split · Milestone · Summary · Project Summary · Inactive Task · Inactive Milestone · Inactive Summary · Manual Task · Duration-only · Manual Summary Rollup · Manual Summary · Start-only · Finish-only · External Tasks · External Milestone · Deadline · Progress · Manual Progress

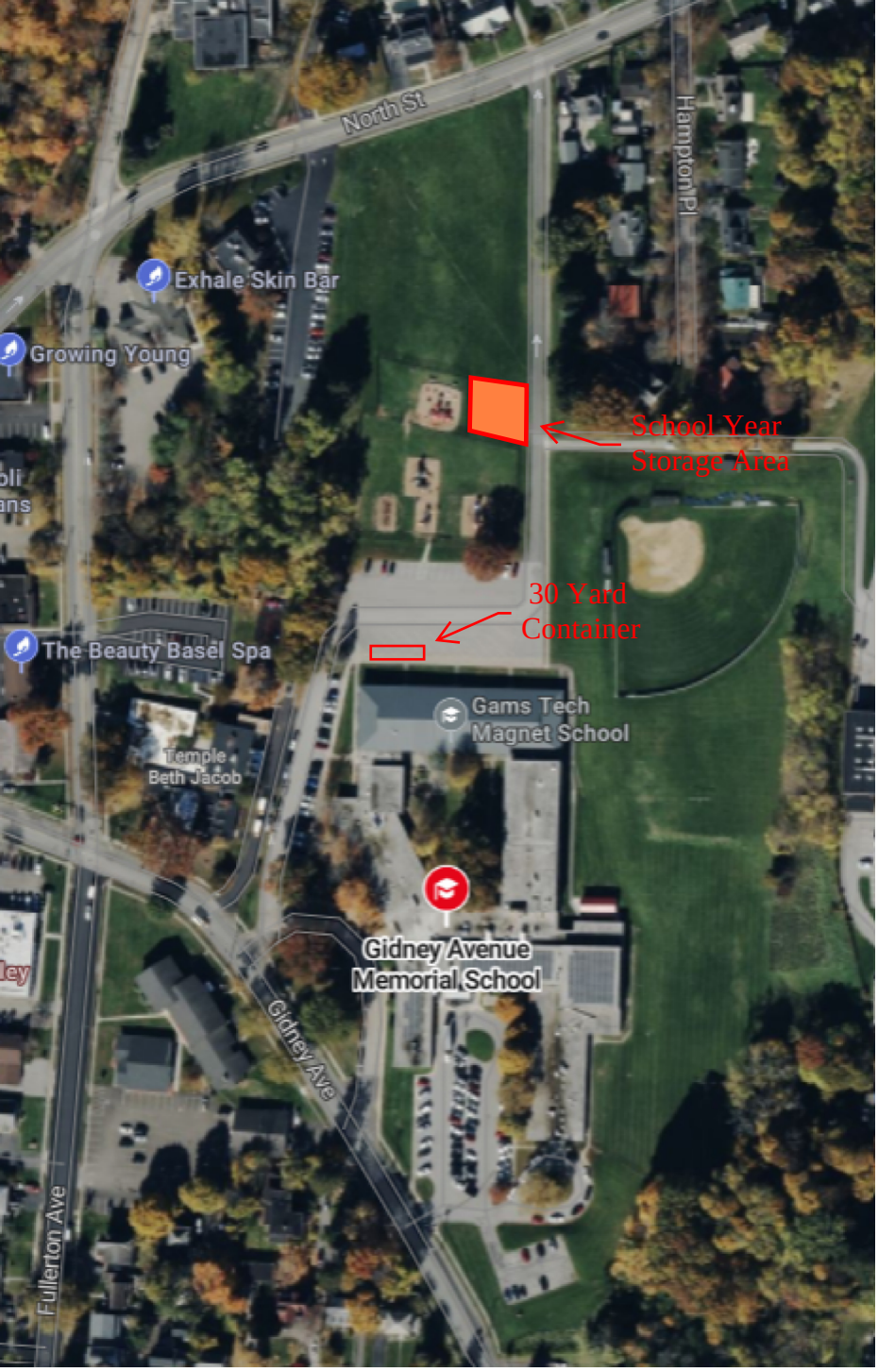
Newburgh Enlarged City School District
Prop 5
HVAC & Elect Service Upgrades
Updated Projected Schedule

ID	Task Mode	Task Name	Duration	Start	Finish
47		**Meadow Hill GEM School**	310 days	Wed 1/15/25	Thu 11/20/25
48		Anticipated Construction can begin as soon as notice to proceed is issued. Roughing can begin on Second Shift work throughout the School year	164 days	Wed 1/15/25	Fri 6/27/25
49		Rough- In Mechanical and Electrical work, Overhead & Horizontal Piping to Unit Ventilators, Piping Enclosures, & Replacement Ceiling Tile	135 days	Thu 2/13/25	Fri 6/27/25
50		Winter Recess 1st Shift Work	3 days	Mon 2/17/25	Wed 2/19/25
51		Electrical Shut Down During April Break	5 days	Mon 4/14/25	Fri 4/18/25
52		Concrete Pads During April Break	5 days	Mon 4/14/25	Fri 4/18/25
53		Fencing/Condensers Installed on Concrete Pads	71 days	Fri 4/18/25	Fri 6/27/25
54		Last Day of School June 27th 2025 - Abatement can start after 4PM	1 day	Fri 6/27/25	Fri 6/27/25
55		Abatement Work	14 days	Sat 6/28/25	Fri 7/11/25
56		Vault Work, Roof Work, Exterior Work	35 days	Sat 6/28/25	Fri 8/1/25
57		Installing Unit Ventilators	19 days	Mon 7/14/25	Fri 8/1/25
58		Phase 1 Punchlist & Close Out	5 days	Fri 8/1/25	Tue 8/5/25
59		Phase 2 Punchlist & Close Out	3 days	Tue 8/5/25	Thu 8/7/25
60		Phase 3 Punchlist & Close Out	3 days	Wed 8/6/25	Fri 8/8/25
61		Phase 4 Punchlist & Close Out	5 days	Thu 8/7/25	Mon 8/11/25
62		Phase 5 Punchlist & Close Out	3 days	Mon 8/11/25	Wed 8/13/25
63		Phase 6 Punchlist & Close Out	3 days	Wed 8/13/25	Fri 8/15/25
64		Final Completion of Construction Work Including Cleaning, Commissioning - Turnover of School Back to District through Phasing Program	8 days	Fri 8/15/25	Fri 8/22/25
65		Winter Commissioning	5 days	Mon 10/13/25	Fri 10/17/25
66		Closeout	79 days	Wed 9/3/25	Thu 11/20/25
67		**Temple Hill Academy**	310 days	Wed 1/15/25	Thu 11/20/25
68		Anticipated Construction can begin as soon as notice to proceed is issued. Roughing can begin on Second Shift work throughout the School year	164 days	Wed 1/15/25	Fri 6/27/25
69		Rough- In Mechanical and Electrical work, Overhead & Horizontal Piping to Unit Ventilators, Piping Enclosures, & Replacement Ceiling Tile	135 days	Thu 2/13/25	Fri 6/27/25
70		Winter Recess 1st Shift Work	3 days	Mon 2/17/25	Wed 2/19/25
71		Proposed Concrete Pad Work 1st Shift, Exterior Electrical Vault/ Loading Dock Work	5 days	Mon 4/14/25	Fri 4/18/25
72		Fencing/Condensers Installed on Concrete Pads	71 days	Fri 4/18/25	Fri 6/27/25
73		Last Day of School June 27th 2025 - Abatement can start after 4PM	1 day	Fri 6/27/25	Fri 6/27/25
74		Abatement Work	14 days	Sat 6/28/25	Fri 7/11/25
75		Vault Work, Roof Work, Exterior Work	35 days	Sat 6/28/25	Fri 8/1/25
76		Installing Unit Ventilators	19 days	Mon 7/14/25	Fri 8/1/25
77		Proposed Electrical Shutdown	5 days	Mon 8/4/25	Fri 8/8/25
78		Phase 1 Punchlist & Close Out	5 days	Fri 8/1/25	Tue 8/5/25
79		Phase 2 Punchlist & Close Out	3 days	Tue 8/5/25	Thu 8/7/25
80		Phase 3 Punchlist & Close Out	3 days	Wed 8/6/25	Fri 8/8/25
81		Phase 4 Punchlist & Close Out	5 days	Thu 8/7/25	Mon 8/11/25
82		Phase 5 Punchlist & Close Out	3 days	Mon 8/11/25	Wed 8/13/25
83		Phase 6 Punchlist & Close Out	3 days	Wed 8/13/25	Fri 8/15/25
84		Final Completion of Construction Work Including Cleaning, Commissioning - Turnover of School Back to District through Phasing Program	8 days	Fri 8/15/25	Fri 8/22/25
85		Winter Commissioning	5 days	Mon 10/13/25	Fri 10/17/25
86		Closeout	79 days	Wed 9/3/25	Thu 11/20/25



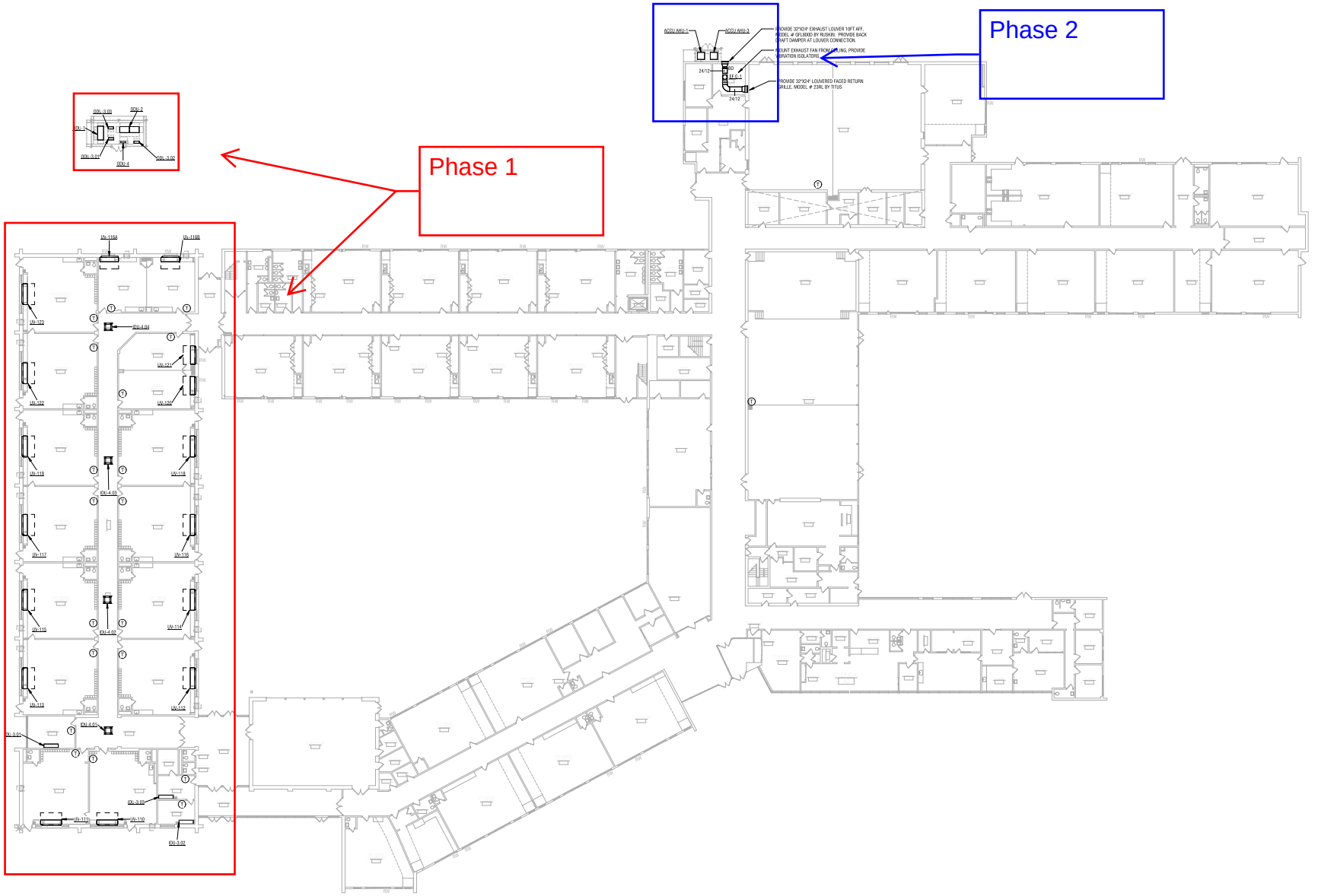
Project R2 R1- Prop 5 design-s
Date: Fri 11/15/24

Task | Split | Milestone | Summary | Project Summary | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | External Tasks | External Milestone | Deadline | Progress | Manual Progress


North St
Hampton Pl
Exhale Skin Bar
Growing Young
School Year
Storage Area
30 Yard
Container
The Beauty Basel Spa
Gams Tech
Magnet School
Temple
Beth Jacob
Gidney Avenue
Memorial School
Gidney Ave
Fullerton Ave

MECHANICAL NOTES:

1. CONTRACTOR TO CONFIRM DUCTWORK SIZE AND REPORT BACK TO ENGINEER
2. PROVIDE TEMPERATURE SENSOR AND TIE BACK TO BMS SYSTEM (TYP.)



1 M101 FIRST FLOOR MECHANICAL PLAN
1/16" = 1'-0"

GRAPHIC SCALE
SCALE: 1/16" = 1'-0"
0 16' 32' 48' 64'

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STATE OF NEW YORK — MICHAEL A. BRUNO — 069858 — LICENSED PROFESSIONAL ENGINEER
EXP: 07/24

CERTIFICATE OF AUTHORIZATION NUMBER:
PROFESSIONAL ENGINEERING: 018281 CORPORATE ENGINEERING
LAND SURVEYING: 017976 LICENSE NO. C-0430
GEOLOGICAL: 018750

It is a violation of New York Education Law Art. 145 Sec. 7209 & Art. 147 Sec. 7307, for any person, unless acting under the direction of a licensed architect, professional engineer, or land surveyor, to alter an item in any way. If an item bearing the seal of an architect, engineer, or land surveyor is altered, the altering architect, engineer, or land surveyor shall affix to the item their seal and notation "altered by" followed by their signature and date of such alteration, and a specific description of the alteration.

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NEWBURGH ENLARGED CITY SCHOOL DISTRICT
124 GRAND ST. - NEWBURGH, NY 12550

NEWBURGH ENLARGED CITY SCHOOL DISTRICT

GIDNEY AVENUE MEMORIAL SCHOOL
300 GIDNEY AVENUE
NEWBURGH, NY 12550

NO:	DATE:	DESCRIPTION:
Revisions		

S.E.D. NUMBER: 44-16-00-01-0-006-015
PROJECT NUMBER: 2233600
DRAWN BY: DRM
REVIEWED BY: MB
ISSUED FOR: NYSED ADDENDUM NO. 001
DATE: 07-08-2024
DRAWING NAME:

FIRST FLOOR DUCTWORK PLAN

DRAWING NUMBER:

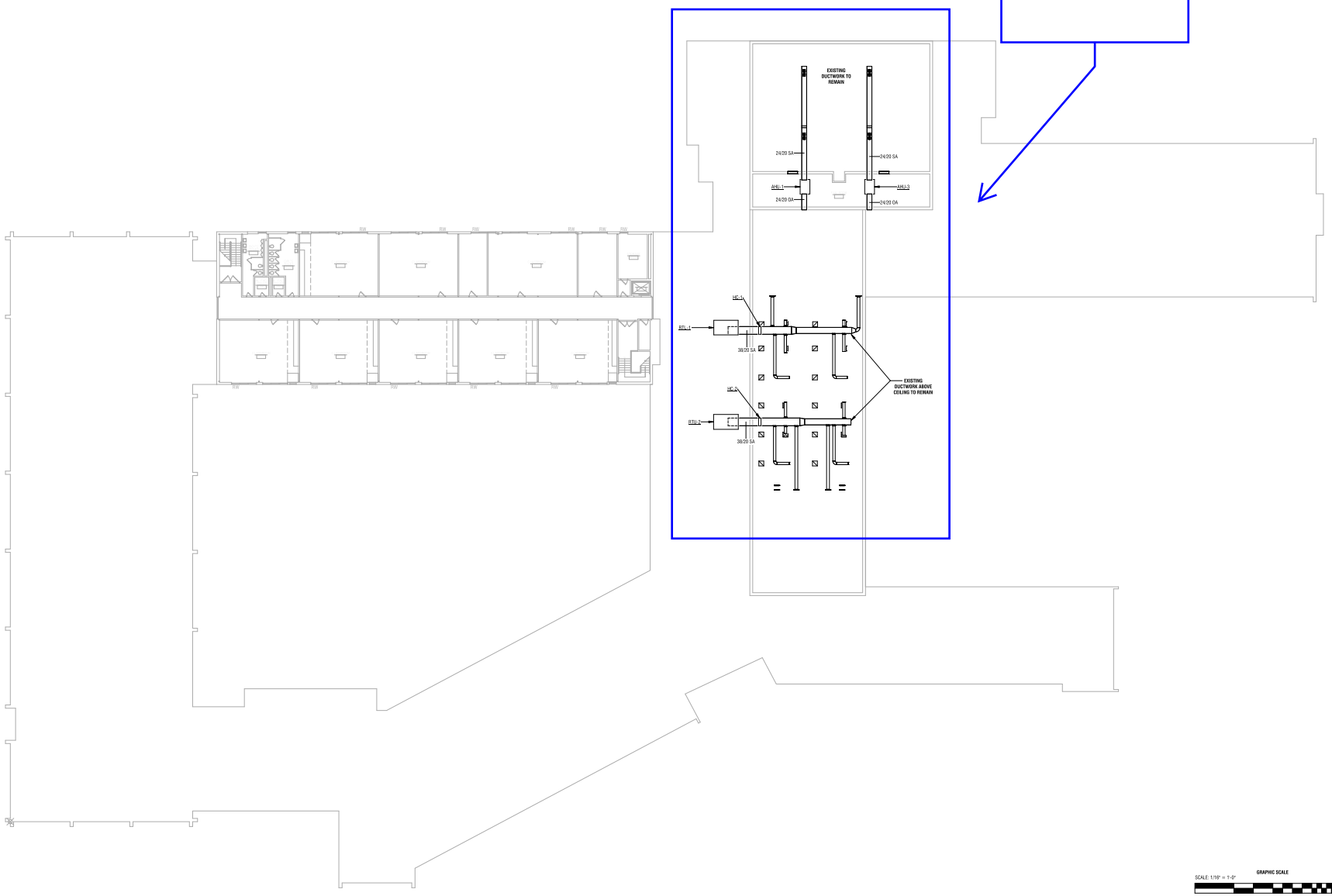
M101

7/10/2024 11:34:57 AM

MECHANICAL NOTES:

1. PROVIDE AHU AS SCHEDULED. RECONNECT TO EXISTING HWS/HWR PIPING ROUGH-INS. PROVIDE VALVES AND ACCESSORIES AS DETAILED. RECONNECT TO EXISTING DUCTWORK. PROVIDE REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS.

Phase 2



1 / M102 SECOND FLOOR MECHANICAL PLAN
1/16" = 1'-0"

SCALE: 1/16" = 1'-0"

GRAPHIC SCALE

0 16' 32' 48' 64'

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STATE OF NEW YORK — MICHAEL L. BUSH — 069659 — LICENSED PROFESSIONAL ENGINEER — EXP: 07/24

CERTIFICATE OF AUTHORIZATION NUMBER:
PROFESSIONAL ENGINEERING: 018281 CORPORATE ENGINEERING
LAND SURVEYING: 017976 LICENSE NO. C-0430
GEOLOGICAL: 018750

It is a violation of New York Education Law Art. 145 Sec. 7209 & Art. 147 Sec. 7307, for any person, unless acting under the direction of a licensed architect, professional engineer, or land surveyor, to alter an item in any way. If an item bearing the seal of an architect, engineer, or land surveyor is altered, the altering architect, engineer, or land surveyor shall affix to the item their seal and notation "altered by" followed by their signature and date of such alteration, and a specific description of the alteration.

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NEWBURGH ENLARGED CITY SCHOOL DISTRICT

GIDNEY AVENUE MEMORIAL SCHOOL
300 GIDNEY AVENUE
NEWBURGH, NY 12550

NO:	DATE:	DESCRIPTION:
Revisions		

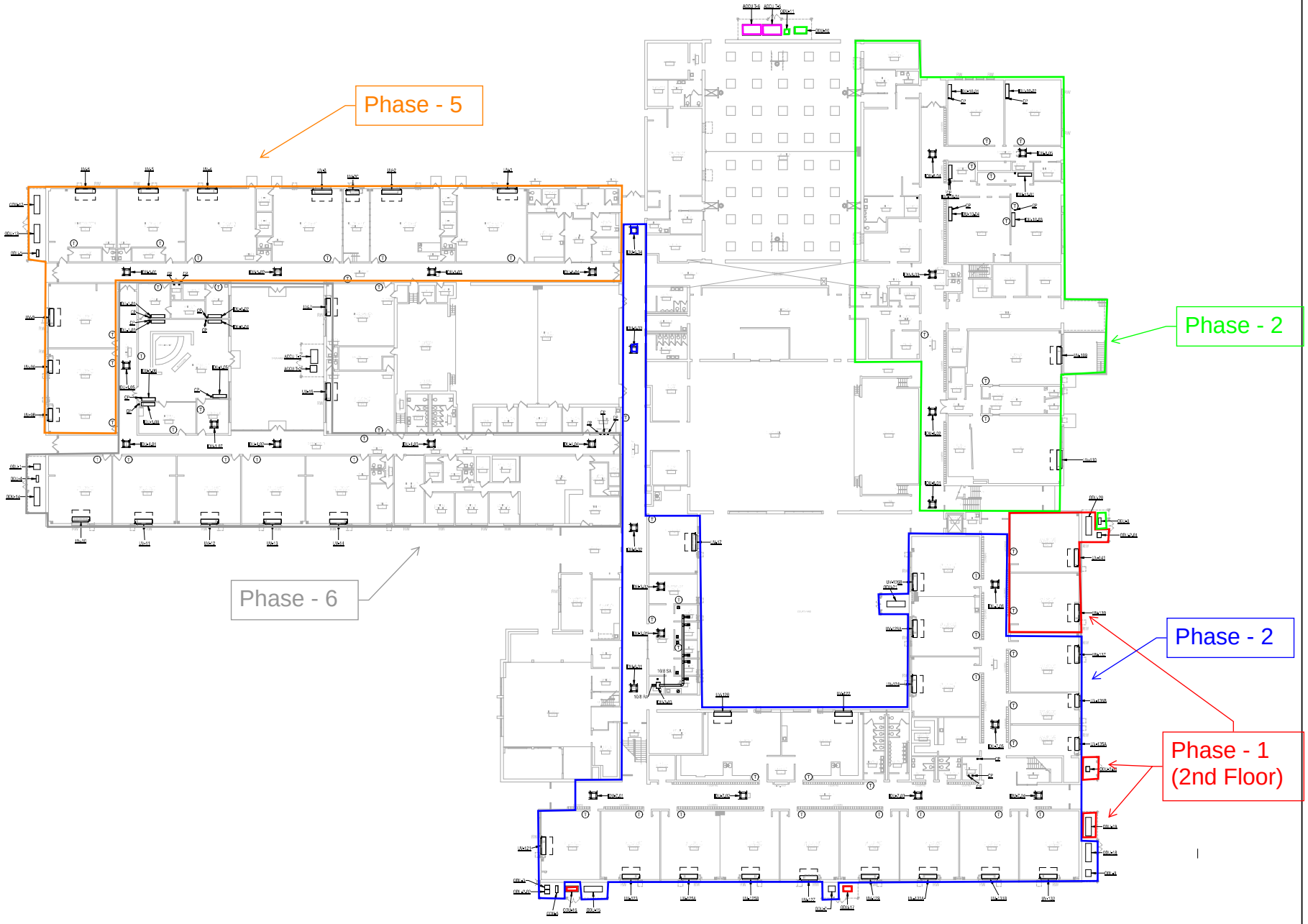
S.E.D. NUMBER: 44-16-00-01-0-006-015
PROJECT NUMBER: 2233600
DRAWN BY: DRM
REVIEWED BY: MB
ISSUED FOR: NYSED ADDENDUM NO. 001
DATE: 07-08-2024
DRAWING NAME:

SECOND FLOOR MECHANICAL PLAN

DRAWING NUMBER:

M102

7/10/2024 11:34:57 AM



MECHANICAL NOTES:

1. PROVIDE TEMPERATURE SENSOR AND TIE BACK TO BMS SYSTEM (TYP.).
2. RECONNECT AHUs TO EXISTING HW/S/HWR PIPING ROUGH-INS. PROVIDE VALVES AND ACCESSORIES AS DETAILED. RECONNECT TO EXISTING DUCTWORK. PROVIDE REFRIGERANT PIPING PER MANUFACTURER'S

FIRST FLOOR DUCTWORK PLAN
1/16" = 1'-0"

GRAPHIC SCALE
SCALE: 1/16" = 1'-0"
0 16" 32" 48" 64"

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STATE OF NEW YORK
MICHAEL A. BRUNO
090859
LICENSED PROFESSIONAL ENGINEER
EXP: 07/24

CERTIFICATE OF AUTHORIZATION NUMBER:
PROFESSIONAL ENGINEERING 018281
LAND SURVEYING 017976
REGIONAL 018710

It is a violation of New York Education Law Art. 145 Sec. 7209 & Art. 147 Sec. 7307, for any person, unless acting under the direction of a licensed architect, professional engineer, or land surveyor, to alter an item in any way. If an item bearing the seal of an architect, engineer, or land surveyor is altered, the altering architect, engineer, or land surveyor shall affix to the item their seal and notation "altered by" followed by their signature and date of such alteration, and a specific description of the alteration.

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NEWBURGH ENLARGED CITY SCHOOL DISTRICT
124 GRAND ST. - NEWBURGH, NY 12550

NEWBURGH ENLARGED CITY SCHOOL DISTRICT

MEADOW HILL GEM SCHOOL
124 MEADOW HILL ROAD
NEWBURGH, NY 12550

NO.	DATE:	DESCRIPTION:
Revisions		

SED CODE NUMBER: 444-504-041-000-014
PROJECT NUMBER: 2233600
DRAWN BY: DRM
REVIEWED BY: MB
ISSUED FOR: NYSED ADDENDUM NO. 001
DATE: 07-08-2024
DRAWING NAME:

FIRST FLOOR DUCTWORK PLAN

DRAWING NUMBER:

M101

7/10/2024 11:36:15 AM

MECHANICAL NOTES:

1. PROVIDE TEMPERATURE SENSOR AND TIE BACK TO BMS SYSTEM (TYP.).
2. PROVIDE AHU AS SCHEDULED, RECONNECT TO EXISTING HYDRONIC PIPING AS REQUIRED. PROVIDE VALVES AND ACCESSORIES AS DETAILED. RECONNECT TO EXISTING DUCTWORK. PROVIDE REFRIGERANT PIPING PER MANUFACTURER'S

KEY NOTES:

1. PROVIDE VOLUME DAMPER AT NECK OF EACH DIFFUSER.
2. REBALANCE EXISTING DIFFUSERS
3. PROVIDE IN-LINE TRUE MOUNTING SYSTEM TO HANG AHU FROM CEILING

Phase - 4

Phase - 1

EXISTING DUCTWORK TO REMAIN

1 M102 SECOND FLOOR MECHANICAL PLAN
1/16" = 1'-0"

GRAPHIC SCALE
SCALE: 1/16" = 1'-0"
0 16" 32" 48" 64"

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STATE OF NEW YORK — MICHAEL J. BERGIN — 069859 — LICENSED PROFESSIONAL ENGINEER — EXP. 07/24

CERTIFICATE OF AUTHORIZATION NUMBER:
PROFESSIONAL ENGINEERING 018281
LAND SURVEYING 017976
GEOLOGICAL 018150

It is a violation of New York Education Law Art. 145 Sec. 7209 & Art. 147 Sec. 7307, for any person, unless acting under the direction of a licensed architect, professional engineer, or land surveyor, to alter an item in any way. If an item bearing the seal of an architect, engineer, or land surveyor is altered, the altering architect, engineer, or land surveyor shall affix to the item their seal and notation "altered by" followed by their signature and date of such alteration, and a specific description of the alteration.

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NEWBURGH ENLARGED CITY SCHOOL DISTRICT
124 GRAND ST. - NEWBURGH, NY 12550

NEWBURGH ENLARGED CITY SCHOOL DISTRICT

MEADOW HILL GEM SCHOOL
124 MEADOW HILL ROAD
NEWBURGH, NY 12550

NO.	DATE:	DESCRIPTION:
Revisions		

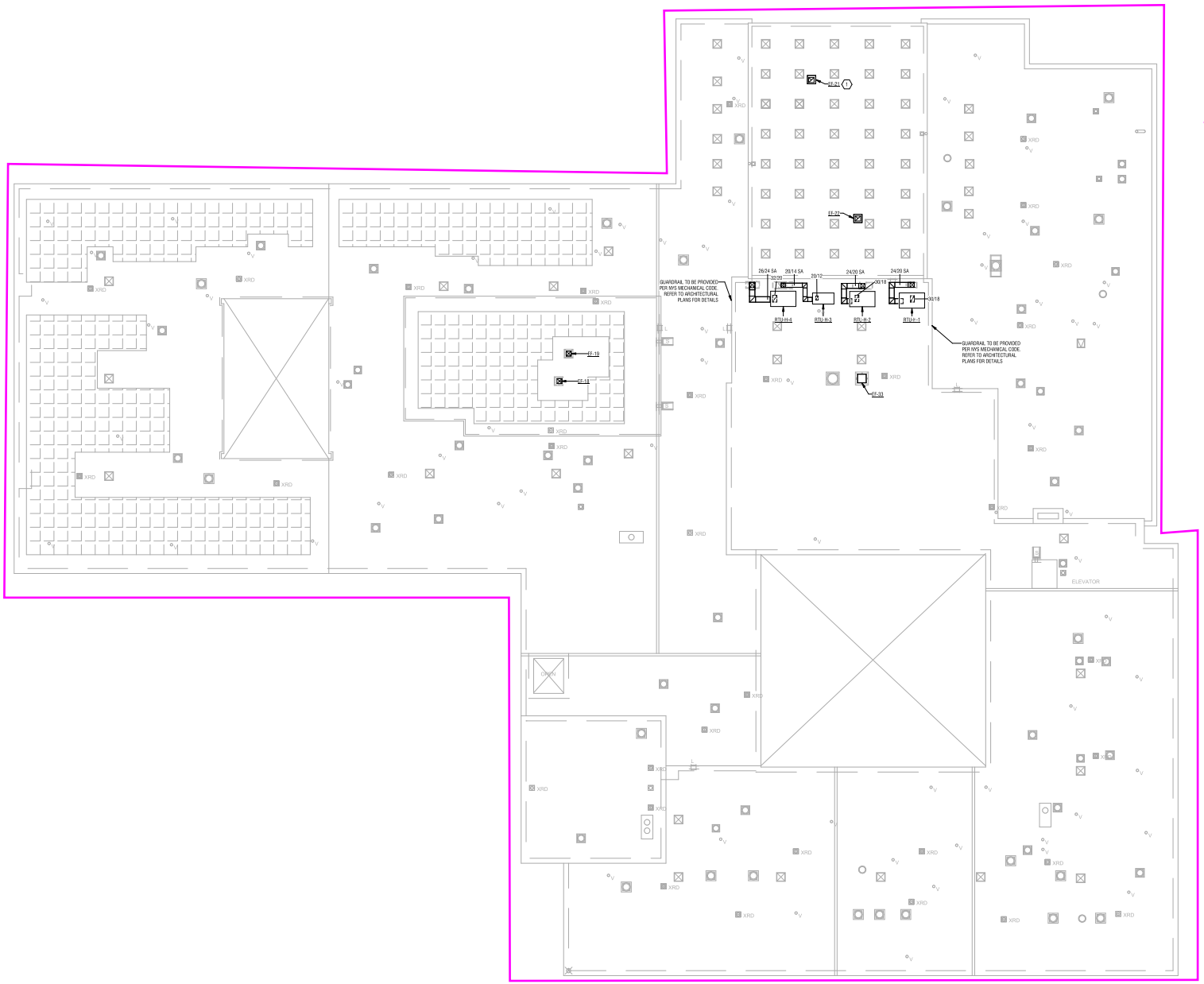
S/E/A NUMBER: 44-14-00-01-0-035-014
PROJECT NUMBER: 2233600
DRAWN BY: DRM
REVIEWED BY: MB
ISSUED FOR: NYSED ADDENDUM NO. 001
DATE: 07-08-2024
DRAWING NAME:

SECOND FLOOR DUCTWORK PLAN

DRAWING NUMBER:

M102

7/7/2024 11:36:16 AM



1 M103 ROOF MECHANICAL PLAN
1/16" = 1'-0"

SCALE: 1/16" = 1'-0"

GRAPHIC SCALE

0 16' 32' 48' 64'

10/30/2024 3:17:13 PM

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CERTIFICATE OF AUTHORIZATION NUMBER:
PROFESSIONAL ENGINEERING: 018281
LAND SURVEYING: 017976
GEOLOGICAL: 018750

It is a violation of New York Education Law Art. 145 Sec. 7209 & Art. 147 Sec. 7307, for any person, unless acting under the direction of a licensed architect, professional engineer, or land surveyor, to alter an item in any way. If an item bearing the seal of an architect, engineer, or land surveyor is altered, the altering architect, engineer, or land surveyor shall affix to the item their seal and notation "altered by" followed by their signature and date of such alteration, and a specific description of the alteration.

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NEWBURGH ENLARGED CITY SCHOOL DISTRICT

MEADOW HILL GEM SCHOOL
124 MEADOW HILL ROAD
NEWBURGH, NY 12550

NO.	DATE:	DESCRIPTION:
3	09-13-2024	ADDENDUM #3
2	9/3/2024	ADDENDUM#2
Revisions		

S.E.D. NUMBER: 44-16-00-01-0-005-014
PROJECT NUMBER: 2233600
DRAWN BY: DRM
REVIEWED BY: MB
ISSUED FOR: BID
DATE: 11/12/2024
DRAWING NAME: ROOF EQUIPMENT PLAN

DRAWING NUMBER:

M103

VRF HEAT PUMP INDOOR UNIT

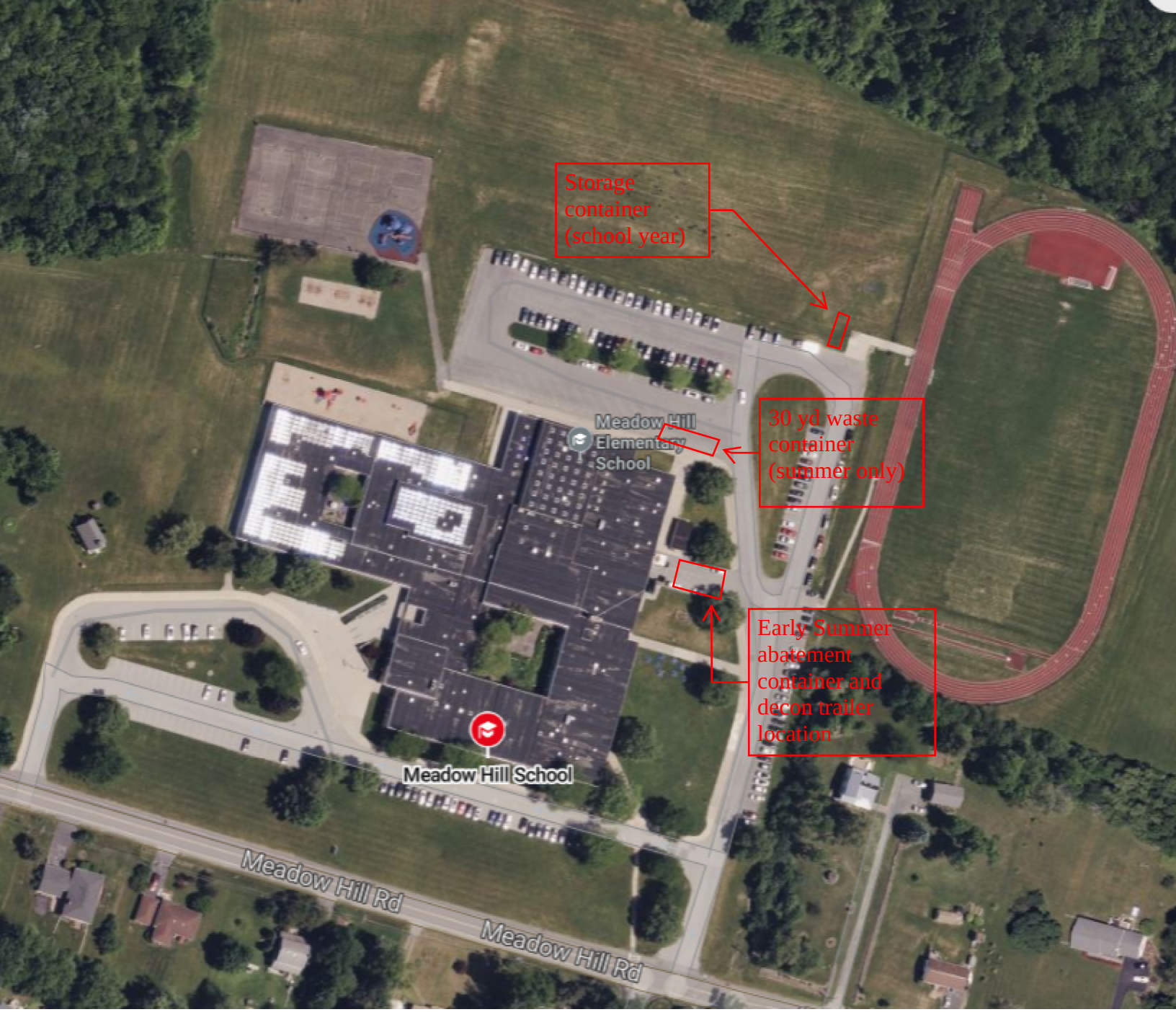
TAG	SERVED BY	TYPE	AIRFLOW (H/M/L)	HEATING CAPACITY (BTU/H)	TOTAL COOLING CAPACITY (BTU/H)	SENSIBLE COOLING CAPACITY (BTU/H)	DIMENSIONS (H X W X D)	WEIGHT (LBS)	VOLTAGE/PHASE	MCA	MOP	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	NOTES
EQ-1.01	ODU-1	WALL MOUNTED	290/160	8,700	7,500	6,000	11-3/8"X31-1/4"X9-1/4"	26	208V/1PH	0.3	15	DAIKIN	FXAQ07PVJU	1,2
EQ-1.02	ODU-1	WALL MOUNTED	290/160	8,700	7,500	6,000	11-3/8"X31-1/4"X9-1/4"	26	208V/1PH	0.3	15	DAIKIN	FXAQ07PVJU	1,2
EQ-1.03	ODU-1	WALL MOUNTED	290/180	14,000	12,000	8,700	11-3/8"X31-1/4"X9-1/4"	26	208V/1PH	0.4	15	DAIKIN	FXAQ12PVJU	1,2
EQ-1.04	ODU-1	WALL MOUNTED	290/180	14,000	12,000	8,700	11-3/8"X31-1/4"X9-1/4"	26	208V/1PH	0.4	15	DAIKIN	FXAQ12PVJU	1,2
EQ-1.05	ODU-1	WALL MOUNTED	290/180	14,000	12,000	8,700	11-3/8"X31-1/4"X9-1/4"	26	208V/1PH	0.4	15	DAIKIN	FXAQ12PVJU	1,2
EQ-1.06	ODU-1	WALL MOUNTED	290/180	14,000	12,000	8,700	11-3/8"X31-1/4"X9-1/4"	26	208V/1PH	0.4	15	DAIKIN	FXAQ12PVJU	1,2
EQ-1.07	ODU-1	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-1.08	ODU-1	WALL MOUNTED	290/160	8,700	7,500	6,000	11-3/8"X31-1/4"X9-1/4"	26	208V/1PH	0.3	15	DAIKIN	FXAQ07PVJU	1,2
EQ-2.01	ODU-2	WALL MOUNTED	434/311/247	13,400	13,300	10,600	11-1/4" X 30-5/16" X 8-3/4"	18	208V/1PH	0.4	15	DAIKIN	FTX12NMVJU	1,2
EQ-2.02	ODU-2	WALL MOUNTED	434/311/247	13,400	13,300	10,600	11-1/4" X 30-5/16" X 8-3/4"	18	208V/1PH	0.4	15	DAIKIN	FTX12NMVJU	1,2
EQ-2.03	ODU-2	WALL MOUNTED	434/311/247	13,400	13,300	10,600	11-1/4" X 30-5/16" X 8-3/4"	18	208V/1PH	0.4	15	DAIKIN	FTX12NMVJU	1,2
EQ-3.01	ODU-3	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-3.02	ODU-3	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-3.03	ODU-3	DUCTED CONCEALED	600/512/406	20,840	18,000	13,300	9-5/8"X21-11/16"X31-1/2"	77	208V/1PH	1.8	15	DAIKIN	FXSQ18TAVJU	
EQ-4.01	ODU-4	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-4.02	ODU-4	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-4.03	ODU-4	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-4.04	ODU-4	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-4.05	ODU-4	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-5.01	ODU-5	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-5.02	ODU-5	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-5.03	ODU-5	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-5.04	ODU-5	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-6.01	ODU-6	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-6.02	ODU-6	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-6.03	ODU-6	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-6.04	ODU-6	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-7.01	ODU-7	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-7.02	ODU-7	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-7.03	ODU-7	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-7.04	ODU-7	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-7.05	ODU-7	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-7.06	ODU-7	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-8.01	ODU-8	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-8.02	ODU-8	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-8.03	ODU-8	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-8.04	ODU-8	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-8.05	ODU-8	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-9.01	ODU-9	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-9.02	ODU-9	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-9.03	ODU-9	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-9.04	ODU-9	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-9.05	ODU-9	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-9.06	ODU-9	2X2 CASETTE	353/300/247	13,990	12,000	7,700	10-1/4" X 22-5/8" X 22-5/8"	36.4	208V/1PH	0.4	15	DAIKIN	FXZQ12TAVJU	2
EQ-10.01	ODU-10	WALL MOUNTED	635/470	26,500	24,000	18,000	10-1/4" X 22-5/8" X 22-5/8"	18	208V/1PH	0.4	15	DAIKIN	FXAQ24PVJU	1,2
EQ-10.02	ODU-10	WALL MOUNTED	635/470	26,500	24,000	18,000	10-1/4" X 22-5/8" X 22-5/8"	18	208V/1PH	0.4	15	DAIKIN	FXAQ24PVJU	1,2
EQ-10.03	ODU-10	WALL MOUNTED	635/470	26,500	24,000	18,000	10-1/4" X 22-5/8" X 22-5/8"	18	208V/1PH	0.4	15	DAIKIN	FXAQ24PVJU	1,2
EQ-10.04	ODU-10	WALL MOUNTED	635/470	26,500	24,000	18,000	10-1/4" X 22-5/8" X 22-5/8"	18	208V/1PH	0.4	15	DAIKIN	FXAQ24PVJU	1,2
EQ-10.05	ODU-10	WALL MOUNTED	635/470	8,500	7,500	6,300	10-1/4" X 22-5/8" X 22-5/8"	18	208V/1PH	0.4	15	DAIKIN	FXAQ07PVJU	1,2
EQ-11.01	ODU-11	WALL MOUNTED	316/247/182	N/A	12,000	10,900	10-1/4" X 22-5/8" X 22-5/8"	18	208V/1PH	0.4	15	DAIKIN	FTK12B	1,2

NOTES:

1. PROVIDE CONDENSATE PUMP
2. INTEGRATE INTO BACNET BMS SYSTEM (SEE CONTROLS DRAWINGS)

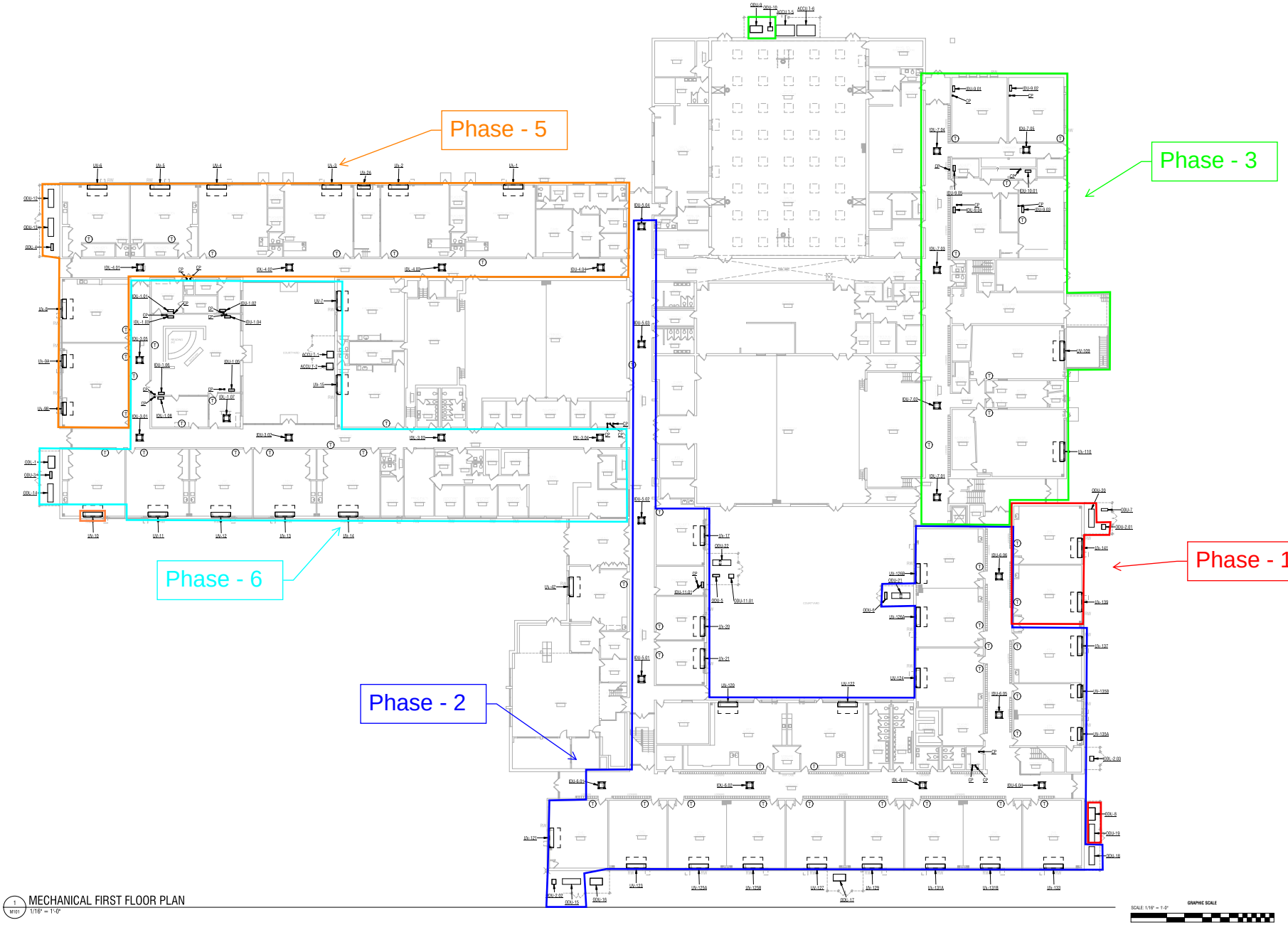
UNIT VENTILATOR

TAG	SERVED BY	SUPPLY FAN AIRFLOW (CFM)	SUPPLY FAN OA (CFM)	COOLING TOT. CAP (BTU/H)	COOLING SENS. CAP (BTU/H)	COOLING EAT DB (°F)	COOLING EAT WB (°F)	COOLING LAT DB (°F)	COOLING LAT WB (°F)	REFRIGERANT TYPE	HEATING TOT. CAP (BTU/H)	HEATING EAT DB (°F)	HEATING LAT (°F)	ELECTRICAL COIL ROWS	ELECTRICAL FLOW (GPM)	ELECTRICAL EWT (°F)	ELECTRICAL LWT (°F)	ELECTRICAL VOLT/Ø/PHASE	ELECTRICAL MCA (A)	ELECTRICAL MOCP (A)	UNIT SIZE L	UNIT SIZE W	UNIT SIZE H	WEIGHT (LB)	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	NOTES
UV-1	ODU-12	1500	500	50656	34148	80 °F	67 °F	58 °F	56 °F	R-410A	76026	47 °F	96 °F	2	2.0	180 °F	104 °F	208 V/60 Hz/1	4	15	98	22	33	600	DAIKIN APPLIED	UAV09V15	
UV-2	ODU-12	1500	500	50656	34148	80 °F	67 °F	58 °F	56 °F	R-410A	76026	47 °F	96 °F	2	2.0	180 °F	104 °F	208 V/60 Hz/1	4	15	98	22	33	600	DAIKIN APPLIED	UAV09V15	
UV-2C	ODU-12	750	210	25635	15482	80 °F	67 °F	61 °F	56 °F	R-410A	46057	51 °F	108 °F	2	2.0	180 °F	134 °F	208 V/60 Hz/1	4	15	62	22	33	370	DAIKIN APPLIED	UAV09V07	ALL
UV-3	ODU-12	1500	500	50656	34148	80 °F	67 °F	58 °F	56 °F	R-410A	76026	47 °F	96 °F	2	2.0	180 °F	104 °F	208 V/60 Hz/1	4	15	98	22	33	600	DAIKIN APPLIED	UAV09V15	
UV-4	ODU-12	1500	500	50656	34148	80 °F	67 °F	58 °F	56 °F	R-410A	76026	47 °F	96 °F	2	2.0	180 °F	104 °F	208 V/60 Hz/1	4	15	98	22	33	600	DAIKIN APPLIED	UAV09V15	
UV-5	ODU-13	1500	500	50656	34148	80 °F	67 °F	58 °F	56 °F	R-410A	76026	47 °F	96 °F	2	2.0	180 °F	104 °F	208 V/60 Hz/1	4	15	98	22	33	600	DAIKIN APPLIED	UAV09V15	
UV-6	ODU-13	1500	500	50656	34148	80 °F	67 °F	58 °F	56 °F	R-410A	76026	47 °F	96 °F	2	2.0	180 °F	104 °F	208 V/60 Hz/1	4	15	98	22	33	600	DAIKIN APPLIED	UAV09V15	
UV-7	ODU-14	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	ALL
UV-8	ODU-13	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-9A	ODU-13	750	210	25635	15482	80 °F	67 °F	61 °F	56 °F	R-410A	46057	51 °F	108 °F	2	2.0	180 °F	134 °F	208 V/60 Hz/1	4	15	62	22	33	370	DAIKIN APPLIED	UAV09V07	ALL
UV-9B	ODU-13	750	210	25635	15482	80 °F	67 °F	61 °F	56 °F	R-410A	46057	51 °F	108 °F	2	2.0	180 °F	134 °F	208 V/60 Hz/1	4	15	62	22	33	370	DAIKIN APPLIED	UAV09V07	ALL
UV-10	ODU-13	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-11	ODU-14	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-12	ODU-14	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-13	ODU-14	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-14	ODU-14	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-15	ODU-14	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-17	ODU-15	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	ALL
UV-109	ODU-20	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-110	ODU-20	1500	500	50656	34148	80 °F	67 °F	58 °F	56 °F	R-410A	76026	47 °F	96 °F	2	2.0	180 °F	104 °F	208 V/60 Hz/1	4	15	98	22	33	600	DAIKIN APPLIED	UAV09V15	
UV-120	ODU-15	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	ALL
UV-121	ODU-15	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-122	ODU-18	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	ALL
UV-123	ODU-15	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-124	ODU-21	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-125A	ODU-15	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-125B	ODU-15	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-126A	ODU-21	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-126B	ODU-21	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-127	ODU-18	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-129	ODU-18	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-131A	ODU-18	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-131B	ODU-18	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-133	ODU-18	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-136A	ODU-21	750	210	25635	15482	80 °F	67 °F	61 °F	56 °F	R-410A	46057	51 °F	108 °F	2	2.0	180 °F	134 °F	208 V/60 Hz/1	4	15	62	22	33	370	DAIKIN APPLIED	UAV09V07	ALL
UV-136B	ODU-21	750	210	25635	15482	80 °F	67 °F	61 °F	56 °F	R-410A	46057	51 °F	108 °F	2	2.0	180 °F	134 °F	208 V/60 Hz/1	4	15	62	22	33	370	DAIKIN APPLIED	UAV09V07	ALL
UV-137	ODU-21	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-139	ODU-20	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-141	ODU-20	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-220	ODU-17	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	ALL
UV-221	ODU-16	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-222	ODU-17	1500	500	50656	34148	80 °F	67 °F	58 °F	56 °F	R-410A	76026	47 °F	96 °F	2	2.0	180 °F	104 °F	208 V/60 Hz/1	4	15	98	22	33	600	DAIKIN APPLIED	UAV09V15	
UV-223	ODU-16	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-224	ODU-17	750	210	25635	15482	80 °F	67 °F	61 °F	56 °F	R-410A	46057	51 °F	108 °F	2	2.0	180 °F	134 °F	208 V/60 Hz/1	4	15	62	22	33	370	DAIKIN APPLIED	UAV09V07	ALL
UV-225	ODU-16	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-226	ODU-19	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-227	ODU-17	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-227A	ODU-16	1500	470	50656	34148	80 °F	67 °F	58 °F	56 °F	R-410A	76026	47 °F	96 °F	2	2.0	180 °F	104 °F	208 V/60 Hz/1	4	15	98	22	33	600	DAIKIN APPLIED	UAV09V15	
UV-228	ODU-20	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0	180 °F	129 °F	208 V/60 Hz/1	4	15	86	22	33	575	DAIKIN APPLIED	UAV09V13	
UV-229	ODU-17	1500	500	50656	34148	80 °F	67 °F	58 °F	56 °F	R-410A	76026	47 °F	96 °F	2	2.0	180 °F	104 °F	208 V/60 Hz/1	4	15	98	22	33	600	DAIKIN APPLIED	UAV09V15	
UV-231	ODU-19	1500	500	50656	34148	80 °F	67 °F	58 °F	56 °F	R-410A	76026	47 °F	96 °F	2	2.0	180 °F	104 °F	208 V/60 Hz/1	4	15	98	22	33	600	DAIKIN APPLIED	UAV09V15	
UV-233	ODU-19	1500	500	50656	34148	80 °F	67 °F	58 °F	56 °F	R-410A	76026	47 °F	96 °F	2	2.0	180 °F	104 °F	208 V/60 Hz/1	4	15	98	22	33	600	DAIKIN APPLIED	UAV09V15	
UV-235	ODU-19	1500	500	50656	34148	80 °F	67 °F	58 °F	56 °F	R-410A	76026	47 °F	96 °F	2	2.0	180 °F	104 °F	208 V/60 Hz/1	4	15	98	22	33	600	DAIKIN APPLIED	UAV09V15	ALL
UV-237A	ODU-19	750	210	25635	15482	80 °F	67 °F	61 °F	56 °F	R-410A	46057	51 °F	108 °F	2	2.0	180 °F	134 °F	208 V/60 Hz/1	4	15	62	22	33	370	DAIKIN APPLIED	UAV09V07	ALL
UV-237B	ODU-19	750	210	25635	15482	80 °F	67 °F	61 °F	56 °F	R-410A	46057	51 °F	108 °F	2	2.0	180 °F	134 °F	208 V/60 Hz/1	4	15	62	22	33	370	DAIKIN APPLIED	UAV09V07	ALL
UV-239	ODU-20	1250	420	40407	28022	80 °F	67 °F	59 °F	56 °F	R-410A	76598	41 °F	99 °F	2	2.0


Storage container (school year)
30 yd waste container (summer only)
Early Summer abatement container and decon trailer location
Meadow Hill Elementary School
Meadow Hill School
Meadow Hill Rd
Meadow Hill Rd

MECHANICAL NOTES:

1. PROVIDE TEMPERATURE SENSOR AND TIE BACK TO BMS SYSTEM (TYP.)
2. RECONNECT AHUs TO EXISTING HWS/HWR PIPING ROUGH-INS. PROVIDE VALVES AND ACCESSORIES AS DETAILED. RECONNECT TO EXISTING DUCTWORK. PROVIDE REFRIGERANT PIPING PER MANUFACTURERS



M101 MECHANICAL FIRST FLOOR PLAN
1/16" = 1'-0"

SCALE: 1/16" = 1'-0"
GRAPHIC SCALE
0 16' 32' 48' 64'

LaBella
Powered by partnership
4 British American Boulevard
Latham, NY 12110
(518) 273-0055
labellapc.com

STATE OF NEW YORK — MARK A. RUSH — 069653 — LICENSED PROFESSIONAL ENGINEER — EXP: 07/24

CERTIFICATE OF AUTHORIZATION NUMBER:
PROFESSIONAL ENGINEERING: 018281
LAND SURVEYING: 017976
GEOLOGICAL: 018750

It is a violation of New York Education Law Art. 145 Sec. 7209 & Art. 147 Sec. 7307, for any person, unless acting under the direction of a licensed architect, professional engineer, or land surveyor, to alter an item in any way. If an item bearing the seal of an architect, engineer, or land surveyor is altered, the altering architect, engineer, or land surveyor shall affix to the item their seal and notation "altered by" followed by their signature and date of such alteration, and a specific description of the alteration.

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NEWBURGH ENLARGED CITY SCHOOL DISTRICT
124 GRAND ST. - NEWBURGH, NY 12550

NEWBURGH ENLARGED CITY SCHOOL DISTRICT

TEMPLE HILL ACADEMY
525 UNION AVENUE
NEW WINDSOR, NY 12553

NO:	DATE:	DESCRIPTION:
Revisions		

S.E.D. NUMBER: 44-16-00-01-8-006-015
PROJECT NUMBER: 2233600
DRAWN BY: DRM
REVIEWED BY: MB
ISSUED FOR: NYSED ADDENDUM NO. 001
DATE: 07-08-2024
DRAWING NAME:

FIRST FLOOR DUCTWORK PLAN

DRAWING NUMBER:

M101

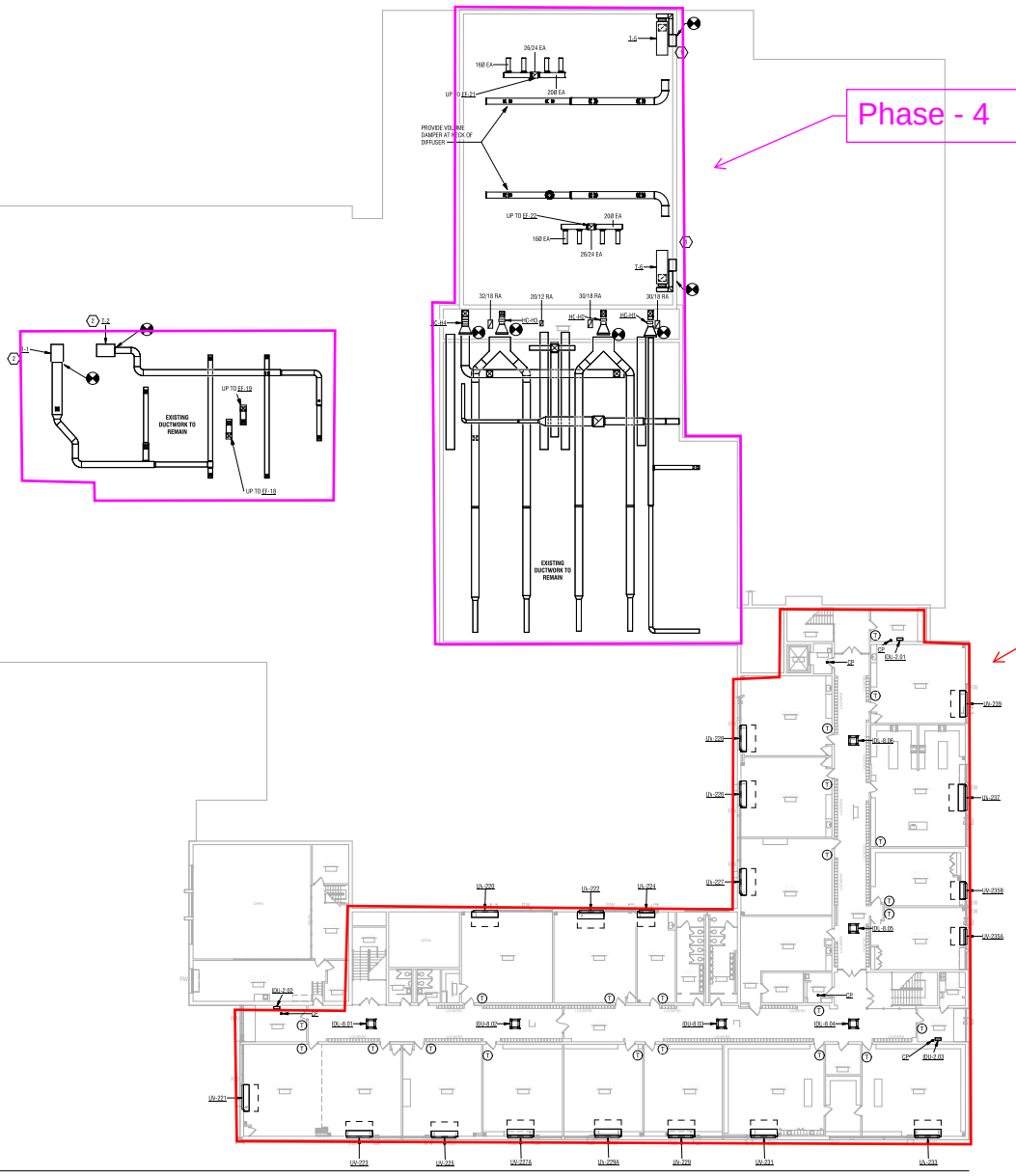
7/10/2024 11:27:09 AM

MECHANICAL NOTES:

1. PROVIDE TEMPERATURE SENSOR AND TIE BACK TO BMS SYSTEM (TYP.)
2. PROVIDE AHU AS SCHEDULED. RECONNECT TO EXISTING HWS/HWR PIPING ROUGH-INS. PROVIDE VALVES AND ACCESSORIES AS DETAILED. RECONNECT TO EXISTING DUCTWORK. PROVIDE REFRIGERANT PIPING PER MANUFACTURERS

KEY NOTES:

1. PROVIDE ANGLE BRACKETS AND PLATFORM MOUNTING SYSTEM TO HANG AHU FROM EXISTING WALL STRUCTURE
2. PROVIDE UNISTRUT MOUNTING SYSTEM TO HANG AHU FROM CEILING
3. DISCONNECT AND RECONNECT HOT WATER PIPING. RE-USE EXISTING CONTROL VALVE.



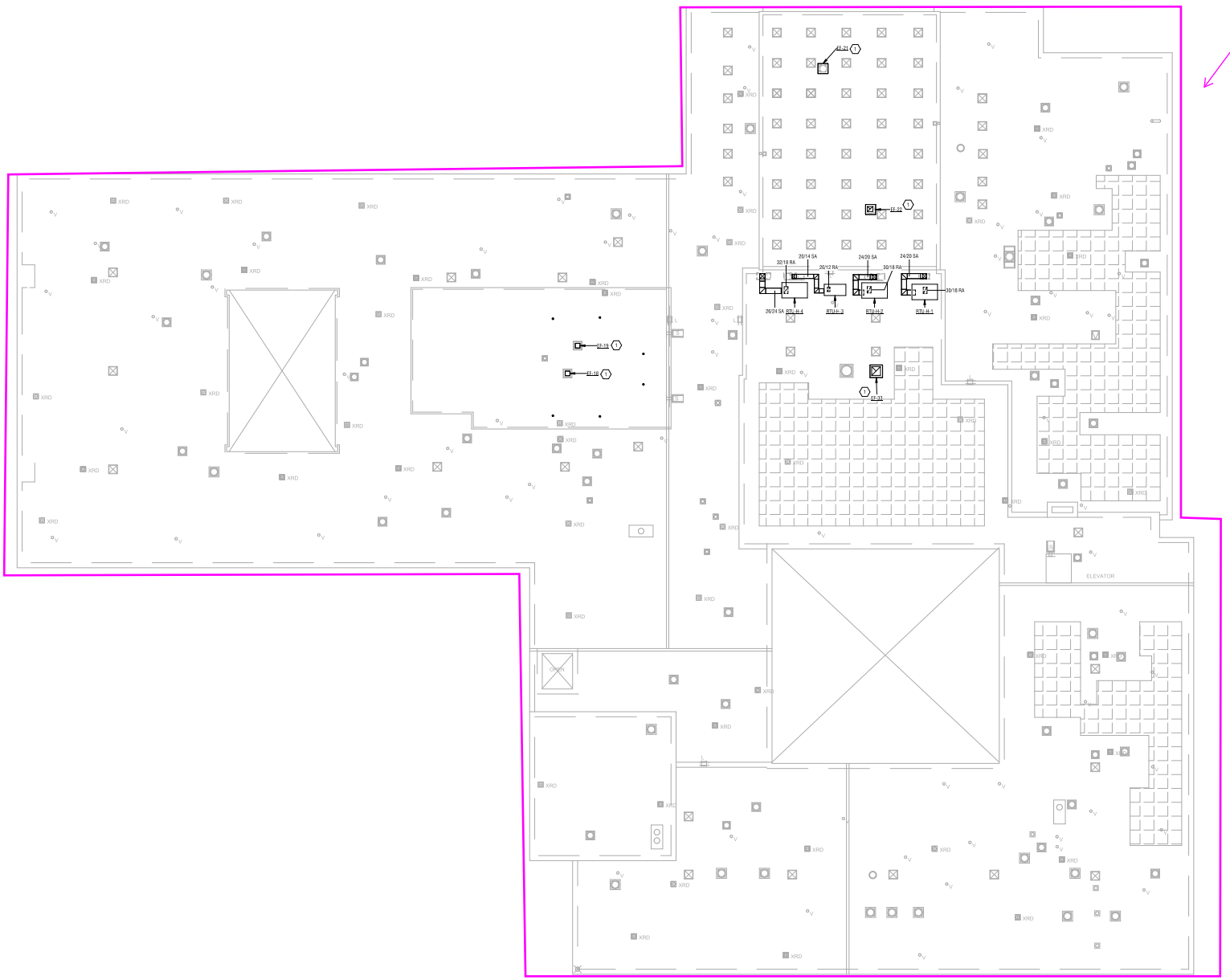
MECHANICAL NOTES:

1. PROVIDE TEMPERATURE SENSOR AND TIE BACK TO BMS SYSTEM (TYP.)
2. PROVIDE AHU AS SCHEDULED. RECONNECT TO EXISTING HWS/HWR PIPING ROUGH-INS. PROVIDE VALVES AND ACCESSORIES AS DETAILED. RECONNECT TO EXISTING DUCTWORK. PROVIDE REFRIGERANT PIPING PER MANUFACTURERS

KEY NOTES:

(1) RECONNECT TO EXISTING DUCTWORK BELOW ROOF. REUSE EXISTING ROOF CURB. PROVIDE ROOF CURB ADAPTOR AS REQUIRED.

Phase - 4



GRAPHIC SCALE

SCALE: 1/16" = 1'-0"

0 16' 32' 48' 64'

1 M103 ROOF MECHANICAL PLAN

1/16" = 1'-0"

7/10/2024 11:27:05 AM

LaBella
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Latham, NY 12110
(518) 273-0055
labellapc.com

STATE OF NEW YORK — MICHAEL L. BERGIN — 069659 — LICENSED PROFESSIONAL ENGINEER — EXP: 07/24

CERTIFICATE OF AUTHORIZATION NUMBER:
PROFESSIONAL ENGINEERING: 018281
LAND SURVEYING: 017976
GEOLOGICAL: 018750

It is a violation of New York Education Law Art. 145 Sec. 7209 & Art. 147 Sec. 7307, for any person, unless acting under the direction of a licensed architect, professional engineer, or land surveyor, to alter an item in any way. If an item bearing the seal of an architect, engineer, or land surveyor is altered, the altering architect, engineer, or land surveyor shall affix to the item their seal and notation "altered by" followed by their signature and date of such alteration, and a specific description of the alteration.

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NEWBURGH ENLARGED CITY SCHOOL DISTRICT

124 GRAND ST. - NEWBURGH, NY 12550

NEWBURGH ENLARGED CITY SCHOOL DISTRICT

TEMPLE HILL ACADEMY

525 UNION AVENUE
NEW WINDSOR, NY 12553

NO:	DATE:	DESCRIPTION:
Revisions		

S.E.D. NUMBER: 44-16-00-01-0-006-015

PROJECT NUMBER: 2233600

DRAWN BY: DRM

REVIEWED BY: MB

ISSUED FOR: NYSED ADDENDUM NO. 001

DATE: 07-08-2024

DRAWING NAME:

ROOF EQUIPMENT PLAN

DRAWING NUMBER:

M103

UNIT VENTILATOR

TAG	SERVED BY	SUPPLY FAN AIRFLOW (CFM)	SUPPLY FAN OA (CFM)	COOLING TOT. CAP. (BTU/H)	COOLING SENS. CAP. (BTU/H)	COOLING EAT DB (°F)	COOLING EAT WB (°F)	COOLING LAT DB (°F)	COOLING LAT WB (°F)	REFRIGERANT TYPE	TOT. CAP (BTU/H)	HEATING EAT DB (°F)	HEATING LAT DB (°F)	HEATING COIL ROWS	HEATING FLOW (GPM)	ELECTRICAL EWT (°F)	ELECTRICAL LWT (°F)	ELECTRICAL VOLT/HZ/PHASE	ELECTRICAL MCA (A)	ELECTRICAL MOCP (A)	UNIT SIZE L	UNIT SIZE W	UNIT SIZE H	WEIGHT (LB)	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	NOTES
UV-1	ODU-12	1500	500	50656	34148	80.0°F	67.0°F	58.2°F	55.6°F	R-410A	79326	47°F	99°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	66	22	30	600	DAIKIN APPLIED	LMV09V15	ALL
UV-2	ODU-12	1500	500	50656	34148	80.0°F	67.0°F	58.2°F	55.6°F	R-410A	79326	47°F	99°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	66	22	30	600	DAIKIN APPLIED	LMV09V15	ALL
UV-2A	ODU-12	750	210	25635	15482	80.0°F	67.0°F	60.9°F	55.9°F	R-410A	46057	51°F	108°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	62	22	30	370	DAIKIN APPLIED	LMV09V07	ALL
UV-3	ODU-12	1500	500	50656	34148	80.0°F	67.0°F	58.2°F	55.6°F	R-410A	79326	47°F	99°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	66	22	30	600	DAIKIN APPLIED	LMV09V15	ALL
UV-4	ODU-12	1500	500	50656	34148	80.0°F	67.0°F	58.2°F	55.6°F	R-410A	79326	47°F	99°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	66	22	30	600	DAIKIN APPLIED	LMV09V15	ALL
UV-5	ODU-13	1500	500	50656	34148	80.0°F	67.0°F	58.2°F	55.6°F	R-410A	79326	47°F	99°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	66	22	30	600	DAIKIN APPLIED	LMV09V15	ALL
UV-6	ODU-13	1500	500	50656	34148	80.0°F	67.0°F	58.2°F	55.6°F	R-410A	79326	47°F	99°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	66	22	30	600	DAIKIN APPLIED	LMV09V15	ALL
UV-7	ODU-14	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-8	ODU-13	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-9A	ODU-13	750	210	25635	15482	80.0°F	67.0°F	60.9°F	55.9°F	R-410A	46057	51°F	108°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	62	22	30	370	DAIKIN APPLIED	LMV09V07	ALL
UV-9B	ODU-13	750	210	25635	15482	80.0°F	67.0°F	60.9°F	55.9°F	R-410A	46057	51°F	108°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	62	22	30	370	DAIKIN APPLIED	LMV09V07	ALL
UV-10	ODU-13	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-11	ODU-14	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-12	ODU-14	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-13	ODU-14	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-14	ODU-14	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-15	ODU-14	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-17	ODU-22	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-20	ODU-22	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-21	ODU-22	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-42	ODU-22	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-109	ODU-30	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-110	ODU-30	1500	500	50656	34148	80.0°F	67.0°F	58.2°F	55.6°F	R-410A	79326	47°F	99°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	66	22	30	600	DAIKIN APPLIED	LMV09V15	ALL
UV-120	ODU-22	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-121	ODU-15	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-122	ODU-15	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-123	ODU-15	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-124	ODU-21	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-125A	ODU-15	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-125B	ODU-15	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-126A	ODU-21	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-126B	ODU-21	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-127	ODU-15	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-129	ODU-18	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-131A	ODU-18	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-131B	ODU-18	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-133	ODU-18	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-135A	ODU-18	750	210	25635	15482	80.0°F	67.0°F	60.9°F	55.9°F	R-410A	46057	51°F	108°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	62	22	30	370	DAIKIN APPLIED	LMV09V07	ALL
UV-135B	ODU-18	750	210	25635	15482	80.0°F	67.0°F	60.9°F	55.9°F	R-410A	46057	51°F	108°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	62	22	30	370	DAIKIN APPLIED	LMV09V07	ALL
UV-137	ODU-21	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-139	ODU-21	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-141	ODU-20	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-220	ODU-17	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-221	ODU-16	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-222	ODU-17	1500	500	51223	47563	80.0°F	67.0°F	58.2°F	55.6°F	R-410A	79326	47°F	99°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	66	22	30	600	DAIKIN APPLIED	LMV09V15	ALL
UV-223	ODU-16	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-224	ODU-17	750	210	25635	15482	80.0°F	67.0°F	60.9°F	55.9°F	R-410A	46057	51°F	108°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	62	22	30	370	DAIKIN APPLIED	LMV09V07	ALL
UV-225	ODU-17	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-226	ODU-20	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-227	ODU-19	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-227A	ODU-19	1500	500	51223	47563	80.0°F	67.0°F	58.2°F	55.6°F	R-410A	79326	47°F	99°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	66	22	30	600	DAIKIN APPLIED	LMV09V15	ALL
UV-228	ODU-20	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL
UV-229	ODU-17	1500	500	51223	47563	80.0°F	67.0°F	58.2°F	55.6°F	R-410A	79326	47°F	99°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	66	22	30	600	DAIKIN APPLIED	LMV09V15	ALL
UV-229A	ODU-19	1500	500	51223	47563	80.0°F	67.0°F	58.2°F	55.6°F	R-410A	79326	47°F	99°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	66	22	30	600	DAIKIN APPLIED	LMV09V15	ALL
UV-251	ODU-19	1500	500	51223	47563	80.0°F	67.0°F	58.2°F	55.6°F	R-410A	79326	47°F	99°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	66	22	30	600	DAIKIN APPLIED	LMV09V15	ALL
UV-253	ODU-19	1500	500	51223	47563	80.0°F	67.0°F	58.2°F	55.6°F	R-410A	79326	47°F	99°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	66	22	30	600	DAIKIN APPLIED	LMV09V15	ALL
UV-258A	ODU-19	750	210	25635	15482	80.0°F	67.0°F	60.9°F	55.9°F	R-410A	46057	51°F	108°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	62	22	30	370	DAIKIN APPLIED	LMV09V07	ALL
UV-258B	ODU-19	750	210	25635	15482	80.0°F	67.0°F	60.9°F	55.9°F	R-410A	46057	51°F	108°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	62	22	30	370	DAIKIN APPLIED	LMV09V07	ALL
UV-257	ODU-19	1500	500	51223	47563	80.0°F	67.0°F	58.2°F	55.6°F	R-410A	79326	47°F	99°F	2	2.0	180°F	134°F	208 V/60 Hz/1	4	15	66	22	30	600	DAIKIN APPLIED	LMV09V15	ALL
UV-259	ODU-20	1250	420	40407	28022	80.0°F	67.0°F	58.7°F	56.2°F	R-410A	76598	41°F	99°F	2	2.0	180°F	129°F	208 V/60 Hz/1	4	15	66	22	30	975	DAIKIN APPLIED	LMV09V13	ALL

NOTES:

1. PROVIDE PLENUM BACK
2. CUSTOM LOUVERS PROVIDED BY CONTRACTOR
3. CONTRACTOR TO PROVIDE 1/8" MINIMUM SPLITTER TO SEPERATE OA AND CONDENSOR AIR
4. ALL HYRDONIC CONNECTION ARE ON THE LEFT OF THE UNIT, CONTRACTOR TO ROUTE PIPING AS REQUIRED
5. PROVIDE MERV-13 FILTER

INDOOR AIR HANDLING UNITS

TAG	LOCATION	SERVES	AREA	FAN TOTAL CFM	FAN OA CFM	FAN MIN OA	FAN ESP (IN WG)	HW HEATING GPM	HW HEATING EAT	HW HEATING LAT	HW HEATING LWT	HW HEATING PD (FT)	DX COOLING MBH	DX COOLING EA (DB/WB)	DX COOLING LA (DB/WB)	DX COOLING SENSIBLE COOLING (MBH)	DX COOLING TOTAL COOLING (MBH)	ELECTRICAL V/PH	ELECTRICAL MOTOR HP	ELECTRICAL FLA	ELECTRICAL BHP	ELECTRICAL MCA	ELECTRICAL MOP	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	NOTES
T-1	STAGE	PLAYROOM WEST AND STAGE	3130	3600	1746	349	0.8	13.7	35.6	87.3	180	150	15.64	200	84.0 / 71.9	60.9 / 59.5	83.9	150.3	208V/3PH	4-Apr		1.27	25	35	DAIKIN	BCHD030D1	1,2,3,4
T-2	STAGE	PLAYROOM EAST	1885	2600	1320	264	0.8	10.1	34.9	87.6	180	150	10.33	148.1	85.8 / 72.0	60.8 / 59.6	71.1	111	208V/3PH	4-Jul		0.96	14.4	25	DAIKIN	BCHD030D1	1,2,3,4
T-5	GYM	GYM	3312.5	5130	2480	496	0.8	16.8	37.2	83.2	180	150	4	257.9	84.9 / 70.3	57.0 / 55.5	156.5	245	208V/3PH	2-Jul	11.4	2.8	12.8	15	DAIKIN	CAH015IDCM	1,3,4
T-6	GYM	GYM	3312.5	5130	2480	496	0.8	16.8	37.2	83.2	180	150	4	257.9	84.9 / 70.3	57.0 / 55.5	156.5	245	208V/3PH	2-Jul	11.4	2.8	12.8	15	DAIKIN	CAH015IDCM	1,3,4

NOTES:

1. CONTROLS BY PROJECT CONTROLS CONTRACTOR
2. UNITS HAVE LENGTH LIMITATIONS, TBD
3. HORIZONTAL UNITS WITH END SUPPLY, END OA, AND BOTTOM RA
4. PROVIDE MIXING BOX AND MERV 13 FILTERS
5. HORIZONTAL UNITS WITH END SUPPLY, TOP OA, AND BOTTOM RA

AIR COOLED CONDENSING UNITS (ACCU)

TAG	SERVES	LOCATION	NOMINAL TONS	COMPRESSORS	STAGES	COOLING MBH	COOLING AMBIENT DB	COOLING EER	SOUND LEVEL (dba)	ELECTRICAL SUPPLY VOLTAGE	ELECTRICAL MCA	ELECTRICAL MOP	WEIGHT (LBS)	REFRIGERANT NT TYPE	LINE SIZES (IN) SUCTION / LIQUID	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	NOTES
ACCU-T-1	PLAYROOM WEST AND STAGE	ROOF	15	2	2	143	95	14.2		208V/3PH	53	80	647	R-410A	1.625 / 0.625	DAIKIN	RCS150H1S0C	1,2,3,4
ACCU-T-2	PLAYROOM EAST	ROOF	12	1	2	115	95	11.2	84.7	208V/3PH	47.7	80	345	R-410A	1.625 / 0.625	DAIKIN	D14XA1203A	1,2,3,4
ACCU-T-5	GYM	ROOF	20	3	4	253	95	12.3	86	208V/3PH	95.8	125	1891	R-410A	1.38 (2) / 0.62 (2)	DAIKIN	RCS0200	1,2,3,4
ACCU-T-6	GYM	ROOF	20	3	4	253	95	12.3	86	208V/3PH	95.8	125	1891	R-410A	1.38 (2) / 0.62 (2)	DAIKIN	RCS0200	1,2,3,4

NOTES:

1. COMPRESSOR WARRANTY - 5 YEARS
2. PARTS WARRANTY - 1 YEAR
3. LOW AMBIENT TO 45 DEGREES
4. PROVIDE APR VALVE PER CIRCUIT

EXHAUST FAN

TAG	SERVES	TYPE	AIRFLOW CFM	TSP IN WG	DRIVE	DIMENSIONS	RPM	MOTOR HP	FLA	MOP	VOLTAGE/PHASE	NOISE (SONES)	CONTROL	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	NOTES
EF-18	PLAYROOM	ROOF DOWNBLAST	1700	0.25	DIRECT	22" x 22"		1/2	6.6	15	115V/1PH	9	0-10 vdc	GREENECK	G-140-VG	1,2,3,5
EF-19	PLAYROOM	ROOF DOWNBLAST	1600	0.25	DIRECT	22" x 22"		1/2	6.6	15	115V/1PH	9	0-10 vdc	GREENECK	G-140-VG	1,2,3,5
EF-21	GYM	ROOF DOWNBLAST	4455	0.25	BELT	40" x 40"		1/2	9.8	20	115V/1PH	8.4	VFD	GREENECK	GB-300-31-KOKQ0DRI	1,2,3,4
EF-22	GYM	ROOF DOWNBLAST	4455	0.25	BELT	40" x 40"		1/2	9.8	20	115V/1PH	8.4	VFD	GREENECK	GB-300-31-KOKQ0DRI	1,2,3,4
EF-53	KITCHEN	ROOF DOWNBLAST	9000	0.25	BELT	41.5" x 41.5"	460	1.5	8.8	15	208V/1PH	8.2	VFD	GREENECK	GB-300-151-KOKQ0-DR1	1,2,3,4

NOTES:

1. PROVIDE 12 INCH INSULATED ROOF CURB
2. PROVIDE BACKDRAFT DAMPER
3. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH
4. PROVIDE VFD TO BE MOUNTED INDOORS
5. ECM MOTOR

DUCTED HEATING COIL

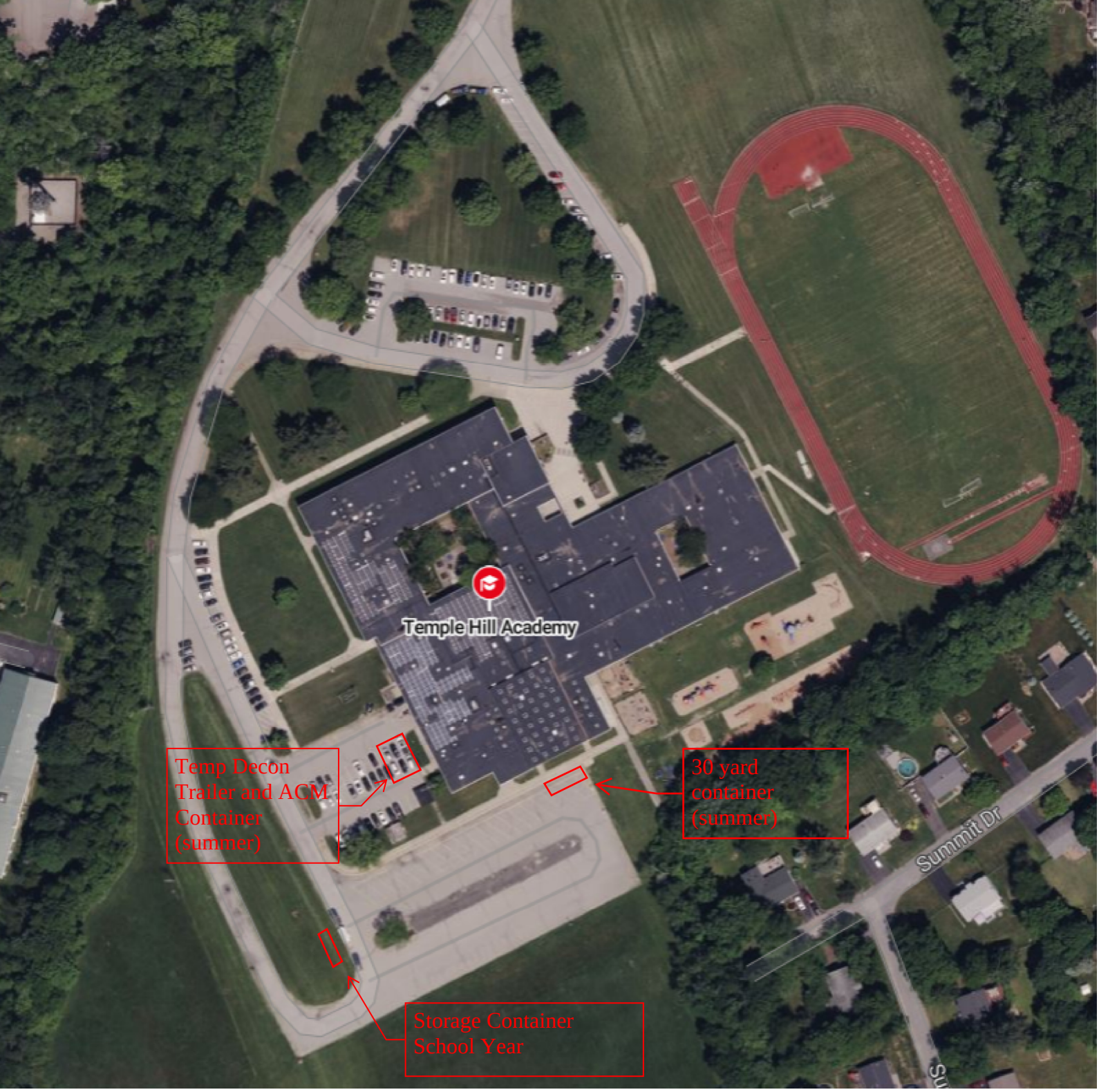
TAG	CFM	EAT / LAT	CAPACITY	EWT/LWT	FLOWRATE	FACE AREA	FACE VELOCITY (FPM)	# ROWS	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	NOTES
HC-H1	3250	58F / 90F	112,320 BTUH	160/140	11.2 GPM	6.5 SQFT	500	1			
HC-H2	3250	58F / 90F	112,320 BTUH	160/140	11.2 GPM	6.5 SQFT	500	1			
HC-H3	1500	58F / 90F	51,840 BTUH	160/140	5.2 GPM	3.0 SQFT	500	1			
HC-H4	4500	58F / 90F	155,520 BTUH	160/140	15.5 GPM	9.0 SQFT	500	1			

PACKAGED COOLING ROOFTOP UNIT WITH ENERGY RECOVERY WHEEL

TAG	LOCATION	TOTAL CFM	OA CFM	ESP	EER/IEER	DX COOLING TOTAL CAPACITY	DX COOLING SENSIBLE CAPACITY	DX COOLING REFRIGERANT	DX COOLING EAT DB/WB	DX COOLING LAT DB/WB	HOT GAS REHEAT CAPACITY	HOT GAS REHEAT LAT DB/WB	ENERGY RECOVERY WHEEL SUMMER OA DB/WB	SUMMER RA DB/WB	SUMMER MIXED AIR DB/WB LAT	SUMMER REMOVED CAPACITY	ENERGY RECOVERY WHEEL WINTER OA DB/WB	WINTER RA DB/WB	WINTER MIXED AIR DB/WB LAT	WINTER REMOVED CAPACITY	ENERGY RECOVERY WHEEL EFFECTIVENESS TOTAL	ENERGY RECOVERY WHEEL EFFECTIVENESS SENSIBLE	DIMENSIONS (LxWxH)	WEIGHT (LBS)	ELECTRICAL V/PH	ELECTRICAL FLA	ELECTRICAL MCA	ELECTRICAL MOP	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	NOTES
RTU-H-1	ROOF	3250	1535	1.0"	12.0/21.7	96,476 BTUH	81,385 BTUH	R32	78.8F/63.5F	53F/53F	60,268 BTUH	70F/58F	95F/75F	75F/63F	78.5F/63.5F	57,020 BTUH	0.78	0.6	0F/0F	75F/50F	58.8F/43.9F	108,662 BTUH	0.8	0.81	121.6 X 85.9 X 73.4	2299	208V/3PH	64.9	75.4	110	DAIKIN	DPSC078	
RTU-H-2	ROOF	3250	1535	1.0"	12.0/21.7	96,476 BTUH	81,385 BTUH	R32	78.8F/63.5F	53F/53F	60,268 BTUH	70F/58F	95F/75F	75F/63F	78.5F/63.5F	95	0.78	0.6	0F/0F	75F/50F	58.8F/43.9F	108,662 BTUH	0.8	0.81	121.6 X 85.9 X 73.4	2299	208V/3PH	64.9	75.4	110	DAIKIN	DPSC078	
RTU-H-3	ROOF	1500	512	0.75"	14.1/20.28	37,774 BTUH	25,659 BTUH	R32	78.8F/63.5F	54F/54F	23,734 BTUH	70F/58F	95F/75F	75F/63F	78.5F/63.5F	95	0.75	0.78	0F/0F	75F/50F	58.8F/43.9F	38,304 BTUH	0.77	0.78	103.4 X 69.5 X 53.3	1447	208V/3PH	30.8	35.5	50	DAIKIN	DPSC038	
RTU-H-4	ROOF	4500	2250	1.0"	12.4/21.3	124,934 BTUH	108,741 BTUH	R32	77.5F/64F	54F/54F	76,271 BTUH	70F/60F	95F/75F	75F/63F	78.5F/63.5F	95	0.73	0.74	0F/0F	75F/50F	58.8F/43.9F	144,599 BTUH	0.74	0.75	121.6 X 85.9 X 73.4	2452	208V/3PH	73.7	73.7	125	DAIKIN	DPSC108	

AIR-COOLED VRV HEAT PUMP CONDENSING UNIT SCHEDULE

TAG	NOMINAL HEATING CAPACITY (BTU/H)	NOMINAL COOLING CAPACITY (BTU/H)	REFRIGERANT TYPE	REFRIGERANT FACTORY CHARGE (LBS)	DIMENSIONS (L X W X H)	WEIGHT (LBS)	ELECTRICAL VOLTAGE/PHASE	ELECTRICAL RLA	ELECTRICAL MCA	ELECTRICAL MOP	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	NOTES
ODU-1	73,000	69,000	R-410A	13.0	65-2/5" X 35-11/16" X 30-3/16"	496	208V/3PH	11.1	27.3	30


Temple Hill Academy
Temp Decon Trailer and ACM Container (summer)
30 yard container (summer)
Storage Container School Year
Summit Dr

SECTION 00 31 26 – EXISTING HAZARDOUS MATERIALS INFORMATION

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. Include this wording with each Section 1.1.A

B. Existing Hazardous Materials reports are included as attachments at the end of this section and are hereby incorporated into the Procurement and Contracting Requirements by reference.

1. A copy of LaBella Associates, D.P.C. "Pre-Renovation Regulated Building Materials Inspection" Report for Newburgh Enlarged Central School District – Meadow Hill School (Newburgh, New York), dated December 21, 2023, is bound in the Project Manual (Attachment A).

2. A copy of LaBella Associates, D.P.C. "Pre-Renovation Regulated Building Materials Inspection" Report for Newburgh Enlarged Central School District – Temple Hill School (New Windsor, New York), dated December 21, 2023, is bound in the Project Manual (Attachment B).

3. A copy of LaBella Associates, D.P.C. "Pre-Renovation Regulated Building Materials Inspection" Report for Newburgh Enlarged Central School District – Gidney Avenue Memorial School (Newburgh, New York), dated December 21, 2023, Revised June 10, 2024, is bound in the Project Manual (Attachment C).

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 31 26

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ATTACHMENT A:

PRE-RENOVATION REGULATED BUILDING MATERIALS INSPECTION REPORT – MEADOW HILL SCHOOL

Limited Pre-Renovation
Regulated Building Materials Inspection

Location:

Meadow Hill School
124 Meadow Hill Road
Newburgh, New York 12550

Prepared for:

Newburgh Enlarged City School District
124 Grand Street
Newburgh, New York 12550

LaBella Project No.

2233600

December 21, 2023

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Appendix B – Sample Location Drawings

Appendix C – Inspection Photos

Appendix D – Laboratory Analytical Reports

Appendix E – Licenses and Certifications

1.0 PROJECT DESCRIPTION

In accordance with current regulations, LaBella Associates, D.P.C. (LaBella) conducted a Limited Pre-Renovation Regulated Building Materials (RBM) Inspection of the Meadow Hill School located at 124 Meadow Hill Road, Newburgh, New York. The objective was to identify suspect RBMs, such as Asbestos-Containing Materials (ACM), Lead-Based Paint (LBP), and PCB-containing materials that may require abatement or removal prior to or during renovation due to applicable regulations.

The areas inspected were limited to the interior of the Meadow Hill School that are expected to be impacted during an upcoming districtwide AC electrical upgrade project. Materials and locations understood to be impacted by this project were determined from information provided by the Newburgh Enlarged City School District and LaBella's Architectural Department.

2.0 INSPECTION PROCEDURES

The following procedures were used to obtain the data for this Report:

A. An AHERA report titled "Newburgh Enlarged City School District Meadow Hill School", prepared on November 29, 2006, was reviewed to develop an understanding of the previously sampled materials and confirmed ACMs at the Site.

B. A visual inspection of areas impacted by the upcoming districtwide AC electrical upgrade project was conducted to identify visible and accessible sources of the above referenced suspect RBMs. Photographs captured during this inspection are attached in Appendix C.

C. Bulk samples of accessible suspect materials were collected and submitted for laboratory analysis.

D. Asbestos samples were submitted for laboratory analysis. Preliminary Polarized Light Microscopy analyses were performed by LaBella Laboratories, a NYSDOH accredited laboratory, to determine the presence and percentage of asbestos in each sample. Transmission electron microscopy analyses of NOB materials, if necessary, were performed by AMA Laboratories.

E. Suspect painted or glazed materials were spot checked in the field using XRF testing procedures for the presence of lead.

F. Results of the laboratory analyses, field testing and the visual on-site inspection were compiled and summarized.

3.0 INSPECTION LIMITATIONS

This inspection was conducted in accordance with generally accepted environmental engineering practices for this region. Collection of bulk samples of suspect RBMs was limited to those materials readily accessible using hand tools or hand-held power tools. Homogeneous materials were identified and located based on visual observation from readily accessible points. The data derived from representative samples of any given homogeneous material represent conditions that apply only at that particular location. Inspection protocol and methodology requires that sample data be used to draw conclusions about the entire homogeneous area, but such conclusions may not necessarily apply to the general Site as a whole.

No sub-surface investigations were performed to determine the possible presence of regulated materials on or in the immediate vicinity of the Site. No record drawings of the building were available for review as part of this investigation.

LaBella makes no other warranty or representation, either expressed or implied, nor is one intended to be included as part of its services, proposals, contracts, or reports. No inspection can wholly eliminate the uncertainty regarding the potential for undiscovered RBMs. The Work performed by LaBella is intended to reduce, but not eliminate, uncertainty regarding the potential for RBMs at the Site. This inspection report is not intended to be a bid document for an abatement scope of work. This report is intended to satisfy the requirements of NYS Code Rule 56-5 for asbestos inspections. Abatement project design can only be performed by a certified Project Designer.

Roofing Systems

Due to the risk of voiding the manufacturer's/contractor's roof warranty, LaBella did not perform core sampling of the roofing systems to sample suspect materials. Prior to any renovation/ demolition activities that may disturb roofing materials, additional investigation, including bulk sampling/analysis of suspect roofing materials shall be conducted.

4.0 INSPECTION RESULTS

4.1 Asbestos-Containing Materials (ACMs)

Based on laboratory analyses of bulk samples collected, none of the materials tested were determined to contain asbestos. However, the previous AHERA report identifies multiple ACMs, which are summarized in the table below. Additionally, the roofing system, Materials associated with the AHUs, exterior louver caulking, and exterior waterproofing membrane are assumed to contain asbestos until sampling can be performed. For a full list of materials sampled, please refer to the *Asbestos Bulk Sample Summary Table*.

Type of Material	Typical Location[1]	Estimated Amount[2]	Friability	Condition
MATERIALS IDENTIFIED IN THE 2006 AHERA REPORT				
Mudded Pipe Fittings Associated with AHU Hot Water Lines	Gymnasium and stage	Unknown	Friable	Good
9" Floor Tile and Associated Mastic	*See Description Below*	Unknown	Non-Friable	Good
Block Paint	*See Description Below*	Unknown	Non-Friable*	Good
Black Sink Undercoating	Science Labs Underside of Sinks	8 SF	Non-Friable	Good

*This material is considered to be non-friable in its current, intact condition. However, this material has the potential to become friable during any renovation/demolition activities that will disturb the material.

ACM Project Specific Details

Floor Tile and Associated Mastic

Various colored 9" asbestos-containing floor tiles and the associated asbestos-containing mastic are located throughout the school. Based on field observations made at the time of inspection, in areas where the 9" floor tiles were not visible, it is assumed that the 9" floor tiles are located under newer 12" floor tiles. Field observations also revealed that these materials are present under unit ventilators throughout the school. Where accessible, the floor tiles and mastic were generally in good condition.

[1] Typical Location may not be inclusive of all material locations present at the subject structure.
[2] For general reference only: Quantities reflect only those materials understood to be impacted by the project. Estimated amounts of confirmed ACM listed above were obtained through field observations made during site visits. Quantities are approximations and LaBella assumes no responsibility if used for bidding.

Block Paint

Asbestos-containing block paint was identified in the AHERA report as being located on block walls throughout the school. Based on information outlined in the AHERA report, it is assumed that the AC block paint is present beneath other layers of non-ACM paint. It is assumed that the ACM block paint is present in all areas scheduled to be impacted by the upcoming districtwide AC electrical upgrade project.

4.2 PCB-Containing Materials

Caulking and Glazing Compounds

According to the Environmental Protection Agency (EPA), PCB-containing building materials were commonly used in buildings built or renovated between circa 1950 and 1979. Caulking and glazing compounds were often used around windows, door frames, building joints, masonry columns and other masonry building materials. PCBs from manufactured sources (caulk), may also contaminate adjoining materials, such as masonry or wood, through direct contact and create secondary sources.

As such, prior to removal, the EPA recommends testing caulk and other building materials to determine what protections are needed during removal, and to determine proper disposal requirements. Building materials (caulking, sealants, etc.) containing equal to or greater than 50 ppm PCB must be disposed of as PCB-Contaminated hazardous waste in accordance with 40 CFR part 761, subpart D. Therefore, the following suspect building materials were sampled and analyzed for the presence of PCBs:

- Gray caulking located around air-conditioning units (1)

Based on laboratory analysis, this caulking compound is *not* considered to be PCB-Contaminated (i.e., NOT $\geq$ 50 ppm PCBs). When removed, the caulk may be disposed of as construction and demolition debris.

4.3 Lead – Based Paint

Several representative interior painted surfaces were observed and tested for the presence of lead-based paint using XRF testing procedures. In accordance with Environmental Protection Agency (EPA) protocols, no materials were observed or tested which contain lead above the action level threshold of 1.0 mg/cm^2. However, additional lead-based materials may exist within the school. Therefore, contractors shall be responsible for determining the quantity, location and condition of materials not tested during this inspection.

For a full list of materials and components tested during this inspection, please refer to the XRF Lead Sampling Summary Table immediately following this report.

The building inspected for this project includes spaces applicable to the requirements of EPA 40 Code of Federal Regulations (CFR) 745: Lead-Based Paint Renovation, Repair and Painting (RRP) Program Rule. The RRP Rule affects any contractor who disturbs known or presumed lead-based paint during any renovation, repair or painting projects in housing, childcare facilities, and preschools built before 1978. Any contractor performing renovation work in applicable areas throughout the building must be certified, assign a "certified renovator" to each job where lead-based paint will likely be disturbed, train its renovation workers, distribute the EPA's Renovate Right lead hazard pamphlet before starting work, and use lead safe work practices.

Additionally, lead was detected at low concentrations in a variety of other building materials. Renovation and demolition contractors should be informed of the presence of lead for OSHA compliance considerations.

For purposes of reading this report, and understanding which wall or component in a particular space was sampled, walls were assigned the letters A, B, C, or D. The wall labeled as "A" is the address side of the building; walls B, C, and D will follow clockwise in succession.

5.0 OBSERVATIONS AND CAUTIONARY STATEMENTS

Vermiculite

Vermiculite has been used as loose insulation in attics, walls, CMU block, and as a component of plaster, fireproofing and other building materials. The NYS Department of Health considers loose-fill Vermiculite to be an asbestos-containing material, and that building materials containing Vermiculite should be treated as asbestos-containing until sent for additional analysis and proven negative in accordance with NYS DOH guidelines.

Vermiculite was not observed in spaces and materials inspected for this project. However, destructive investigation of wall cavities was not conducted, and therefore the presence or extent of this material's application throughout the building was not determined.

Cautionary measures should be taken during construction, renovation, and demolition to ensure that proper steps are taken if Vermiculite is discovered in previously inaccessible locations. If Vermiculite is discovered, work should be stopped immediately to address the issue and prevent the uncontrolled release and distribution of an asbestos-containing material.

Exterior Waterproofing Membrane

Waterproofing membranes are often installed between exterior and interior walls to prevent water from migrating into the building from exterior facades. Although a waterproofing membrane was not observed during this inspection, destructive investigation of exterior walls was not performed, and therefore the presence or extent of this material's application throughout the building was not determined. Until destructive investigation can occur, it should be assumed that a waterproofing membrane is present between exterior and interior walls throughout the school. This material should be treated as asbestos-containing until sampling and subsequent analysis determines the membrane to be non-asbestos containing.

Cautionary measures should be taken during construction, renovation, and demolition to ensure that proper steps are taken if a waterproofing membrane is discovered in previously inaccessible locations. If a suspect material is discovered, work should be stopped immediately to address the issue and prevent the uncontrolled release and distribution of a potential asbestos-containing material.

Potentially Hidden/Inaccessible RBMs

As stated earlier, collection of bulk samples of suspect RBMs was limited to those materials readily accessible. Since the building is occupied and in operation as a school open to the public, destructive sampling techniques were limited in order to minimize disruption to school operations and damage to building components.

Although this inspection was conducted in a manner consistent with recognized professional practices, the potential does exist for additional RBMs to be inaccessible, hidden, and undiscovered in the area inspected.

Asbestos Bulk Sample Summary Table

Asbestos Bulk Sample Summary Table

Limited Pre-Renovation Regulated Building Materials Inspection
Meadow Hill School
124 Meadow Hill Road - Newburgh, New York 12550

No Asbestos Detected in Any of the Materials Tested

Sample #	*Type of Material*	*Sample Location*	*Results % Asbestos*
1A	Gray Air-Conditioning Unit Caulk	Room 225	NAD
1B	Gray Air-Conditioning Unit Caulk	Room 233	NAD
2A	White 2x4 Pinhole and Fissure Ceiling Tile	1st Floor Corridor	NAD
2B	White 2x4 Pinhole and Fissure Ceiling Tile	1st Floor Corridor	NAD
3A	White 2x4 Pinhole and Large Fissure Ceiling Tile	2nd Floor Corridor	NAD
3B	White 2x4 Pinhole and Large Fissure Ceiling Tile	2nd Floor Corridor	NAD
4A	Black Cove Base	Choir	NAD
4B	Black Cove Base	Choir	NAD
5A	Tan with Brown Comingled Cove Base Adhesive	Choir	NAD
5B	Tan with Brown Comingled Cove Base Adhesive	Choir	NAD
6A	Light Brown Cove Base	Room 139	NAD
6B	Light Brown Cove Base	Band	NAD
7A	Tan with Brown Comingled Cove Base Adhesive	Room 139	NAD
7B	Tan with Brown Comingled Cove Base Adhesive	Band	NAD
8A	Brown Cove Base	Room 126B	NAD
8B	Brown Cove Base	Room 126B	NAD
9A	Tan with Brown Comingled Cove Base Adhesive	Room 126B	NAD
9B	Tan with Brown Comingled Cove Base Adhesive	Room 126B	NAD
10A	Brown with Gray and Black Terrazzo	Room 17	NAD

Asbestos Bulk Sample Summary Table

Limited Pre-Renovation Regulated Building Materials Inspection
Meadow Hill School
124 Meadow Hill Road - Newburgh, New York 12550

No Asbestos Detected in Any of the Materials Tested

Sample #	*Type of Material*	*Sample Location*	*Results % Asbestos*
10B	Brown with Gray and Black Terrazzo	Room 17	NAD
11A	Gray Plaster Basecoat	Room 235A	NAD
11B	Gray Plaster Basecoat	Room 235A	NAD
11C	Gray Plaster Basecoat	Room 235A	NAD
12A	Gray Plaster Topcoat	Room 235A	NAD
12B	Gray Plaster Topcoat	Room 235A	NAD
12C	Gray Plaster Topcoat	Room 235A	NAD

XRF Lead Sampling Summary Table

XRF Lead Sampling Summary Table
Canandaigua Operation – Transportation Center
215 Granger Street, Canandaigua, New York 14424
LaBella Project No. 2200128

Reading No.	Location (Room)	Wall (A, B, C D) & Structure	Substrate	Color	XRF Result
1	Calibration	---	---	---	Pass
2	Calibration	---	---	---	Pass
3	Calibration	---	---	---	Pass
4	Calibration	---	---	---	Pass
7	Counselor	C	Block	Teal I	0
8	235	C	Block	White I	0
9	235	C	Gypsum	White I	0
10	235	C	Metal	Black I	0
11	235	C	Metal	White I	0
12	237B	C	Metal	Gray I	0.1
13	237B	C	Block	White I	0
14	237A	C	Block	Off-White I	0
15	237A	C	Block	White I	0
16	237A	C	Gypsum	White I	0
17	239	C	Block	White I	0.2
18	239	C	Metal	Black I	0
19	239	C	Metal	White I	0
20	230	A	Block	White I	0
21	228	A	Block	Yellow I	0.1
22	228	A	Metal	Brown I	0
23	226	A	Block	White I	0
24	224	B	Wall	White I	0
25	224	B	Metal	Black I	0
26	224	B	Metal	White I	0

I = Intact Condition. No visible damage or deterioration
P = Poor Condition. Paint is chipped, peeling, or otherwise damaged

XRF Lead Sampling Summary Table
Canandaigua Operation – Transportation Center
215 Granger Street, Canandaigua, New York 14424
LaBella Project No. 2200128

Reading No.	Location (Room)	Wall (A, B, C D) & Structure	Substrate	Color	XRF Result
27	222	B	Block	White I	0
28	220	B	Block	White I	0
29	220	B	Metal	Brown I	0
30	217	A	Block	White I	0
31	217	A	Metal	Brown I	0
32	221	A	Block	White I	0
33	221	A	Metal	Brown I	0
34	221	A	Metal	Black I	0
35	221	A	Metal	White I	0
36	223	D	Block	White I	0
37	223	D	Metal	Brown I	0
38	225	D	Block	White I	0
39	225	D	Metal	Brown I	0
40	227A	D	Block	White I	0
41	227B	D	Block	White I	0
42	Calibration	---	---	---	Pass
43	Calibration	---	---	---	Pass
44	Calibration	---	---	---	Pass
45	Calibration	---	---	---	Pass
46	Test	---	---	---	---
47	229	B	Block	White I	0
48	231	B	Block	White I	0
49	231	B	Wood	White I	0
50	232	B	Block	White I	0

I = Intact Condition. No visible damage or deterioration
P = Poor Condition. Paint is chipped, peeling, or otherwise damaged

XRF Lead Sampling Summary Table
Canandaigua Operation – Transportation Center
215 Granger Street, Canandaigua, New York 14424
LaBella Project No. 2200128

Reading No.	Location (Room)	Wall (A, B, C D) & Structure	Substrate	Color	XRF Result
51	233	B	Block	White I	0
52	233	B	Metal	Black I	0
53	233	B	Metal	White I	0
54	133	D	Block	White I	0
55	133	D	Metal	Brown I	0
56	131B	D	Block	White I	0
57	131B	D	Metal	Off-White I	0
58	131A	D	Block	White I	0
59	131A	D	Metal	Black I	0
60	131A	D	Metal	White I	0
61	129	D	Block	White I	0
62	129	D	Metal	Brown I	0
63	130	D	Block	White I	0
64	125B	D	Block	White I	0.1
65	125B	D	Metal	White I	0
66	127	D	Block	White I	0.1
67	125A	D	Block	White I	0
68	123	D	Block	White I	0.1
69	123	D	Metal	Brown I	0
70	123	D	Metal	Black I	0
71	123	D	Metal	White I	0
72	122	B	Block	White I	0
73	135	C	Block	White I	0
74	135	C	Metal	White I	0
75	124	A	Block	White I	0

I = Intact Condition. No visible damage or deterioration
P = Poor Condition. Paint is chipped, peeling, or otherwise damaged

XRF Lead Sampling Summary Table
Canandaigua Operation – Transportation Center
215 Granger Street, Canandaigua, New York 14424
LaBella Project No. 2200128

Reading No.	Location (Room)	Wall (A, B, C D) & Structure	Substrate	Color	XRF Result
76	124	A	Metal	Black I	0
77	124	A	Metal	White I	0
78	126A	A	Block	White I	0
79	126A	A	Metal	Brown I	0
80	139	D	Block	White I	0
81	141	D	Block	White I	0
82	141	D	Metal	Brown I	0
83	126B	A	Block	White I	0
84	137	D	Block	White I	0
85	120	B	Block	White I	0
86	120	B	Metal	Black I	0
87	120	B	Metal	White I	0
88	121	D	Metal	Brown I	0
89	121	D	Block	White I	0
90	Band	C	Block	White I	0
91	Band	C	Metal	Brown I	0
92	Choir	C	Block	White I	0
93	22	C	Block	White I	0.1
94	22	C	Metal	Brown I	0
95	Gymnasium	A (Duct)	Metal	White I	0
96	1	B	Block	White I	0
97	1	B	Metal	Black I	0
98	1	B	Metal	White I	0
100	2	B	Block	White I	0
101	2	B	Metal	Brown I	0

I = Intact Condition. No visible damage or deterioration
P = Poor Condition. Paint is chipped, peeling, or otherwise damaged

XRF Lead Sampling Summary Table
Canandaigua Operation – Transportation Center
215 Granger Street, Canandaigua, New York 14424
LaBella Project No. 2200128

Reading No.	Location (Room)	Wall (A, B, C D) & Structure	Substrate	Color	XRF Result
102	2	B	Metal	White I	0
103	3	B	Block	White I	0
104	3	B	Block	Blue I	0
105	S4	D	Block	White I	0
106	7	A	Block	Dark Blue I	0
107	7	A	Block	Blue I	0
108	7	A	Metal	Dark Blue I	0
109	4	B	Block	White I	0
110	5	B	Block	White I	0
111	5	B	Metal	Brown I	0
112	S5	D	Block	White I	0
113	S5	B	Metal	Blue I	0
114	6	B	Block	White I	0
115	6	B	Metal	Black I	0
116	8	A	Block	White I	0
117	8	A	Metal	Black I	0
118	8	A	Metal	White I	0
119	9A	A	Block	White I	0
120	9A	A	Metal	Brown I	0
121	10	D	Block	White I	0
122	10	D	Metal	Brown I	0
123	11	D	Block	White I	0
124	Library Storage	B	Block	White I	0
125	142B	C	Block	White I	0

I = Intact Condition. No visible damage or deterioration
P = Poor Condition. Paint is chipped, peeling, or otherwise damaged

XRF Lead Sampling Summary Table
Canandaigua Operation – Transportation Center
215 Granger Street, Canandaigua, New York 14424
LaBella Project No. 2200128

Reading No.	Location (Room)	Wall (A, B, C D) & Structure	Substrate	Color	XRF Result
126	Kindergarten Library	C	Block	White I	0
127	12	D	Block	White I	0
128	12	D	Metal	Black I	0
129	12	D	Metal	White I	0
130	13	D	Block	White I	0
131	14	D	Block	White I	0
132	Teachers	D	Block	White I	0
133	Teachers	D	Metal	White I	0
134	15	A	Block	White I	0
135	15	A	Metal	Brown I	0
136	17	C	Block	White I	0.1
137	17	C	Metal	Off-White I	0
138	Guidance 1	C	Block	White I	0
139	Guidance 1	C	Block	Blue I	0
140	Guidance 2	C	Metal	Off-White I	0
141	Guidance 3	C	Block	White I	0
142	Guidance 3	C	Metal	Blue I	0
143	Guidance 4	C	Block	White I	0
144	Guidance 5	C	Block	White I	0
145	Guidance 5	C	Metal	Blue I	0
146	Guidance 6	C	Block	White I	0
147	Guidance 7	C	Metal	Brown I	0

I = Intact Condition. No visible damage or deterioration
P = Poor Condition. Paint is chipped, peeling, or otherwise damaged

APPENDIX A:
INSPECTION FACT SHEET

Inspection Fact Sheet

Name and Address of Building/Structure

Meadow Hill School

124 Meadow Hill Road

Newburgh, New York 12550

Name and Address of Building/Structure Owner

Newburgh Enlarged City School District

124 Grand Street

Newburgh, New York 12550

Name and Address of Owner's Agent

LaBella Associates, D.P.C.

300 State Street, Suite 201

Rochester, New York 14614

Name of the Firm & Person Conducting the Inspection

LaBella Associates, D.P.C.

Cameron Heller *(NYSDOL Cert. #23-61DAA-SHAB)*

Donald Monroe (NYSDOL Cert. #23-6T6H7-SHAB)

Dates the Inspection Was Conducted

November 24, December 11 and 14, 2023

APPENDIX B:
SAMPLE LOCATION DRAWINGS

APPENDIX C:
INSPECTION PHOTOS



Photo 1

View of Asbestos-Containing 9” Floor Tile in Classroom

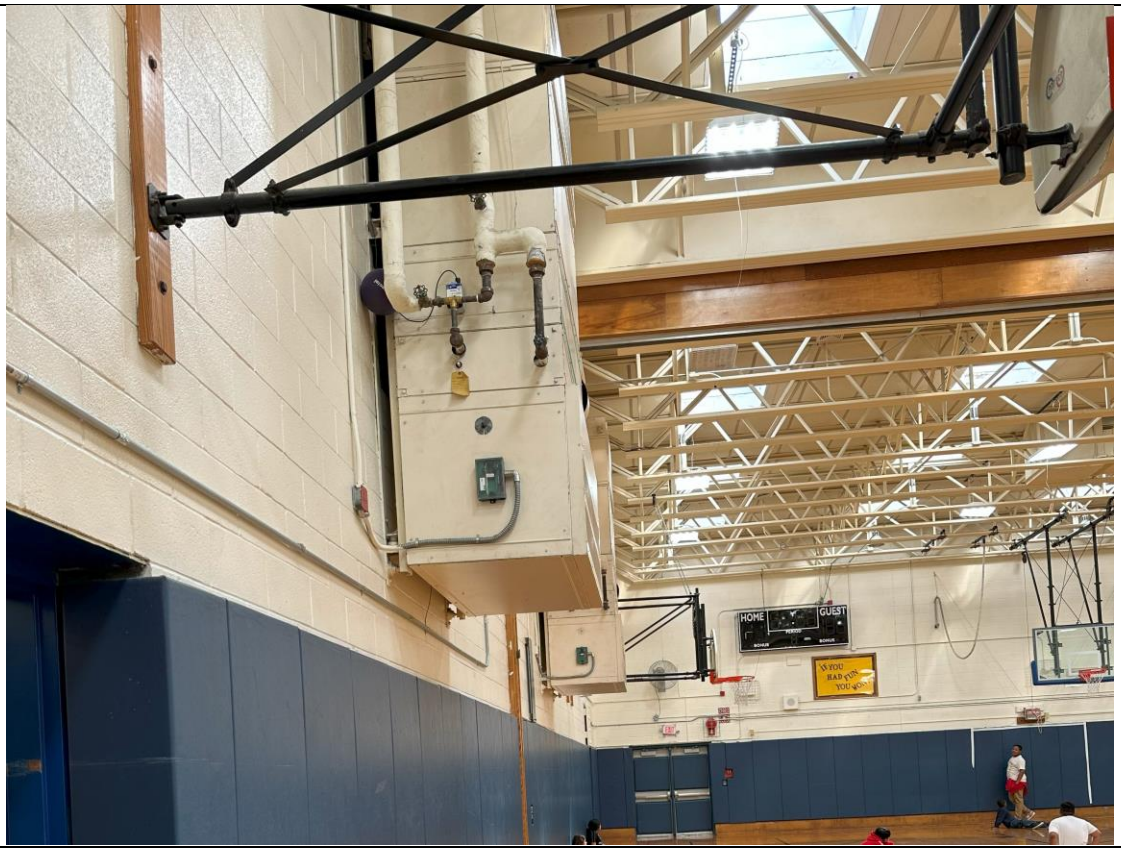


Photo 2

View of Asbestos-Containing Mudded Pipe Fittings in Gymnasium



Photo 3

View of Asbestos-Containing Mudded Pipe Fittings in Fan Room



Photo 4

View of Assumed Asbestos-Containing Louver Caulk



Photo 5

View of Assumed Asbestos-Containing Roofing System

APPENDIX D:
LABORATORY ANALYTICAL REPORTS

Bulk Sample Asbestos Analytical Report

LABELLA ASSOCIATES, DPC
ANALYTICAL LABORATORY
300 STATE STREET
ROCHESTER, NY 14614
585.454.6110 FAX 585.454.3066

LBL ELAP # 11184
All TEM analysis by AMA Lab, ELAP # 10920
PLM Methods: 198.1, 198.4 & 198.6
RSD: 18.3

LBL JOB # 1,22123

Client Code:

CLIENT: Labella Associates
ADDRESS: 300 State Street
Rochester, NY 14614

Project Number: 2233600
Sample Type: PLM Bulk
Sample Date: 12/15/2023

PROJECT LOCATION: 124 Meadow Hill Road, Newburgh, NY

Field ID	LBL ID	Method	Asbestos Type	%	Other Fibers	%	Matrix	%	Color/Description
1A	122123-1	T	ND		ND		MIN/BINDER	100	GRAY CAULK
1B	122123-2	T	ND		ND		MIN/BINDER	100	GRAY CAULK
2A	122123-3	T	ND		CELL/GLASS	100	NDM		WHITE CEILING TILE
2B	122123-4	T	ND		CELL/GLASS	100	ND		WHITE CEILING TILE
3A	122123-5	T	ND		CELL/GLASS	100	ND		WHITE CEILING TILE
3B	122123-6	T	ND		CELL/GLASS	100	ND		WHITE CEILING TILE
4A	122123-7	P	ND		ND		RUBBER	100	BLACK COVE BASE
4B	122123-8	P	ND		ND		RUBBER	100	BLACK COVE BASE
5A	122123-9	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
5B	122123-10	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
6A	122123-11	P	ND		ND		RUBBER	100	BROWN COVE BASE
6B	122123-12	P	ND		ND		RUBBER	100	BROWN COVE BASE
7A	122123-13	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
7B	122123-14	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
8A	122123-15	P	ND		ND		RUBBER	100	BROWN COVE BASE
8B	122123-16	P	ND		ND		RUBBER	100	BROWN COVE BASE
9A	122123-17	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
9B	122123-18	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
10A	122123-19	P	ND		ND		MIN	100	BROWN/GRAY/BLACK TERRAZZO
10B	122123-20	P	ND		ND		MIN	100	BROWN/GRAY/BLACK TERRAZZO
11A	122123-21	P	ND		ND		MIN	100	GRAY PLASTER

LAB DIRECTOR: Matthew Smith Date: 12/19/23

Method Code: P - Friable PLM result N - NOB PLM result T - TEM result IN* - Inconclusive G - Gravametric Matrix Reduction where sample residue weight is less than 1% of original sample weight, TEM not required.
Terms: ND** - None Detected CELL - Cellulose JC - Joint Compound MIN - Mineral GLASS - Fiberglass <1** - Trace PLAS - Plaster Vermiculite - Vermiculite is reported as an asbestos-containing mineral in accordance with NYSDOH determinations and requirements. See NYSDOH guidance, available upon request.

* "Polarized-light microscopy (PLM) is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can be used to determine if this material can be considered to be non-asbestos containing."
** Please note: Due to interference from sample matrix components results reported via PLM method ELAP 198.1 as negative (ND) or less than 1% (Trace) may be inaccurate and reported as a False Negative. It is recommended that additional analytical techniques such as gravimetric reduction, TEM and others be used to reduce obscuring effects of some matrix components yielding more accurate results.

LaBella Lab Bulk Sample Asbestos Analytical Report

LBL JOB # 1,22123

Client Code:

CLIENT: Labella Associates

Project Number: 2233600

PROJECT LOCATION: 124 Meadow Hill Road, Newburgh, NY

Field ID	LBL ID	Method	Asbestos Type	%	Other Fibers	%	Matrix	%	Color/Description
11B	122123-22	P	ND		ND		MIN	100	GRAY PLASTER
11C	122123-23	P	ND		ND		MIN	100	GRAY PLASTER
12A	122123-24	P	ND		ND		MIN	100	GRAY PLASTER
12B	122123-25	P	ND		ND		MIN	100	GRAY PLASTER
12C	122123-26	P	ND		ND		MIN	100	GRAY PLASTER

LAB DIRECTOR: Matthew Smith Date: 12/19/23

Method Code: P - Friable PLM result N - NOB PLM result T - TEM result IN* - Inconclusive G - Gravametric Matrix Reduction where sample residue weight is less than 1% of original sample weight, TEM not required.
Terms: ND** - None Detected CELL - Cellulose JC - Joint Compound MIN - Mineral GLASS - Fiberglass <1** - Trace PLAS - Plaster
Vermiculite - Vermiculite is reported as an asbestos-containing mineral in accordance with NYSDOH determinations and requirements. See NYSDOH guidance, available upon request.

* "Polarized-light microscopy (PLM) is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can be used to determine if this material can be considered to be non-asbestos containing."
** Please note: Due to interference from sample matrix components results reported via PLM method ELAP 198.1 as negative (ND) or less than 1% (Trace) may be inaccurate and reported as a False Negative. It is recommended that additional analytical techniques such as gravimetric reduction, TEM and others be used to reduce obscuring effects of some matrix components yielding more accurate results.

LaBella
Powered by partnership.

300 State St. Suite 201
Rochester, NY 14614
Ph. 585-454-6110
Labellapc.com

CHAIN OF CUSTODY

Please RUSH

Project #:	2233600	Project Address:	124 Meadow Hill Rd, Newburgh NY 12550
Client:	Newburgh Enlarged CSD	Contact:	Cameron Heller
Date:	12/15/2023	Rates:	12/20/35
Labella Lab #:	122123	# of Samples:	

Lab ID #	Sample #	Type of Material	Sample Location
T 1	1A	Gray AC Caulk	Room 225
T 2	1B		Room 233
T 3	2A	White 2x4 Pinhole and Fissure Ceiling Tile	1st Floor Corridor
T 4	2B		1st Floor Corridor
T 5	3A	White 2x4 Pinhole and Large Fissure Ceiling Tile	2nd Floor Corridor
T 6	3B		2nd Floor Corridor
P 7	4A	Black Cove Base	Choir
P 8	4B		Choir
T 9	5A	Tan with Brown Comingled Cove Base Adhesive	Choir
T 10	5B		Choir
P 11	6A	Light Brown Cove Base	Room 139
P 12	6B		Band
T 13	7A	Tan with Brown Comingled Cove Base Adhesive	Room 139
T 14	7B		Band
P 15	8A	Brown Cove Base	Room 126B
P 16	8B		Room 126B
T # 17	9A	Tan with Brown Comingled Cove Base Adhesive	Room 126B
T # 18	9B		Room 126B
P 19	10A	Brown with Gray and Black Terrazzo	Room 17
P 20	10B		Room 17
P 21	11A	Gray Plaster Base Coat	Room 235A
P 22	11B		Room 235A
P 23	11C		Room 235A
P 24	12A	Gray Plaster Top Coat	Room 235A
P 25	12B		Room 235A
P 26	12C		Room 235A

Positive Stop: ☑ Email Results To: cheller@labellapc.com

Sampled By:	Cameron Heller	Print Name:	Cameron Heller	Date:
Relinquished By:		Print Name:	Cameron Heller	Date: 12/15/23
Received By:		Print Name:	M Leith	Date: 12/18/23

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: Labella Associates (1126)
Address: 300 State Street
Rochester, NY 14614-1098

Attn:

Project: Meadow Hill
Location: Newburgh NY
Number: 2233600

Order #: 543770

Matrix Bulk
Received 12/16/23
Reported 12/20/23

PO Number:

Sample ID / Parameter	Cust. Sample ID / Method	Result	RL*	Units	Analysis Date	Analyst
543770-001	1					
Semi-volatile Organic Compounds						
Aroclor - 1016	SW846 8082A	**<478**	478	µg/kg	12/20/23	KM
Aroclor - 1221	SW846 8082A	**<478**	478	µg/kg	12/20/23	KM
Aroclor - 1232	SW846 8082A	**<478**	478	µg/kg	12/20/23	KM
Aroclor - 1242	SW846 8082A	**<478**	478	µg/kg	12/20/23	KM
Aroclor - 1248	SW846 8082A	**<478**	478	µg/kg	12/20/23	KM
Aroclor - 1254	SW846 8082A	**<478**	478	µg/kg	12/20/23	KM
Aroclor - 1260	SW846 8082A	**<478**	478	µg/kg	12/20/23	KM
Aroclor - 1262	SW846 8082A	**<478**	478	µg/kg	12/20/23	KM
Aroclor - 1268	SW846 8082A	**<478**	478	µg/kg	12/20/23	KM

543770-12/20/23 05:14 PM

Reviewed By: **Ben Wood**
Laboratory Director

Surrogate Recoveries

543770-001 - PCB

DCB	MI
TCMX	MI

All internal QC parameters were met. Unusual sample conditions, if any, are described. Surrogate Spike results designated with "D" indicate that the analyte was diluted out. "MI" indicates matrix interference. Concentration and *Reporting Limit (RL) based on areas provided by client. Values are reported to three significant figures. Solid PPM = mg/kg | PPB = µg/kg and Water PPM = mg/L | PPB = µg/L. The test results apply to the sample as received.

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: Labella Associates (1126)
Address: 300 State Street
Rochester, NY 14614-1098

Attn:

Project: Meadow Hill
Location: Newburgh NY
Number: 2233600

Order #: 543770

Matrix Bulk
Received 12/16/23
Reported 12/20/23

PO Number:

Sample ID / Parameter	Cust. Sample ID / Method	Location	Result	RL*	Units	Analysis Date	Analyst

State Certifications

Method	Parameter	New York	Virginia
SW846 8082A	Aroclor - 1016	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1221	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1232	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1242	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1248	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1254	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1260	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1262	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1268	ELAP Certified	VELAP Certified

State	Certificate Number
New York	ELAP 66375
Virginia	VELAP 12664

All internal QC parameters were met. Unusual sample conditions, if any, are described. Surrogate Spike results designated with "D" indicate that the analyte was diluted out. "MI" indicates matrix interference. Concentration and *Reporting Limit (RL) based on areas provided by client. Values are reported to three significant figures. Solid PPM = mg/kg | PPB = µg/kg and Water PPM = mg/L | PPB = µg/L. The test results apply to the sample as received.

SCHNEIDER LABORATORIES, INC.

2512 West Cary Street, Richmond, Virginia 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475
www.slabinc.com e-mail: info@slabinc.com

WO Label: S 1
543770
V:\543\543770
gbenu 12/16/2023 10:43:53 AM
Federal Express 774503560567

Submitting Co.	Labella Associates DPC	Lab Use-WO #	
300 State Street		Acct #	
Rochester NY 14614		Phone #	8454164989
		Fax # & E-mail	cheller@labellapc.com
Project Name:	Meadow Hill		
Project Location:	Newburgh, NY		
Project Number:	2233600		
Purchase Order No.:			
TAT Requested	(Business Day) ☐ 1 ☐ 2 ☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other:		

Special Instructions [include requests for special reporting or data packages]

Please analyze for PCB

State Of Collection: NY

Sample #	Date Sampled	Time Sampled	# containers	composite	grab	Matrix: aqueous	soil / sludge	air	wipe	oil	solid	Analysis Request: BTEX 602 ☐ MTBE ☐ Naphthalene ☐	Purgeable Aromatics 8021 ☐	Petrol Hydrocarbons GC 8015M Diesel ☐ 8020M Gas ☐	TPH 418.1 ☐	Corrosivity ☐ Reactivity ☐ Flashpoint, Closed Cup ☐	Volatile Organics 624 ☐ 8260 ☐	Semivolatile Organics 625 ☐ 8270 ☐	PAHs 610 ☐ 8270 ☐ 8310 By HPLC ☐	TCLP Semi-Vols ☐ BNAs ☐ Pest ☐ Herb ☐ VOAs ☐ Full ☐	Pesticides 608 ☐ 8081 ☐ Herbicides 8151 ☐ PCB's 8082 ☒	Other/IH Method
1	12/14/23	9:30pm	1		X						X										X	

Sampled by
NAME Cameron Heller
SIGNATURE
DATE/TIME 12/14/23

Relinquished to lab by
NAME Cameron Heller
SIGNATURE
DATE/TIME 12/15/23

Preserved ☐ Yes ☐ No ☐ Ambient temp ☐ Ice °C pH Cl ☐R ☐S ☐X

☐ FX
☐ UPS
☐ USM
☐ HD
☐ DB

WB:

Chain-of-Custody documentation continued internally within lab. Terms and conditions page 2.

APPENDIX E:

LICENSES AND CERTIFICATIONS

WE ARE YOUR DOL

NEW YORK STATE | Department of Labor

DIVISION OF SAFETY & HEALTH LICENSE AND CERTIFICATE UNIT, STATE OFFICE CAMPUS, BLDG. 12, ALBANY, NY 12226

ASBESTOS HANDLING LICENSE

LaBella Associates, D.P.C.
300 State Street, Suite 201, Rochester, NY, 14614

License Number: 29278
License Class: RESTRICTED
Date of Issue: 03/24/2023
Expiration Date: 03/31/2024
Duly Authorized Representative: Greg Senecal

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

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2024
Issued April 01, 2022
Revised March 30, 2023

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

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

MR. MATTHEW SMITH
LABELLA ASSOCIATES
300 STATE STREET SUITE 200
ROCHESTER, NY 14614

NY Lab Id No: 11184

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
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)

Serial No.: 66308

Property of the New York State Department of Health. Certificates are valid only at the address shown and must be conspicuously posted by the laboratory. Continued accreditation depends on the laboratory's successful ongoing participation in the Program. Consumers may verify a laboratory's accreditation status online at https://apps.health.ny.gov/pubdoh/applinks/wc/elappublicweb/, by phone (518) 485-5570 or by email to elap@health.ny.gov.

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2024
Issued April 01, 2022
Revised March 30, 2023

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

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

MICHAEL GREENBERG
AMA ANALYTICAL SERVICES INC
4475 FORBES BLVD
LANHAM, MD 20706

NY Lab Id No: 10920

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:

Metals I

Lead, Total	EPA 7000B

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
Lead in Dust Wipes	EPA 7000B
Lead in Paint	EPA 7000B

Sample Preparation Methods

	ASTM E-1979-17

Serial No.: 66247

Property of the New York State Department of Health. Certificates are valid only at the address shown and must be conspicuously posted by the laboratory. Continued accreditation depends on the laboratory's successful ongoing participation in the Program. Consumers may verify a laboratory's accreditation status online at https://apps.health.ny.gov/pubdoh/applinks/wc/elappublicweb/, by phone (518) 485-5570 or by email to elap@health.ny.gov.

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2024
Issued April 01, 2022
Revised March 30, 2023

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

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

MR. FAYEZ ABOUZAKI
SCHNEIDER LABORATORIES GLOBAL, INC
2512 WEST CARY STREET
RICHMOND, VA 23220-5117

NY Lab Id No: 11413

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

Characteristic Testing

TCLP	EPA 1311

Metals I

Barium, Total	EPA 6010D
Cadmium, Total	EPA 6010D
Calcium, Total	EPA 6010D
Chromium, Total	EPA 6010D
Copper, Total	EPA 6010D
Iron, Total	EPA 6010D
Lead, Total	EPA 6010D
	EPA 7000B
Magnesium, Total	EPA 6010D
Manganese, Total	EPA 6010D
Nickel, Total	EPA 6010D
Potassium, Total	EPA 6010D
Silver, Total	EPA 6010D
Sodium, Total	EPA 6010D

Metals II

Aluminum, Total	EPA 6010D
Antimony, Total	EPA 6010D
Arsenic, Total	EPA 6010D
Beryllium, Total	EPA 6010D
Chromium VI	EPA 7196A
Mercury, Total	EPA 7471B
Selenium, Total	EPA 6010D
Vanadium, Total	EPA 6010D
Zinc, Total	EPA 6010D

Serial No.: 66375

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All approved analytes are listed below:

Metals III

Cobalt, Total	EPA 6010D
Molybdenum, Total	EPA 6010D
Thallium, Total	EPA 6010D
Tin, Total	EPA 6010D
Titanium, Total	EPA 6010D

Miscellaneous

Boron, Total	EPA 6010D

Polychlorinated Biphenyls

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

Sample Preparation Methods

	EPA 3010A
	EPA 3050B
	EPA 3550C

Serial No.: 66375

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2512 WEST CARY STREET
RICHMOND, VA 23220-5117

NY Lab Id No: 11413

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

Sample Preparation Methods

EPA 3050B
ASTM E-1979-17
ME-003-20-002

Serial No.: 66376

Property of the New York State Department of Health. Certificates are valid only at the address shown and must be conspicuously posted by the laboratory. Continued accreditation depends on the laboratory's successful ongoing participation in the Program. Consumers may verify a laboratory's accreditation status online at https://apps.health.ny.gov/pubdoh/applinks/wc/elappublicweb/, by phone (518) 485-5570 or by email to elap@health.ny.gov.

United States Environmental Protection Agency

This is to certify that

LaBella Associates, D.P.C.

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

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 26, 2024

LBP-2226-2

Certification #

August 24, 2021

Issued On

Michelle Price, Chief

Lead, Heavy Metals, and Inorganics Branch

United States Environmental Protection Agency

This is to certify that



Cameron M Heller

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

Risk Assessor

In the Jurisdiction of:

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

This certification is valid from the date of issuance and expires December 02, 2023

LBP-R-I175673-2

Certification #

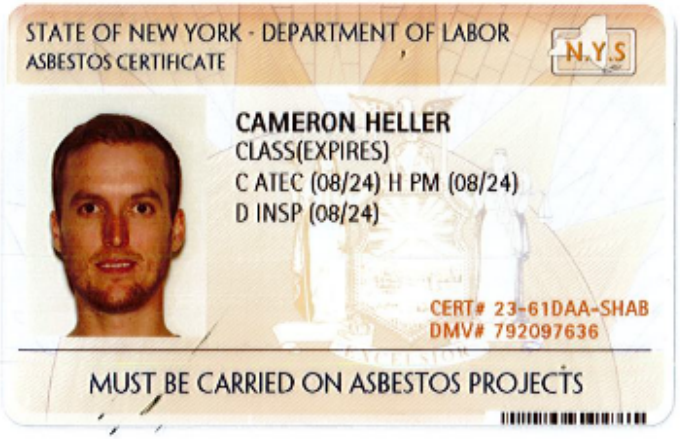
September 21, 2020

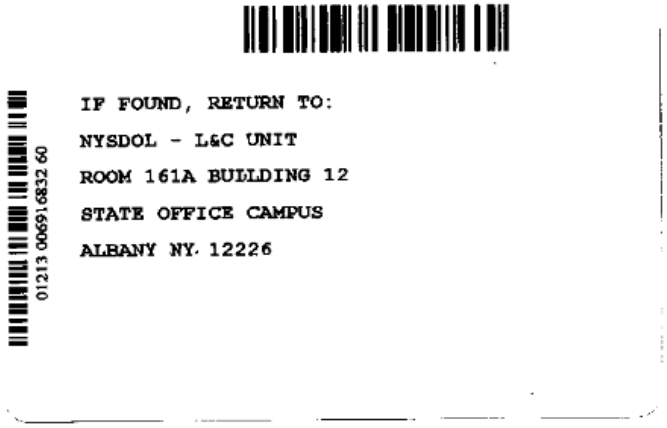
Issued On

Ben Conetta, Chief

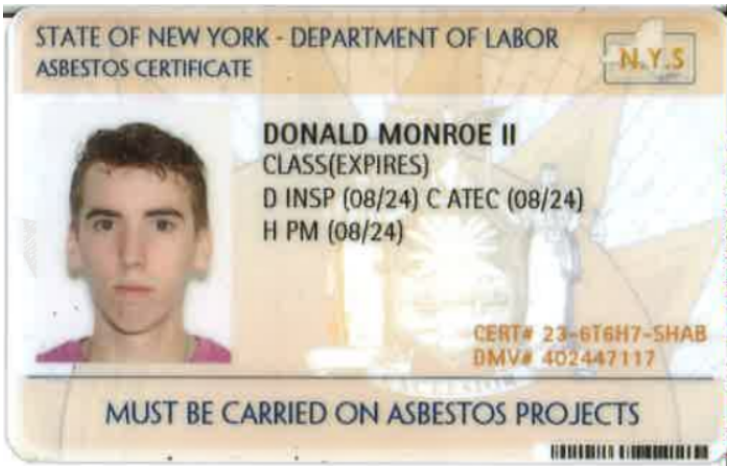
Chemicals and Multimedia Programs Branch

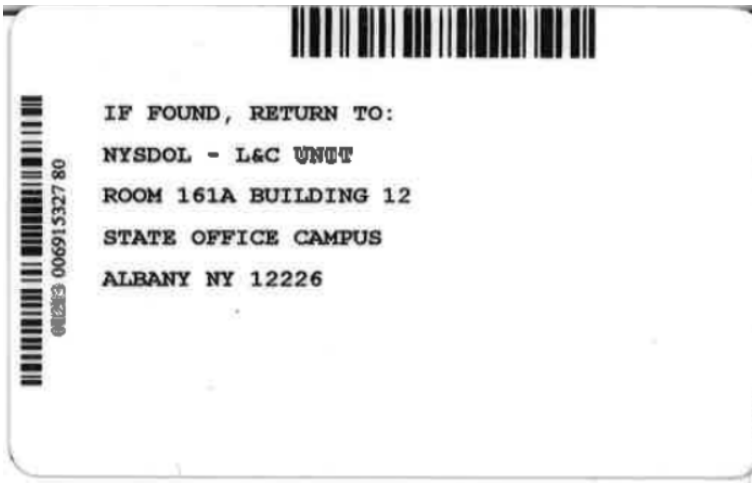
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STATE OFFICE CAMPUS
ALBANY NY 12226

ATTACHMENT B:

PRE-RENOVATION REGULATED BUILDING MATERIALS INSPECTION REPORT – TEMPLE HILL SCHOOL

Limited Pre-Renovation
Regulated Building Materials Inspection

Location:

Temple Hill School
525 Union Avenue
New Windsor, New York 12553

Prepared for:

Newburgh Enlarged City School District
124 Grand Street
Newburgh, New York 12550

LaBella Project No.

2233600

December 21, 2023

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1.0 PROJECT DESCRIPTION

In accordance with current regulations, LaBella Associates, D.P.C. (LaBella) conducted a Limited Pre-Renovation Regulated Building Materials (RBM) Inspection of the Temple Hill School located at 525 Union Ave., New Windsor, New York. The objective was to identify suspect RBMs, such as Asbestos-Containing Materials (ACM), Lead-Based Paint (LBP), PCB-containing materials and equipment that may require abatement or removal prior to or during renovation due to applicable regulations.

The areas inspected were limited to the interior of the Temple Hill School that are expected to be impacted during an upcoming districtwide AC electrical upgrade project. Materials and locations understood to be impacted by this project were determined from information provided by the Newburgh Enlarged City School District and LaBella's Architectural Department.

2.0 INSPECTION PROCEDURES

The following procedures were used to obtain the data for this Report:

A. An AHERA report titled "Newburgh Enlarged City School District Temple Hill School", prepared on November 29, 2006, was reviewed to develop an understanding of the previously sampled materials and confirmed ACMs at the Site.

B. A visual inspection of areas impacted by the upcoming districtwide AC electrical upgrade project was conducted to identify visible and accessible sources of the above referenced suspect RBMs. Photographs captured during this inspection are attached in Appendix C.

C. Bulk samples of accessible suspect materials were collected and submitted for laboratory analysis.

D. Asbestos samples were submitted for laboratory analysis. Preliminary Polarized Light Microscopy analyses were performed by LaBella Laboratories, a NYSDOH accredited laboratory, to determine the presence and percentage of asbestos in each sample. Transmission electron microscopy analyses of NOB materials, if necessary, were performed by AMA Laboratories.

E. Suspect painted or glazed materials were spot checked in the field using XRF testing procedures for the presence of lead.

F. Results of the laboratory analyses, field testing and the visual on-site inspection were compiled and summarized.

3.0 INSPECTION LIMITATIONS

This inspection was conducted in accordance with generally accepted environmental engineering practices for this region. Collection of bulk samples of suspect RBMs was limited to those materials readily accessible using hand tools or hand-held power tools. Homogeneous materials were identified and located based on visual observation from readily accessible points. The data derived from representative samples of any given homogeneous material represent conditions that apply only at that particular location. Inspection protocol and methodology requires that sample data be used to draw conclusions about the entire homogeneous area, but such conclusions may not necessarily apply to the general Site as a whole.

No sub-surface investigations were performed to determine the possible presence of regulated materials on or in the immediate vicinity of the Site. No record drawings of the building were available for review as part of this investigation.

LaBella makes no other warranty or representation, either expressed or implied, nor is one intended to be included as part of its services, proposals, contracts, or reports. No inspection can wholly eliminate the uncertainty regarding the potential for undiscovered RBMs. The Work performed by LaBella is intended to reduce, but not eliminate, uncertainty regarding the potential for RBMs at the Site. This inspection report is not intended to be a bid document for an abatement scope of work. This report is intended to satisfy the requirements of NYS Code Rule 56-5 for asbestos inspections. Abatement project design can only be performed by a certified Project Designer.

Roofing Systems

Due to the risk of voiding the manufacturer's/contractor's roof warranty, LaBella did not perform core sampling of the roofing systems to sample suspect materials. Prior to any renovation/ demolition activities that may disturb roofing materials, additional investigation, including bulk sampling/analysis of suspect roofing materials shall be conducted.

4.0 INSPECTION RESULTS

4.1 Asbestos-Containing Materials (ACMs)

Based on laboratory analyses of bulk samples collected, none of the materials tested were determined to contain asbestos. However, the previous AHERA report identifies multiple ACMs, which are summarized in the table below. Additionally, the roofing system, Materials associated with the AHUs, exterior louver caulking, and exterior waterproofing membrane are assumed to contain asbestos until sampling can be performed. For a full list of materials sampled, please refer to the *Asbestos Bulk Sample Summary Table*.

Type of Material	Typical Location[1]	Estimated Amount[2]	Friability	Condition
MATERIALS IDENTIFIED IN THE 2006 AHERA REPORT				
Mudded Pipe Fittings Associated with AHU Hot Water Lines	Gymnasium and stage	Unknown	Friable	Good
9" Floor Tile and Associated Mastic	*See Description Below*	Unknown	Non-Friable	Good
Block Paint	*See Description Below*	Unknown	Non-Friable*	Good
Black Sink Undercoating	Science Labs Underside of Sinks	4 SF	Non-Friable	Good

*This material is considered to be non-friable in its current, intact condition. However, this material has the potential to become friable during any renovation/demolition activities that will disturb the material.

ACM Project Specific Details

Floor Tile and Associated Mastic

Various colored 9" asbestos-containing floor tiles and the associated asbestos-containing mastic are located throughout the school. Based on field observations made at the time of inspection, in areas where the 9" floor tiles were not visible, it is assumed that the 9" floor tiles are located under newer 12" floor tiles. Field observations also revealed that these materials are present under unit ventilators throughout the school. Where accessible, the floor tiles and mastic were generally in good condition.

[1] Typical Location may not be inclusive of all material locations present at the subject structure.
[2] For general reference only: Quantities reflect only those materials understood to be impacted by the project. Estimated amounts of confirmed ACM listed above were obtained through field observations made during site visits. Quantities are approximations and LaBella assumes no responsibility if used for bidding.

Block Paint

Asbestos-containing block paint was identified in the AHERA report as being located on block walls throughout the school. Based on information outlined in the AHERA report, it is assumed that the AC block paint is present beneath other layers of non-ACM paint. It is assumed that the ACM block paint is present in all areas scheduled to be impacted by the upcoming districtwide AC electrical upgrade project.

4.2 PCB-Containing Materials

Caulking and Glazing Compounds

According to the Environmental Protection Agency (EPA), PCB-containing building materials were commonly used in buildings built or renovated between circa 1950 and 1979. Caulking and glazing compounds were often used around windows, door frames, building joints, masonry columns and other masonry building materials. PCBs from manufactured sources (caulk), may also contaminate adjoining materials, such as masonry or wood, through direct contact and create secondary sources.

As such, prior to removal, the EPA recommends testing caulk and other building materials to determine what protections are needed during removal, and to determine proper disposal requirements. Building materials (caulking, sealants, etc.) containing equal to or greater than 50 ppm PCB must be disposed of as PCB-Contaminated hazardous waste in accordance with 40 CFR part 761, subpart D. Therefore, the following suspect building materials were sampled and analyzed for the presence of PCBs:

- Gray caulking located around air-conditioning units (1)

Based on laboratory analysis, this caulking compound is *not* considered to be PCB-Contaminated (i.e., NOT $\geq$ 50 ppm PCBs). When removed, the caulk may be disposed of as construction and demolition debris.

4.3 Lead – Based Paint

Several representative interior painted surfaces were observed and tested for the presence of lead-based paint using XRF testing procedures. In accordance with Environmental Protection Agency (EPA) protocols, no materials were observed or tested which contain lead above the action level threshold of 1.0 mg/cm^2. However, additional lead-based materials may exist within the school. Therefore, contractors shall be responsible for determining the quantity, location and condition of materials not tested during this inspection.

For a full list of materials and components tested during this inspection, please refer to the XRF Lead Sampling Summary Table immediately following this report.

The building inspected for this project includes spaces applicable to the requirements of EPA 40 Code of Federal Regulations (CFR) 745: Lead-Based Paint Renovation, Repair and Painting (RRP) Program Rule. The RRP Rule affects any contractor who disturbs known or presumed lead-based paint during any renovation, repair or painting projects in housing, childcare facilities, and preschools built before 1978. Any contractor performing renovation work in applicable areas throughout the building must be certified, assign a "certified renovator" to each job where lead-based paint will likely be disturbed, train its renovation workers, distribute the EPA's Renovate Right lead hazard pamphlet before starting work, and use lead safe work practices.

Additionally, lead was detected at low concentrations in a variety of other building materials. Renovation and demolition contractors should be informed of the presence of lead for OSHA compliance considerations.

For purposes of reading this report, and understanding which wall or component in a particular space was sampled, walls were assigned the letters A, B, C, or D. The wall labeled as "A" is the address side of the building; walls B, C, and D will follow clockwise in succession.

5.0 OBSERVATIONS AND CAUTIONARY STATEMENTS

Vermiculite

Vermiculite has been used as loose insulation in attics, walls, CMU block, and as a component of plaster, fireproofing and other building materials. The NYS Department of Health considers loose-fill Vermiculite to be an asbestos-containing material, and that building materials containing Vermiculite should be treated as asbestos-containing until sent for additional analysis and proven negative in accordance with NYS DOH guidelines.

Vermiculite was not observed in spaces and materials inspected for this project. However, destructive investigation of wall cavities was not conducted, and therefore the presence or extent of this material's application throughout the building was not determined.

Cautionary measures should be taken during construction, renovation, and demolition to ensure that proper steps are taken if Vermiculite is discovered in previously inaccessible locations. If Vermiculite is discovered, work should be stopped immediately to address the issue and prevent the uncontrolled release and distribution of an asbestos-containing material.

Exterior Waterproofing Membrane

Waterproofing membranes are often installed between exterior and interior walls to prevent water from migrating into the building from exterior facades. Although a waterproofing membrane was not observed during this inspection, destructive investigation of exterior walls was not performed, and therefore the presence or extent of this material's application throughout the building was not determined. Until destructive investigation can occur, it should be assumed that a waterproofing membrane is present between exterior and interior walls throughout the school. This material should be treated as asbestos-containing until sampling and subsequent analysis determines the membrane to be non-asbestos containing.

Cautionary measures should be taken during construction, renovation, and demolition to ensure that proper steps are taken if a waterproofing membrane is discovered in previously inaccessible locations. If a suspect material is discovered, work should be stopped immediately to address the issue and prevent the uncontrolled release and distribution of a potential asbestos-containing material.

Potentially Hidden/Inaccessible RBMs

As stated earlier, collection of bulk samples of suspect RBMs was limited to those materials readily accessible. Since the building is occupied and in operation as a school open to the public, destructive sampling techniques were limited in order to minimize disruption to school operations and damage to building components.

Although this inspection was conducted in a manner consistent with recognized professional practices, the potential does exist for additional RBMs to be inaccessible, hidden, and undiscovered in the area inspected.

Asbestos Bulk Sample Summary Table

Asbestos Bulk Sample Summary Table

Limited Pre-Renovation Regulated Building Materials Inspection
525 Union Ave., New Windsor, New York 12553

No Asbestos Detected in Any of the Materials Tested

Sample #	*Type of Material*	*Sample Location*	*Results % Asbestos*
1A	Black Cove Base	Room 123	NAD
1B	Black Cove Base	Room 220	NAD
2A	Brown Cove Base Adhesive	Room 123	NAD
2B	Brown Cove Base Adhesive	Room 220	NAD
3A	Tan Cove Base	Room 4	NAD
3B	Tan Cove Base	Room 2	NAD
4A	Tan with Brown Comingled Cove Base Adhesive	Room 4	NAD
4B	Tan with Brown Comingled Cove Base Adhesive	Room 2	NAD
5A	Gray Air-Conditioning Unit Caulk	Room 231	NAD
5B	Gray Air-Conditioning Unit Caulk	Room 225	NAD
6A	White Plaster Topcoat	Room 237	NAD
6B	White Plaster Topcoat	Room 237	NAD
6C	White Plaster Topcoat	Room 237	NAD
7A	Gray Plaster Basecoat	Room 237	NAD
7B	Gray Plaster Basecoat	Room 237	NAD
7C	Gray Plaster Basecoat	Room 237	NAD
8A	Brown Cove Base	Room 135A	NAD
8B	Brown Cove Base	Room 135A	NAD
9A	Tan with Brown Comingled Cove Base Adhesive	Room 135A	NAD

Asbestos Bulk Sample Summary Table

Limited Pre-Renovation Regulated Building Materials Inspection
525 Union Ave., New Windsor, New York 12553

No Asbestos Detected in Any of the Materials Tested

Sample #	*Type of Material*	*Sample Location*	*Results % Asbestos*
9B	Tan with Brown Comingled Cove Base Adhesive	Room 135A	NAD
10A	Gray Cove Base	Room 2A	NAD
10B	Gray Cove Base	Room 2A	NAD
11A	Tan with Brown Comingled Cove Base Adhesive	Room 2A	NAD
11B	Tan with Brown Comingled Cove Base Adhesive	Room 2A	NAD
12A	White 2x4 Fissure and Pinhole Ceiling Tile	Corridor 241	NAD
12B	White 2x4 Fissure and Pinhole Ceiling Tile	Corridor 241	NAD
13A	6-Inch Black Cove Base	Room 17	NAD
13B	6-Inch Black Cove Base	Room 17	NAD
14A	Tan with Residual Brown Adhesive Associated with 6” Black Cove Base	Room 17	NAD
14B	Tan with Residual Brown Adhesive Associated with 6” Black Cove Base	Room 17	NAD
15A	White Large Fissure and Pinhole 4x2 Ceiling Tile	2nd Floor Corridor	NAD
15B	White Large Fissure and Pinhole 4x2 Ceiling Tile	2nd Floor Corridor	NAD

XRF Lead Sampling Summary Table

XRF Lead Sampling Summary Table
Canandaigua Operation – Transportation Center
215 Granger Street, Canandaigua, New York 14424
LaBella Project No. 2200128

Reading No.	Location (Room)	Wall (A, B, C D) & Structure	Substrate	Color	XRF Result
153	Calibration	---	---	---	Pass
154	Calibration	---	---	---	Pass
155	Calibration	---	---	---	Pass
156	Calibration	---	---	---	Pass
157	218	A	Block	White I	0
158	218	A	Metal	Off-white I	0
159	218	D	Metal	Off-white I	0
160	218	D	Block	Off-white I	0
161	219	B	Block	Off-white I	0
162	219	A	Metal	Off-white I	0
163	221	A	Block	Off-white I	0
164	221	A	Metal	Off-white I	0
165	221	D	Metal	Black I	0
166	223	D	Metal	Off-white I	0
167	223	D	Block	Off-white I	0
168	225	D	Block	Off-white I	0
169	225	D	Block	Blue I	0
170	220	B	Block	Off-white I	0
171	220	B	Metal	Off-white I	0
172	227	D	Metal	Off-white I	0
173	227	D	Block	Off-white I	0.2
174	222	B	Block	Off-white I	0
175	222	B	Metal	Black I	0
176	229a	D	Metal	Black I	0

I = Intact Condition. No visible damage or deterioration
P = Poor Condition. Paint is chipped, peeling, or otherwise damaged

XRF Lead Sampling Summary Table
Canandaigua Operation – Transportation Center
215 Granger Street, Canandaigua, New York 14424
LaBella Project No. 2200128

Reading No.	Location (Room)	Wall (A, B, C D) & Structure	Substrate	Color	XRF Result
177	229a	D	Block	Off-white I	0
178	230	B	Block	Off-white I	0
179	229	D	Block	Off-white I	0.3
180	231	D	Block	White I	0.3
181	231	D	Metal	Off-white I	0
182	231a	D	Block	Off-white I	0
183	233	D	Block	White I	0.4
184	233	D	Metal	Black I	0
185	Asst. Principal	C	Block	Gray I	0
186	Asst. Principal	D	Block	Dark Blue I	0
187	235a	C	Block	Off-white I	0.1
188	235a	C	Metal	Off-white I	0
189	235b	C	Block	Off-white I	0.2
190	224	A	Block	Off-white I	0.3
191	226	A	Block	Off-white I	0
192	226	A	Block	Blue I	0
193	226	A	Metal	Tan I	0
194	237	C	Metal	Black I	0
195	237	C	Metal	Off-white I	0
196	228	A	Block	White I	0
197	228	A	Block	Blue I	0
198	239	C	Block	White I	0
199	241	D	Metal	Dark Blue I	0
200	241	D	Metal	Dark Blue I	1.1
201	241	D	Metal	Dark Blue I	1

I = Intact Condition. No visible damage or deterioration
P = Poor Condition. Paint is chipped, peeling, or otherwise damaged

XRF Lead Sampling Summary Table
Canandaigua Operation – Transportation Center
215 Granger Street, Canandaigua, New York 14424
LaBella Project No. 2200128

Reading No.	Location (Room)	Wall (A, B, C D) & Structure	Substrate	Color	XRF Result
202	241	D	Metal	Dark Blue I	1.1
203	241	D	Metal	Dark Blue I	1.1
204	121	A	Metal	White I	0
205	121	A	Block	White I	0
206	123	D	Block	White I	0
207	123	D	Block	Off-white I	0
208	123	D	Metal	Brown I	0
209	125a	D	Metal	Off-white I	0
210	125a	D	Metal	Black I	0
211	125a	D	Block	White I	0
212	125b	D	Block	Off-white I	0
213	120	B	Block	White I	0.3
214	120	B	Metal	Dark Blue I	0
215	127	D	Metal	Off-white I	0
216	127	D	Metal	Black I	0
217	127	D	Metal	Off-white I	0
218	129	D	Block	White I	0
219	131b	D	Block	White I	0
220	133	D	Block	White I	0
221	133	D	Block	White I	0
222	133	D	Block	Black I	0
223	131a	D	Metal	White I	0
224	135a	C	Block	Off-white I	0.1
225	135b	C	Block	White I	0.2
226	124	A	Block	White I	0

I = Intact Condition. No visible damage or deterioration
P = Poor Condition. Paint is chipped, peeling, or otherwise damaged

XRF Lead Sampling Summary Table
Canandaigua Operation – Transportation Center
215 Granger Street, Canandaigua, New York 14424
LaBella Project No. 2200128

Reading No.	Location (Room)	Wall (A, B, C D) & Structure	Substrate	Color	XRF Result
227	126a	A	Block	White I	0.3
228	126a	A	Metal	White I	0
229	139	C	Metal	White I	0
230	139	C	Metal	Black I	0
231	139	C	Block	White I	0
232	126b	A	Block	White I	0.2
233	141	C	Block	White I	0
234	141	C	Metal	White I	0
235	137	C	Block	White I	0
236	24	C	Block	White I	0.1
237	Gym	A	Metal	Off-white I	0
238	1	B	Block	Off-white I	0
239	1	B	Metal	Off-white I	0
240	7	A	Metal	Off-white I	0
241	7	A	Block	Off-white I	0
242	2	A	Block	Off-white I	0
243	2a	A	Block	White I	0
244	3	A	Block	Off-white I	0
245	3	A	Metal	Black I	0
246	3	A	Metal	Off-white I	0
247	4a	A	Block	Off-white I	0
248	4a	D	Metal	Off-white I	0
249	4	B	Block	Off-white I	0
250	5	B	Block	Tan I	0
251	5	B	Metal	Brown I	0

I = Intact Condition. No visible damage or deterioration
P = Poor Condition. Paint is chipped, peeling, or otherwise damaged

XRF Lead Sampling Summary Table
Canandaigua Operation – Transportation Center
215 Granger Street, Canandaigua, New York 14424
LaBella Project No. 2200128

Reading No.	Location (Room)	Wall (A, B, C D) & Structure	Substrate	Color	XRF Result
252	4b	B	Metal	Dark Blue I	0
253	4b	B	Block	Dark Blue I	0
254	Kindergarten Library	C	Metal	Off-white I	0
255	Kindergarten Library	C	Metal	Black I	0
256	6	B	Metal	Purple I	0
257	6	B	Block	Off-white I	0
258	8	A	Block	Off-white I	0.1
259	9b	A	Block	Off-white I	0
260	9b	A	Metal	Gray I	0
261	10	A	Metal	Dark Blue I	0
262	10	A	Block	Off-white I	0
263	11	A	Block	Off-white I	0
264	11	A	Block	Off-white I	1.1
265	11	A	Block	Off-white I	1.1
266	11	A	Block	Off-white I	1.1
267	11	A	Block	Off-white I	1.1
268	11	A	Block	Off-white I	1.1
269	11	A	Block	Off-white I	1
270	11	A	Block	Off-white I	1.1
271	11	A	Block	Off-white I	1.1
272	11	A	Block	Off-white I	1.1
273	11	A	Block	Off-white I	1.1
274	11	A	Block	Off-white I	1.1
275	11	A	Block	Off-white I	1.1
276	Reading	C	Block	White I	0

I = Intact Condition. No visible damage or deterioration
P = Poor Condition. Paint is chipped, peeling, or otherwise damaged

XRF Lead Sampling Summary Table
Canandaigua Operation – Transportation Center
215 Granger Street, Canandaigua, New York 14424
LaBella Project No. 2200128

Reading No.	Location (Room)	Wall (A, B, C D) & Structure	Substrate	Color	XRF Result
277	Reading	A	Metal	Blue I	0
278	Speech	C	Metal	Brown I	0
279	Speech	C	Block	White I	0
280	12	D	Block	White I	0
281	13	D	Block	Off-white I	0
282	13	D	Metal	Off-white I	0
283	14	D	Metal	Off-white I	0
284	14	D	Block	Off-white I	0
285	15	A	Block	Off-white I	0
286	15	A	Metal	Off-white I	0
287	15	A	Metal	Black I	0
288	16	D	Metal	Off-white I	0
289	16	D	Block	Off-white I	0.1
290	Psychologist	C	Block	Off-white I	0
291	42	A	Block	Off-white I	0
292	42	A	Metal	Off-white I	0
293	42	A	Metal	Off-white I	1
294	42	A	Metal	Off-white I	1.1
295	42	A	Metal	Off-white I	1.1
296	42	A	Metal	Off-white I	1.1
297	42	A	Metal	Off-white I	1.1
298	42	A	Metal	Off-white I	1.1
299	42	A	Metal	Off-white I	1.1
300	42	A	Metal	Off-white I	1.1
301	Music Room 2	C	Metal	Off-white I	0

I = Intact Condition. No visible damage or deterioration
P = Poor Condition. Paint is chipped, peeling, or otherwise damaged

XRF Lead Sampling Summary Table
Canandaigua Operation – Transportation Center
215 Granger Street, Canandaigua, New York 14424
LaBella Project No. 2200128

Reading No.	Location (Room)	Wall (A, B, C D) & Structure	Substrate	Color	XRF Result
302	Music Room 2	C	Metal	Off-white I	0
303	Music Room 2	C	Block	Off-white I	0.3
304	22b	C	Block	Brown I	0.1
305	17	C	Block	Off-white I	0
306	17	C	Metal	Off-white I	0
307	18	C	Metal	Off-white I	0
308	18	C	Metal	Off-white I	0
309	19	C	Metal	Brown I	0
310	19	C	Block	Off-white I	0
311	Calibration	---	---	---	Pass
312	Calibration	---	---	---	Pass
313	Calibration	---	---	---	Pass
314	Calibration	---	---	---	Pass

I = Intact Condition. No visible damage or deterioration
P = Poor Condition. Paint is chipped, peeling, or otherwise damaged

APPENDIX A:
INSPECTION FACT SHEET

Inspection Fact Sheet

Name and Address of Building/Structure

Temple Hill School

525 Union Avenue

New Windsor, New York 12553

Name and Address of Building/Structure Owner

Newburgh Enlarged City School District

124 Grand Street

Newburgh, New York 12550

Name and Address of Owner's Agent

LaBella Associates, D.P.C.

300 State Street, Suite 201

Rochester, New York 14614

Name of the Firm & Person Conducting the Inspection

LaBella Associates, D.P.C.

Cameron Heller *(NYSDOL Cert. #23-61DAA-SHAB)*

Donald Monroe (NYSDOL Cert. #23-6T6H7-SHAB)

Dates the Inspection Was Conducted

December 12 and 13, 2023

APPENDIX B:
SAMPLE LOCATION DRAWINGS

APPENDIX C:
INSPECTION PHOTOS



Photo 1

View of Asbestos-Containing 9” Floor Tile Under 12’ Floor Tile in Classroom



Photo 2

View of Asbestos-Containing Mudded Pipe Fittings in Gym



Photo 3

View of Assumed Asbestos-Containing Roofing System

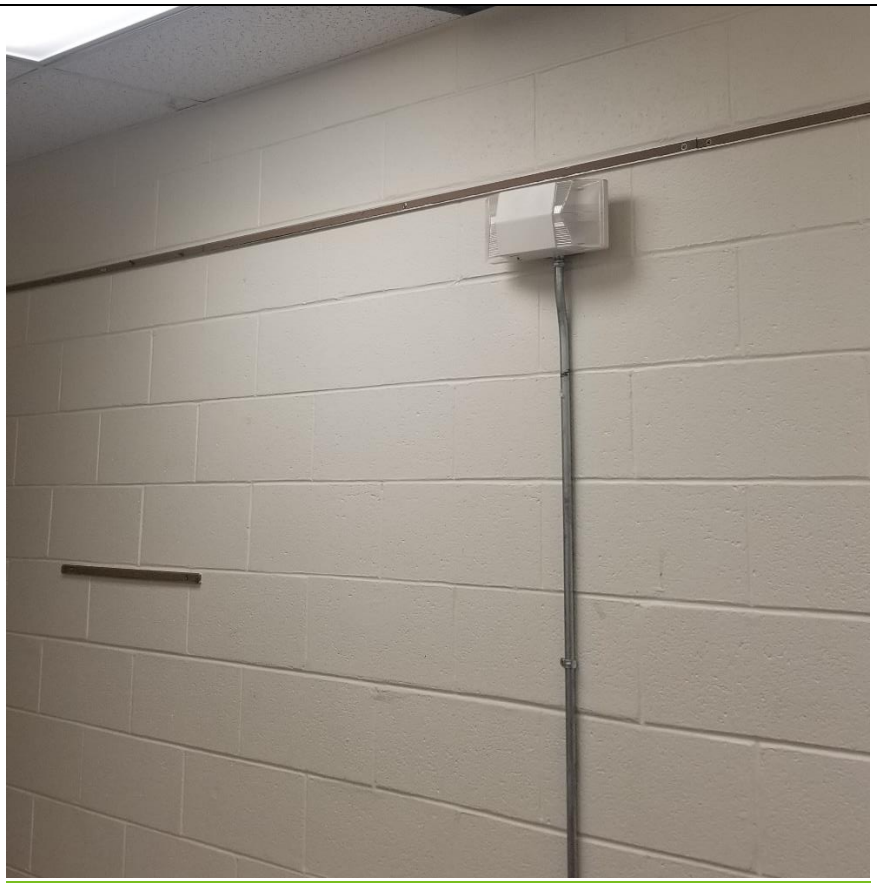


Photo 4

View of Asbestos-Containing Block Paint under Latex Paint

APPENDIX D:
LABORATORY ANALYTICAL REPORTS

Bulk Sample Asbestos Analytical Report

LABELLA ASSOCIATES, DPC
ANALYTICAL LABORATORY
300 STATE STREET
ROCHESTER, NY 14614
585.454.6110 FAX 585.454.3066

LBL ELAP # 11184
All TEM analysis by AMA Lab, ELAP # 10920
PLM Methods: 198.1, 198.4 & 198.6
RSD: 18.3

LBL JOB # 1,22023

Client Code:

CLIENT: Labella Associates
ADDRESS: 300 State Street
Rochester, NY 14614

Project Number: 2233600
Sample Type: PLM Bulk
Sample Date: 12/15/2023

PROJECT LOCATION: 525 Union Ave., New Windsor, NY

Field ID	LBL ID	Method	Asbestos Type	%	Other Fibers	%	Matrix	%	Color/Description
1A	122023-1	P	ND		ND		RUBBER	100	BLACK COVE BASE
1B	122023-2	P	ND		ND		RUBBER	100	BLACK COVE BASE
2A	122023-3	T	ND		ND		MIN/BINDER	100	BROWN MASTIC
2B	122023-4	T	ND		ND		MIN/BINDER	100	BROWN MASTIC
3A	122023-5	P	ND		ND		RUBBER	100	TAN COVE BASE
3B	122023-6	P	ND		ND		RUBBER	100	TAN COVE BASE
4A	122023-7	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
4B	122023-8	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
5A	122023-9	T	ND		ND		MIN/BINDER	100	GRAY CAULK
5B	122023-10	T	ND		ND		MIN/BINDER	100	GRAY CAULK
6A	122023-11	P	ND		ND		MIN	100	WHITE PLASTER
6B	122023-12	P	ND		ND		MIN	100	WHITE PLASTER
6C	122023-13	P	ND		ND		MIN	100	WHITE PLASTER
7A	122023-14	P	ND		ND		MIN	100	GRAY PLASTER
7B	122023-15	P	ND		ND		MIN	100	GRAY PLASTER
7C	122023-16	P	ND		ND		MIN	100	GRAY PLASTER
8A	122023-17	P	ND		ND		RUBBER	100	BROWN COVE BASE
8B	122023-18	P	ND		ND		RUBBER	100	BROWN COVE BASE
9A	122023-19	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
9B	122023-20	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
10A	122023-21	P	ND		ND		RUBBER	100	GRAY COVE BASE

LAB DIRECTOR: Matthew Smith Date: 12/19/23

Method Code: P - Friable PLM result N - NOB PLM result T - TEM result IN* - Inconclusive G - Gravametric Matrix Reduction where sample residue weight is less than 1% of original sample weight, TEM not required.
Terms: ND** - None Detected CELL - Cellulose JC - Joint Compound MIN - Mineral GLASS - Fiberglass <1** - Trace PLAS - Plaster Vermiculite - Vermiculite is reported as an asbestos-containing mineral in accordance with NYSDOH determinations and requirements. See NYSDOH guidance, available upon request.

* "Polarized-light microscopy (PLM) is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can be used to determine if this material can be considered to be non-asbestos containing."
** Please note: Due to interference from sample matrix components results reported via PLM method ELAP 198.1 as negative (ND) or less than 1% (Trace) may be inaccurate and reported as a False Negative. It is recommended that additional analytical techniques such as gravimetric reduction, TEM and others be used to reduce obscuring effects of some matrix components yielding more accurate results.

LaBella Lab Bulk Sample Asbestos Analytical Report

LBL JOB # 1,22023

Client Code:

CLIENT: Labella Associates

Project Number: 2233600

PROJECT LOCATION: 525 Union Ave., New Windsor, NY

Field ID	LBL ID	Method	Asbestos Type	%	Other Fibers	%	Matrix	%	Color/Description
10B	122023-22	P	ND		ND		RUBBER	100	GRAY COVE BASE
11A	122023-23	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
11B	122023-24	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
12A	122023-25	P	ND		GLASS	100	ND		WHITE CEILING TILE
12B	122023-26	P	ND		GLASS	100	ND		WHITE CEILING TILE
13A	122023-27	P	ND		ND		RUBBER	100	BLACK COVE BASE
13B	122023-28	P	ND		ND		RUBBER	100	BLACK COVE BASE
14A	122023-29	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
14B	122023-30	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
15A	122023-31	P	ND		GLASS	100	ND		WHITE CEILING TILE
15B	122023-32	P	ND		GLASS	100	ND		WHITE CEILING TILE

LAB DIRECTOR: Matthew Smith Date: 12/19/23

Method Code: P - Friable PLM result N - NOB PLM result T - TEM result IN* - Inconclusive G - Gravametric Matrix Reduction where sample residue weight is less than 1% of original sample weight, TEM not required.
Terms: ND** - None Detected CELL - Cellulose JC - Joint Compound MIN - Mineral GLASS - Fiberglass <1** - Trace PLAS - Plaster
Vermiculite - Vermiculite is reported as an asbestos-containing mineral in accordance with NYSDOH determinations and requirements. See NYSDOH guidance, available upon request.

* "Polarized-light microscopy (PLM) is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can be used to determine if this material can be considered to be non-asbestos containing."
** Please note: Due to interference from sample matrix components results reported via PLM method ELAP 198.1 as negative (ND) or less than 1% (Trace) may be inaccurate and reported as a False Negative. It is recommended that additional analytical techniques such as gravimetric reduction, TEM and others be used to reduce obscuring effects of some matrix components yielding more accurate results.

LaBella
Powered by partnership.

300 State St. Suite 201
Rochester, NY 14614
Ph. 585-454-6110
Labellapc.com

CHAIN OF CUSTODY

Please Rush

Project #:	2233600	Project Address:	525 Union Ave, New Windsor NY 12553
Client:	Newburgh Enlarged CSD	Contact:	Cameron Heller
Date:	12/15/2023	Rates:	12/20/35
Labella Lab #:	122023	# of Samples:	

Lab ID #	Sample #	Type of Material	Sample Location
P1	1A	Black Cove Base	Room 123
P2	1B		Room 220
T3	2A	Brown Mastic Associated with Black Cove Base	Room 123
T4	2B		Room 220
P5	3A	Tan Cove Base	Room 4
P6	3B		Room 2
T7	4A	Tan Residual Brown Adhesive with Associated with Tan Cove Base	Room 4
T8	4B		Room 2
T9	5A	Gray AC Caulk	Room 231
T10	5B		Room 225
P11	6A	White Plaster Topcoat	Room 237
P12	6B		Room 237
P13	6C		Room 237
P14	7A	Gray Plaster Basecoat	Room 237
P15	7B		Room 237
P16	7C		Room 237
P17	8A	Brown Cove Base	Room 135A
P18	8B		Room 135A
T19	9A	Tan Residual Brown Adhesive with Associated with Brown Cove Base	Room 135A
T20	9B		Room 135A
P21	10A	Gray Cove Base	Room 2A
P22	10B		Room 2A
T23	11A	Tan Residual Brown Adhesive with Associated with Gray Cove Base	Room 2A
T24	11B		Room 2A
P25	12A	White 2x4 Fissured and Pinhole Ceiling Tile	Corridor 241
P26	12B		Corridor 241
P27	13A	6 Inch Black Cove Base	Room 17
P28	13B		Room 17
T29	14A	Tan with Residual Brown Adhesive Associated with 6 Inch Black Cove Base	Room 17
T30	14B		Room 17
P31	15A	white C.T.	2nd Floor Corridor

Positive Stop: ☑ Email Results To: cheller@labellapc.com

Sampled By: Cam Print Name: Cameron Heller Date:

Relinquished By: Print Name: Cameron Heller Date: 12/15/23

Received By: Print Name: M Smith Date: 12/18/23

LaBella
Powered by partnership

300 State St. Suite 201
Rochester, NY 14614
Ph. 585-454-6110
Labellapc.com

CHAIN OF CUSTODY

Project #:	2233600	Project Address:	525 Union Ave, New Windsor NY 12553
Client:	Newburgh Enlarged CSD	Contact:	Cameron Heller
Date:	12/15/2023	Rates:	12/20/35
Labella Lab #:	122023	# of Samples:	

Lab ID #	Sample #	Type of Material	Sample Location
P 32	15B	White Pinhole Large Fissure 4x2 Ceiling Tile	2nd Floor Corridor

Positive Stop: ☑ Email Results To: cheller@labellapc.com

Sampled By:	[signature]	Print Name:	Cameron Heller	Date:	
Relinquished By:	[signature]	Print Name:	Cameron Heller	Date:	12/15/23
Received By:		Print Name:		Date:	

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: Labella Associates (1126)
Address: 300 State Street
Rochester, NY 14614-1098

Attn:

Project: Temple Hill
Location: Newburgh NY
Number: 2233600

Order #: 543769

Matrix Bulk
Received 12/16/23
Reported 12/20/23

PO Number:

Sample ID / Parameter	Cust. Sample ID / Method	Result	RL*	Units	Analysis Date	Analyst
543769-001	5					
Semi-volatile Organic Compounds						
Aroclor - 1016	SW846 8082A	**<494**	494	µg/kg	12/20/23	KM
Aroclor - 1221	SW846 8082A	**<494**	494	µg/kg	12/20/23	KM
Aroclor - 1232	SW846 8082A	**<494**	494	µg/kg	12/20/23	KM
Aroclor - 1242	SW846 8082A	**<494**	494	µg/kg	12/20/23	KM
Aroclor - 1248	SW846 8082A	**<494**	494	µg/kg	12/20/23	KM
Aroclor - 1254	SW846 8082A	**<494**	494	µg/kg	12/20/23	KM
Aroclor - 1260	SW846 8082A	**<494**	494	µg/kg	12/20/23	KM
Aroclor - 1262	SW846 8082A	**<494**	494	µg/kg	12/20/23	KM
Aroclor - 1268	SW846 8082A	**<494**	494	µg/kg	12/20/23	KM

The method spike failed due to possible matrix interference; the results are not affected

543769-12/20/23 05:13 PM

Reviewed By: **Ben Wood**
Laboratory Director

Surrogate Recoveries

543769-001 - PCB

DCB	MI
TCMX	MI

All internal QC parameters were met. Unusual sample conditions, if any, are described. Surrogate Spike results designated with "D" indicate that the analyte was diluted out. "MI" indicates matrix interference. Concentration and *Reporting Limit (RL) based on areas provided by client. Values are reported to three significant figures. Solid PPM = mg/kg | PPB = µg/kg and Water PPM = mg/L | PPB = µg/L. The test results apply to the sample as received.

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: Labella Associates (1126)
Address: 300 State Street
Rochester, NY 14614-1098

Attn:

Project: Temple Hill
Location: Newburgh NY
Number: 2233600

Order #: 543769

Matrix Bulk
Received 12/16/23
Reported 12/20/23

PO Number:

Sample ID / Parameter	Cust. Sample ID / Method	Location	Result	RL*	Units	Analysis Date	Analyst

State Certifications

Method	Parameter	New York	Virginia
SW846 8082A	Aroclor - 1016	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1221	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1232	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1242	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1248	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1254	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1260	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1262	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1268	ELAP Certified	VELAP Certified

State	Certificate Number
New York	ELAP 66375
Virginia	VELAP 12664

All internal QC parameters were met. Unusual sample conditions, if any, are described. Surrogate Spike results designated with "D" indicate that the analyte was diluted out. "MI" indicates matrix interference. Concentration and *Reporting Limit (RL) based on areas provided by client. Values are reported to three significant figures. Solid PPM = mg/kg | PPB = µg/kg and Water PPM = mg/L | PPB = µg/L. The test results apply to the sample as received.

SCHNEIDER LABORATORIES, INC.

2512 West Cary Street, Richmond, Virginia 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475
www.slabinc.com e-mail: info@slabinc.com

WO Label: S 1

543769

V:\543\543769

gbenu 12/16/2023 10:43:53 AM

Federal Express 774503560561

Submitting Co.	Labella Associates DPC	Lab Use-WO #	
300 State Street		Acct #	
Rochester NY 14614		Phone #	8454164989
		Fax # & E-mail	cheller@labellapc.com

Project Name:	Temple Hill
Project Location:	Newburgh, NY
Project Number:	2233600
Purchase Order No.:	
TAT Requested	(Business Day) ☐ 1 ☐ 2 ☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other: ____

Special Instructions [include requests for special reporting or data packages]

Please analyze for PCB

State Of Collection	NY

Analysis Request | **Other/IH Method**

Sample #	Date Sampled	Time Sampled	# containers	composite	grab	Matrix: aqueous	soil / sludge	air	wipe	oil	solid	BTEX 602 ☐ MTBE ☐ Naphthalene ☐	Purgeable Aromatics 8021 ☐	Petrol Hydrocarbons GC 8015M Diesel ☐ 8020M Gas ☐	TPH 418.1 ☐	Corrosivity ☐ Reactivity ☐ Flashpoint, Closed Cup ☐	Volatile Organics 624 ☐ 8260 ☐	Semivolatile Organics 625 ☐ 8270 ☐	PAHs 610 ☐ 8270 ☐ 8310 By HPLC ☐	TCLP Semi-Vols ☐ BNAs ☐ Pest ☐ Herb ☐ VOAs ☐ Full ☐	Pesticides 608 ☐ 8081 ☐ Herbicides 8151 ☐ PCB's 8082 ☒	Other/IH Method
5	12/13/23	8:30pm	1		X						X										X	

Sampled by
NAME Cameron Heller
SIGNATURE
DATE/TIME 12/13/23

Relinquished to lab by
NAME Cameron Heller
SIGNATURE
DATE/TIME 12/15/23

☐ FX
☐ UPS
☐ USM
☐ HD
☐ DB

WB: _____

Preserved ☐ Yes ☐ No ☐ Ambient temp ☐ Ice °C ____ pH ____ Cl ____ ☐R ☐S ☐X

Chain-of-Custody documentation continued internally within lab. Terms and conditions page 2.

APPENDIX E:

LICENSES AND CERTIFICATIONS

WE ARE YOUR DOL

NEW YORK STATE | Department of Labor

DIVISION OF SAFETY & HEALTH LICENSE AND CERTIFICATE UNIT, STATE OFFICE CAMPUS, BLDG. 12, ALBANY, NY 12226

ASBESTOS HANDLING LICENSE

LaBella Associates, D.P.C.
300 State Street, Suite 201, Rochester, NY, 14614

License Number: 29278
License Class: RESTRICTED
Date of Issue: 03/24/2023
Expiration Date: 03/31/2024
Duly Authorized Representative: Greg Senecal

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

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2024
Issued April 01, 2022
Revised March 30, 2023

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

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

MR. MATTHEW SMITH
LABELLA ASSOCIATES
300 STATE STREET SUITE 200
ROCHESTER, NY 14614

NY Lab Id No: 11184

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
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)

Serial No.: 66308

Property of the New York State Department of Health. Certificates are valid only at the address shown and must be conspicuously posted by the laboratory. Continued accreditation depends on the laboratory's successful ongoing participation in the Program. Consumers may verify a laboratory's accreditation status online at https://apps.health.ny.gov/pubdoh/applinks/wc/elappublicweb/, by phone (518) 485-5570 or by email to elap@health.ny.gov.

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2024
Issued April 01, 2022
Revised March 30, 2023

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

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

MICHAEL GREENBERG
AMA ANALYTICAL SERVICES INC
4475 FORBES BLVD
LANHAM, MD 20706

NY Lab Id No: 10920

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:

Metals I

Lead, Total	EPA 7000B

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
Lead in Dust Wipes	EPA 7000B
Lead in Paint	EPA 7000B

Sample Preparation Methods

	ASTM E-1979-17

Serial No.: 66247

Property of the New York State Department of Health. Certificates are valid only at the address shown and must be conspicuously posted by the laboratory. Continued accreditation depends on the laboratory's successful ongoing participation in the Program. Consumers may verify a laboratory's accreditation status online at https://apps.health.ny.gov/pubdoh/applinks/wc/elappublicweb/, by phone (518) 485-5570 or by email to elap@health.ny.gov.

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2024
Issued April 01, 2022
Revised March 30, 2023

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

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

MR. FAYEZ ABOUZAKI
SCHNEIDER LABORATORIES GLOBAL, INC
2512 WEST CARY STREET
RICHMOND, VA 23220-5117

NY Lab Id No: 11413

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

Characteristic Testing

TCLP	EPA 1311

Metals I

Barium, Total	EPA 6010D
Cadmium, Total	EPA 6010D
Calcium, Total	EPA 6010D
Chromium, Total	EPA 6010D
Copper, Total	EPA 6010D
Iron, Total	EPA 6010D
Lead, Total	EPA 6010D
	EPA 7000B
Magnesium, Total	EPA 6010D
Manganese, Total	EPA 6010D
Nickel, Total	EPA 6010D
Potassium, Total	EPA 6010D
Silver, Total	EPA 6010D
Sodium, Total	EPA 6010D

Metals II

Aluminum, Total	EPA 6010D
Antimony, Total	EPA 6010D
Arsenic, Total	EPA 6010D
Beryllium, Total	EPA 6010D
Chromium VI	EPA 7196A
Mercury, Total	EPA 7471B
Selenium, Total	EPA 6010D
Vanadium, Total	EPA 6010D
Zinc, Total	EPA 6010D

Serial No.: 66375

Property of the New York State Department of Health. Certificates are valid only at the address shown and must be conspicuously posted by the laboratory. Continued accreditation depends on the laboratory's successful ongoing participation in the Program. Consumers may verify a laboratory's accreditation status online at https://apps.health.ny.gov/pubdoh/applinks/wc/elappublicweb/, by phone (518) 485-5570 or by email to elap@health.ny.gov.

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All approved analytes are listed below:

Metals III

Cobalt, Total	EPA 6010D
Molybdenum, Total	EPA 6010D
Thallium, Total	EPA 6010D
Tin, Total	EPA 6010D
Titanium, Total	EPA 6010D

Miscellaneous

Boron, Total	EPA 6010D

Polychlorinated Biphenyls

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

Sample Preparation Methods

	EPA 3010A
	EPA 3050B
	EPA 3550C

Serial No.: 66375

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All approved subcategories and/or analytes are listed below:

Miscellaneous

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

Sample Preparation Methods

EPA 3050B
ASTM E-1979-17
ME-003-20-002

Serial No.: 66376

Property of the New York State Department of Health. Certificates are valid only at the address shown and must be conspicuously posted by the laboratory. Continued accreditation depends on the laboratory's successful ongoing participation in the Program. Consumers may verify a laboratory's accreditation status online at https://apps.health.ny.gov/pubdoh/applinks/wc/elappublicweb/, by phone (518) 485-5570 or by email to elap@health.ny.gov.

United States Environmental Protection Agency

This is to certify that

LaBella Associates, D.P.C.

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

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 26, 2024

LBP-2226-2

Certification #

August 24, 2021

Issued On

Michelle Price, Chief

Lead, Heavy Metals, and Inorganics Branch

United States Environmental Protection Agency

This is to certify that



Cameron M Heller

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

Risk Assessor

In the Jurisdiction of:

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

This certification is valid from the date of issuance and expires December 02, 2023

LBP-R-I175673-2

Certification #

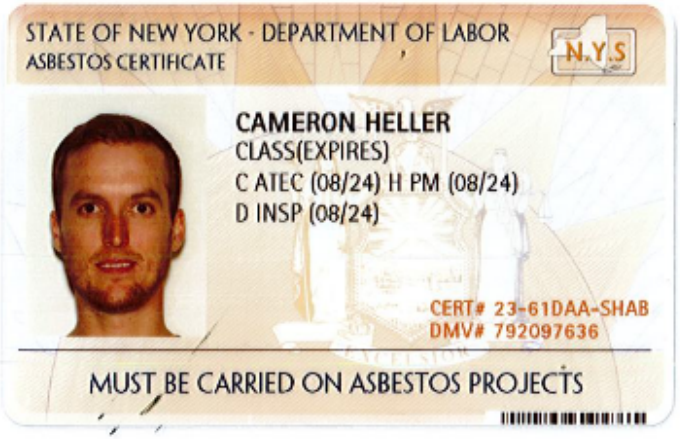
September 21, 2020

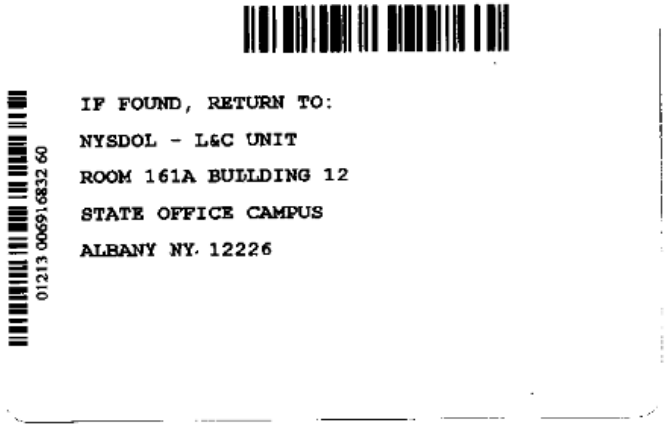
Issued On

Ben Conetta, Chief

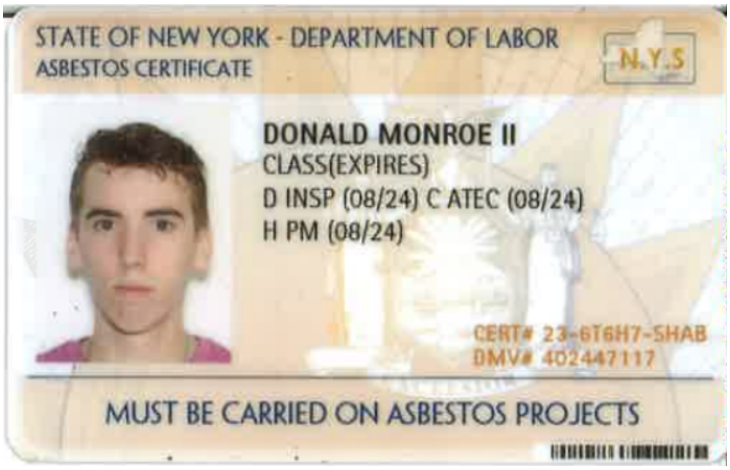
Chemicals and Multimedia Programs Branch

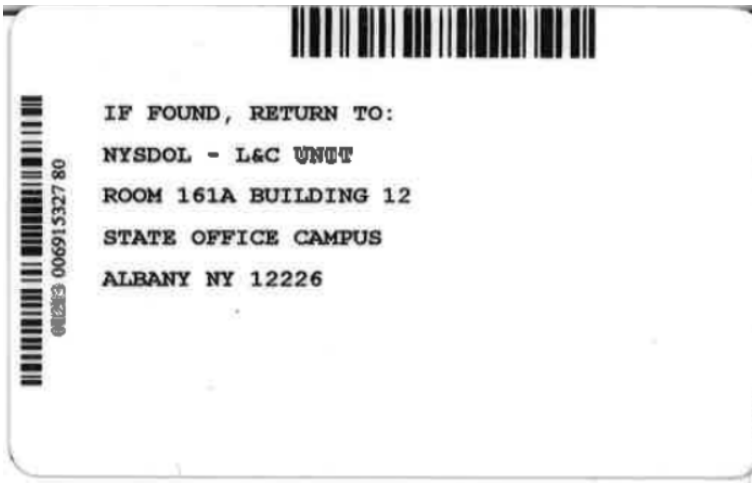
LaBella
Powered by partnership.





5 McCrea Hill Road | Ballston Spa, NY 12020 | p (518) 885-5383 | f (518) 885-5385
www.labellapc.com


STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE
N.Y.S
DONALD MONROE II
CLASS(EXPIRES)
D INSP (08/24) C ATEC (08/24)
H PM (08/24)
CERT# 23-6T6H7-SHAB
DMV# 402447117
MUST BE CARRIED ON ASBESTOS PROJECTS


IF FOUND, RETURN TO:
NYSDOL - L&C UNIT
ROOM 161A BUILDING 12
STATE OFFICE CAMPUS
ALBANY NY 12226

ATTACHMENT C:

PRE-RENOVATION REGULATED BUILDING MATERIALS INSPECTION REPORT – GIDNEY AVENUE MEMORIAL SCHOOL

Limited Pre-Renovation
Regulated Building Materials Inspection

Location:

Gidney Avenue Memorial School
300 Gidney Avenue
Newburgh, New York 12550

Prepared for:

Newburgh Enlarged City School District
124 Grand Street
Newburgh, New York 12550

LaBella Project No.

2233600

December 21, 2023
Revised June 10, 2024

LaBella
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5 McCrea Hill Road | Ballston Spa, NY 12020 | p (518) 885-5383 | f (518) 885-5385
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1.0 PROJECT DESCRIPTION

In accordance with current regulations, LaBella Associates, D.P.C. (LaBella) conducted a Limited Pre-Renovation Regulated Building Materials (RBM) Inspection of the Gidney Avenue Memorial School located at 300 Gidney Avenue, Newburgh, New York. The objective was to identify suspect RBMs, such as Asbestos-Containing Materials (ACM), Lead-Based Paint (LBP), and PCB-containing materials that may require abatement or removal prior to or during renovation due to applicable regulations.

The areas inspected were limited to the interior of the north wing and fan room within the Gidney Avenue Memorial School that are expected to be impacted during an upcoming HVAC renovation project. Materials and locations understood to be impacted by this project were determined from information provided by the Newburgh Enlarged City School District and LaBella's Engineering Department.

2.0 INSPECTION PROCEDURES

The following procedures were used to obtain the data for this Report:

A. An AHERA report titled "Newburgh Enlarged City School District GAMS Tech Magnet School", prepared on November 29, 2006, was reviewed to develop an understanding of the previously sampled materials and confirmed ACMs at the Site.

B. A visual inspection of the areas impacted by the upcoming HVAC renovation project (north wing and fan room only) was conducted to identify visible and accessible sources of the above referenced suspect RBMs.

C. Bulk samples of accessible suspect materials were collected and submitted for laboratory analysis.

D. Asbestos samples were submitted for laboratory analysis. Preliminary Polarized Light Microscopy analyses were performed by LaBella Laboratories, a NYSDOH accredited laboratory, to determine the presence and percentage of asbestos in each sample. Transmission electron microscopy analyses of NOB materials, if necessary, were performed by AMA Laboratories.

E. Suspect painted or glazed materials were spot checked in the field using XRF testing procedures for the presence of lead.

F. Results of the laboratory analyses, field testing and the visual on-site inspection were compiled and summarized.

3.0 INSPECTION LIMITATIONS

This inspection was conducted in accordance with generally accepted environmental engineering practices for this region. Collection of bulk samples of suspect RBMs was limited to those materials readily accessible using hand tools or hand-held power tools. Homogeneous materials were identified and located based on visual observation from readily accessible points. The data derived from representative samples of any given homogeneous material represent conditions that apply only at that particular location. Inspection protocol and methodology requires that sample data be used to draw conclusions about the entire homogeneous area, but such conclusions may not necessarily apply to the general Site as a whole.

No sub-surface investigations were performed to determine the possible presence of regulated materials on or in the immediate vicinity of the Site. No record drawings of the building were available for review as part of this investigation.

LaBella makes no other warranty or representation, either expressed or implied, nor is one intended to be included as part of its services, proposals, contracts, or reports. No inspection can wholly eliminate the uncertainty regarding the potential for undiscovered RBMs. The Work performed by LaBella is intended to reduce, but not eliminate, uncertainty regarding the potential for RBMs at the Site. This inspection report is not intended to be a bid document for an abatement scope of work. This report is intended to satisfy the requirements of NYS Code Rule 56-5 for asbestos inspections. Abatement project design can only be performed by a certified Project Designer.

Roofing Systems

Due to the risk of voiding the manufacturer's/contractor's roof warranty, LaBella did not perform core sampling of the roofing systems to sample suspect materials. Prior to any renovation/ demolition activities that may disturb roofing materials, additional investigation, including bulk sampling/analysis of suspect roofing materials shall be conducted.

4.0 INSPECTION RESULTS

4.1 Asbestos-Containing Materials (ACMs)

Based on laboratory analyses of bulk samples collected, none of the materials tested were determined to contain asbestos. Additionally, the 2006 AHERA report did not identify any known or assumed asbestos-containing materials scheduled to be impacted by this project. For a full list of materials sampled during this inspection, please refer to the *Asbestos Bulk Sample Summary Table*.

Special Note: The roofing system and exterior waterproofing membrane are assumed to contain asbestos until sampling can be performed.

4.2 PCB-Containing Materials

Caulking and Glazing Compounds

According to the Environmental Protection Agency (EPA), PCB-containing building materials were commonly used in buildings built or renovated between circa 1950 and 1979. Caulking and glazing compounds were often used around windows, door frames, building joints, masonry columns and other masonry building materials. PCBs from manufactured sources (caulk), may also contaminate adjoining materials, such as masonry or wood, through direct contact and create secondary sources.

As such, prior to removal, the EPA recommends testing caulk and other building materials to determine what protections are needed during removal, and to determine proper disposal requirements. Building materials (caulking, sealants, etc.) containing equal to or greater than 50 ppm PCB must be disposed of as PCB-Contaminated hazardous waste in accordance with 40 CFR part 761, subpart D.

No suspect PCB-Containing Materials were identified within the renovation areas.

4.3 Lead – Based Paint

Several representative interior painted surfaces were observed and tested for the presence of lead-based paint using XRF testing procedures. In accordance with Environmental Protection Agency (EPA) protocols, no materials were observed or tested which contain lead above the action level threshold of 1.0 mg/cm^2. However, additional lead-based materials may exist within the school. Therefore, contractors shall be responsible for determining the quantity, location and condition of materials not tested during this inspection.

For a full list of materials and components tested during this inspection, please refer to the *XRF Lead Sampling Summary Table* immediately following this report.

The building inspected for this project includes spaces applicable to the requirements of EPA 40 Code of Federal Regulations (CFR) 745: Lead-Based Paint Renovation, Repair and Painting (RRP) Program Rule. The RRP Rule affects any contractor who disturbs known or presumed lead-based paint during any renovation, repair or painting projects in housing, childcare facilities, and preschools built before 1978. Any contractor performing renovation work in applicable areas throughout the building must be certified, assign a "certified renovator" to each job where lead-based paint will likely be disturbed, train its renovation workers, distribute the EPA's Renovate Right lead hazard pamphlet before starting work, and use lead safe work practices.

Additionally, lead was detected at low concentrations in a variety of other building materials. Renovation and demolition contractors should be informed of the presence of lead for OSHA compliance considerations.

For purposes of reading this report, and understanding which wall or component in a particular space was sampled, walls were assigned the letters A, B, C, or D. The wall labeled as "A" is the address side of the building; walls B, C, and D will follow clockwise in succession.

5.0 OBSERVATIONS AND CAUTIONARY STATEMENTS

Vermiculite

Vermiculite has been used as loose insulation in attics, walls, CMU block, and as a component of plaster, fireproofing and other building materials. The NYS Department of Health considers loose-fill Vermiculite to be an asbestos-containing material, and that building materials containing Vermiculite should be treated as asbestos-containing until sent for additional analysis and proven negative in accordance with NYS DOH guidelines.

Vermiculite was not observed in spaces and materials inspected for this project. However, destructive investigation of wall cavities was not conducted, and therefore the presence or extent of this material's application throughout the building was not determined.

Cautionary measures should be taken during construction, renovation, and demolition to ensure that proper steps are taken if Vermiculite is discovered in previously inaccessible locations. If Vermiculite is discovered, work should be stopped immediately to address the issue and prevent the uncontrolled release and distribution of an asbestos-containing material.

Exterior Waterproofing Membrane

Waterproofing membranes are often installed between exterior and interior walls to prevent water from migrating into the building from exterior facades. Although a waterproofing membrane was not observed during this inspection, destructive investigation of exterior walls was not performed, and therefore the presence or extent of this material's application throughout the building was not determined. Until destructive investigation can occur, it should be assumed that a waterproofing membrane is present between exterior and interior walls throughout the school. This material should be treated as asbestos-containing until sampling and subsequent analysis determines the membrane to be non-asbestos containing.

Cautionary measures should be taken during construction, renovation, and demolition to ensure that proper steps are taken if a waterproofing membrane is discovered in previously inaccessible locations. If a suspect material is discovered, work should be stopped immediately to address the issue and prevent the uncontrolled release and distribution of a potential asbestos-containing material.

Potentially Hidden/Inaccessible RBMs

As stated earlier, collection of bulk samples of suspect RBMs was limited to those materials readily accessible. Since the building is occupied and in operation as a school open to the public, destructive sampling techniques were limited in order to minimize disruption to school operations and damage to building components.

Although this inspection was conducted in a manner consistent with recognized professional practices, the potential does exist for additional RBMs to be inaccessible, hidden, and undiscovered in the area inspected.

Asbestos Bulk Sample Summary Table

Asbestos Bulk Sample Summary Table

Limited Pre-Renovation Regulated Building Materials Inspection
Gidney Avenue Memorial School
300 Gidney Avenue - Newburgh, New York 12550

No Asbestos Detected in Any of the Materials Tested

Sample #	*Type of Material*	*Sample Location*	*Results % Asbestos*
1A	Gray Muddled 12" Floor Tile	Room 116	NAD
1B	Gray Muddled 12" Floor Tile	Room 111	NAD
2A	Black Mastic Associated with Gray Muddled 12" Floor Tile	Room 116	NAD
2B	Black Mastic Associated with Gray Muddled 12" Floor Tile	Room 111	NAD
3A	Gray Cove Base	Room 111	NAD
3B	Gray Cove Base	Room 110	NAD
4A	Tan Adhesive Associated with Gray Cove Base	Room 111	NAD
4B	Tan Adhesive Associated with Gray Cove Base	Room 110	NAD
5A	White with Pink 12" Floor Tile	Room A14	NAD
5B	White with Pink 12" Floor Tile	Room A14	NAD
6A	Black Mastic Associated with White and Pink 12" Floor Tile	Room A14	NAD
6B	Black Mastic Associated with White and Pink 12" Inch Floor Tile	Room A14	NAD
7A	Tan Cove Base	Room A14	NAD
7B	Tan Cove Base	Room A14	NAD
8A	Tan with Brown Comingled Cove Base Adhesive	Room A14	NAD
8B	Tan with Brown Comingled Cove Base Adhesive	Room A14	NAD
9A	Red UV Cover Adhesive	Room 116	NAD
9B	Red UV Cover Adhesive	Room 110	NAD

Asbestos Bulk Sample Summary Table

Limited Pre-Renovation Regulated Building Materials Inspection
Gidney Avenue Memorial School
300 Gidney Avenue - Newburgh, New York 12550

No Asbestos Detected in Any of the Materials Tested

Sample #	*Type of Material*	*Sample Location*	*Results % Asbestos*
10A	White 2x2 Pinhole and Fissure Ceiling Tile	Corridor C-Side	NAD
10B	White 2x2 Pinhole and Fissure Ceiling Tile	Corridor A-Side	NAD
11A	White Block Paint	Room 110	NAD
11B	White Block Paint	Room 113	NAD
11C	White Block Paint	Room 114	NAD
12A	Yellow Block Paint	Room A14	NAD
12B	Yellow Block Paint	Room 109	NAD
12C	Yellow Block Paint	Room 109A	NAD
13A	Off-White Pipe TSI Paper Backing	Fan Room Center	NAD
13B	Off-White Pipe TSI Paper Backing	Fan Room Center	NAD
13C	Off-White Pipe TSI Paper Backing	Fan Room North	NAD
14A	Off-White Duct Insulation Jacket	Fan Room Southern Unit	NAD
14B	Off-White Duct Insulation Jacket	Fan Room Southern Unit	NAD
14C	Off-White Duct Insulation Jacket	Fan Room Northern Unit	NAD
15A	White TSI Paper Backing	Fan Room South	NAD
15B	White TSI Paper Backing	Fan Room Center	NAD
15C	White TSI Paper Backing	Fan Room North	NAD
16A	White Vinyl Duct Insulation Backing	Fan Room South	NAD
16B	White Vinyl Duct Insulation Backing	Fan Room South	NAD

Asbestos Bulk Sample Summary Table

Limited Pre-Renovation Regulated Building Materials Inspection
Gidney Avenue Memorial School
300 Gidney Avenue - Newburgh, New York 12550

No Asbestos Detected in Any of the Materials Tested

Sample #	*Type of Material*	*Sample Location*	*Results % Asbestos*
16C	White Vinyl Duct Insulation Backing	Fan Room South	NAD
17A	Off-White Pipe Insulation End Sealant	Fan Room Center	NAD
17B	Off-White Pipe Insulation End Sealant	Fan Room Center	NAD
18A	White Pipe Insulation End Sealant	Fan Room North	NAD
18B	White Pipe Insulation End Sealant Backing	Fan Room North	NAD
19A	White Pinhole Ceiling Tile	Gymnasium Classroom	NAD
19B	White Pinhole Ceiling Tile	Gymnasium Classroom	NAD
20A	White Gypsum Ceiling Board	Gymnasium Classroom	NAD
20B	White Gypsum Ceiling Board	Gymnasium Classroom	NAD
21A	Gray Gypsum Wall Board	Gymnasium Classroom	NAD
21B	Gray Gypsum Wall Board	Gymnasium Classroom	NAD
22A	Tan Seam Tape	Gymnasium Classroom	NAD
22B	Tan Seam Tape	Gymnasium Classroom	NAD
23A	White Joint Compound	Gymnasium Classroom	NAD
23B	White Joint Compound	Gymnasium Classroom	NAD
24A	Yellow Fiberglass Backing	Gymnasium Classroom	NAD
24B	Yellow Fiberglass Backing	Gymnasium Classroom	NAD
24C	Yellow Fiberglass Backing	Gymnasium Classroom	NAD

XRF Lead Sampling Summary Table

XRF Lead Sampling Summary Table
Canandaigua Operation – Transportation Center
215 Granger Street, Canandaigua, New York 14424
LaBella Project No. 2200128

Reading No.	Location (Room)	Wall (A, B, C D) & Structure	Substrate	Color	XRF Result
315	Calibration	---	---	---	Pass
316	Calibration	---	---	---	Pass
317	Calibration	---	---	---	Pass
318	Calibration	---	---	---	Pass
319	111	C	Block	White I	0
320	111	C	Metal	Gray I	0
321	111	C	Metal	Gray I	0
322	109a	A	Block	Off-white I	0
323	109	A	Block	Off-white I	0
324	113	B	Block	White I	0
325	115	B	Block	White I	0
326	115	B	Metal	Gray I	0
327	110	A	Metal	Gray I	0
328	110	A	Block	White I	0
329	117	A	Block	Blue I	0
330	117	B	Metal	Gray I	0
331	119	A	Metal	Gray I	0
332	119	B	Block	Green I	0
333	123	B	Block	Off-white I	0
334	122	B	Block	Off-white I	0
335	124	C	Block	Blue I	0
336	124	C	Metal	Gray I	0
337	121	C	Metal	Gray I	0
338	121	C	Block	Gray I	0

I = Intact Condition. No visible damage or deterioration
P = Poor Condition. Paint is chipped, peeling, or otherwise damaged

XRF Lead Sampling Summary Table
Canandaigua Operation – Transportation Center
215 Granger Street, Canandaigua, New York 14424
LaBella Project No. 2200128

Reading No.	Location (Room)	Wall (A, B, C D) & Structure	Substrate	Color	XRF Result
339	125	B	Block	Off-white I	0
340	120	B	Block	Off-white I	0
341	118	D	Block	Off-white I	0
342	118	D	Block	Off-white I	0
343	116	D	Block	Off-white I	0
344	114	D	Block	White I	0
345	114	D	Metal	Gray I	0
346	112	D	Metal	Gray I	0
347	112	D	Block	White I	0
348	Calibration	---	---	---	Pass
349	Calibration	---	---	---	Pass
350	Calibration	---	---	---	Pass
351	Calibration	---	---	---	Pass

I = Intact Condition. No visible damage or deterioration
P = Poor Condition. Paint is chipped, peeling, or otherwise damaged

APPENDIX A:
INSPECTION FACT SHEET

Inspection Fact Sheet

Name and Address of Building/Structure

Gidney Avenue Memorial School

300 Gidney Avenue

Newburgh, New York 12550

Name and Address of Building/Structure Owner

Newburgh Enlarged City School District

124 Grand Street

Newburgh, New York 12550

Name and Address of Owner's Agent

LaBella Associates, D.P.C.

300 State Street, Suite 201

Rochester, New York 14614

Name of the Firm & Person Conducting the Inspection

LaBella Associates, D.P.C.

Cameron Heller *(NYSDOL Cert. #23-61DAA-SHAB)*

Donald Monroe (NYSDOL Cert. #23-6T6H7-SHAB)

Date the Inspection Was Conducted

December 14,2023 and January 26, 2024

APPENDIX B:

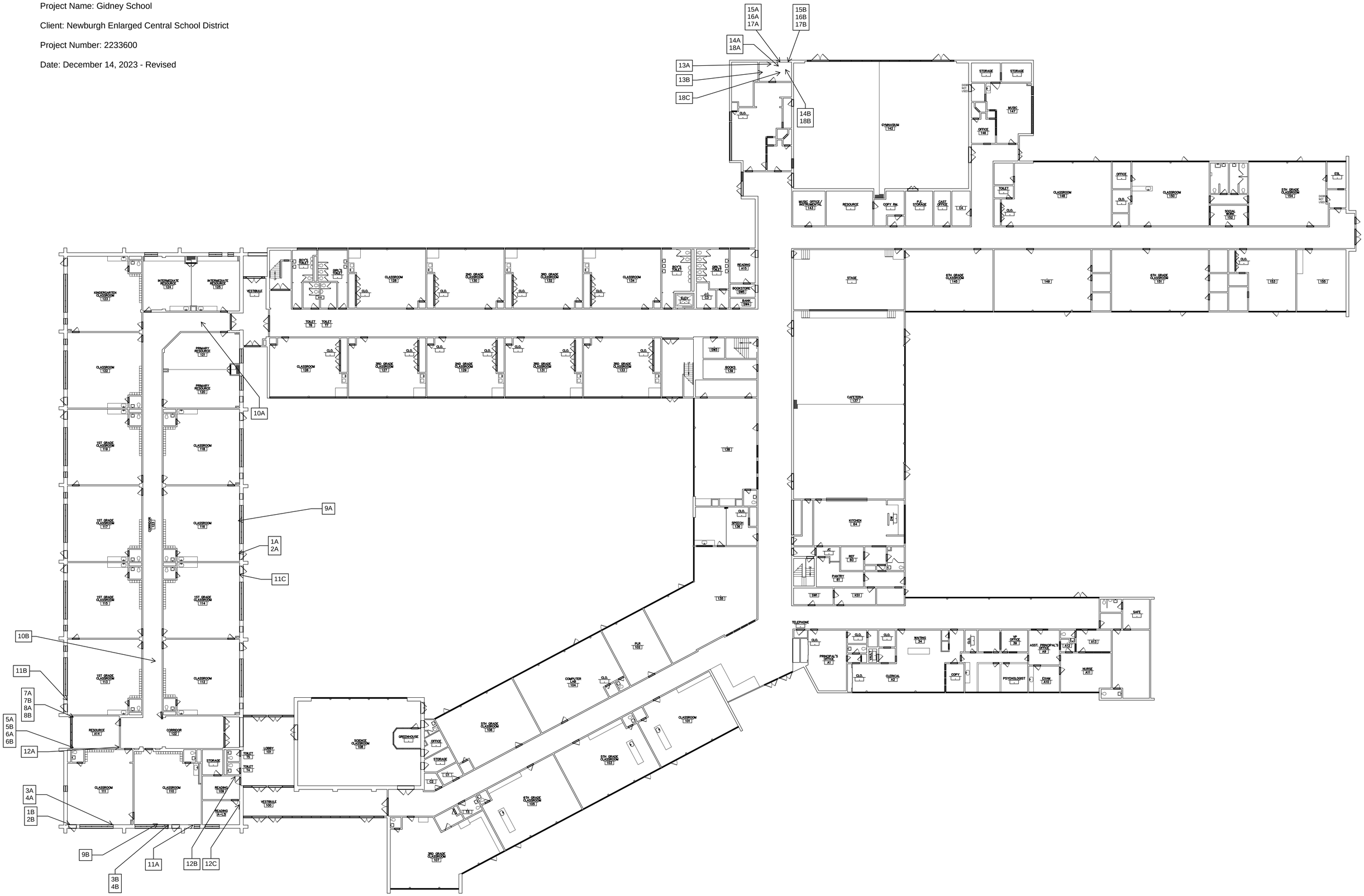
SAMPLE LOCATION DRAWING

Project Name: Gidney School

Client: Newburgh Enlarged Central School District

Project Number: 2233600

Date: December 14, 2023 - Revised



Legend

= Sample Location (Non-ACM)

= Sample Location (ACM)

1 / - EXISTING FIRST FLOOR PLAN

SCALE: 1/16" = 1'-0"

NORTH

APPENDIX C:
INSPECTION PHOTOS



Photo 1

View of Assumed Asbestos-Containing Roofing System

APPENDIX D:
LABORATORY ANALYTICAL REPORTS

Bulk Sample Asbestos Analytical Report

LABELLA ASSOCIATES, DPC
ANALYTICAL LABORATORY
300 STATE STREET
ROCHESTER, NY 14614
585.454.6110 FAX 585.454.3066

LBL ELAP # 11184
All TEM analysis by AMA Lab, ELAP # 10920
PLM Methods: 198.1, 198.4 & 198.6
RSD: 18.3

LBL JOB # 1,21923

Client Code:

CLIENT: Labella Associates
ADDRESS: 300 State Street
Rochester, NY 14614

Project Number: 2233600
Sample Type: PLM Bulk
Sample Date: 12/15/2023

PROJECT LOCATION: 300 Gidney Ave., Newburgh, NY

Field ID	LBL ID	Method	Asbestos Type	%	Other Fibers	%	Matrix	%	Color/Description
1A	121923-1	T	ND		ND		MIN/VINYL	100	GRAY FLOOR TILE
1B	121923-2	T	ND		ND		MIN/VINYL	100	GRAY FLOOR TILE
2A	121923-3	G	ND		ND		MASTIC	100	BLACK MASTIC
2B	121923-4	G	ND		ND		MASTIC	100	BLACK MASTIC
3A	121923-5	P	ND		ND		RUBBER	100	GRAY COVE BASE
3B	121923-6	P	ND		ND		RUBBER	100	GRAY COVE BASE
4A	121923-7	T	ND		ND		MIN/BINDER	100	TAN ADHESIVE
4B	121923-8	T	ND		ND		MIN/BINDER	100	TAN ADHESIVE
5A	121923-9	T	ND		ND		MIN/VINYL	100	WHITE FLOOR TILE
5B	121923-10	T	ND		ND		MIN/VINYL	100	WHITE FLOOR TILE
6A	121923-11	G	ND		ND		MASTIC	100	BLACK MASTIC
6B	121923-12	G	ND		ND		MASTIC	100	BLACK MASTIC
7A	121923-13	P	ND		ND		RUBBER	100	TAN COVE BASE
7B	121923-14	P	ND		ND		RUBBER	100	TAN COVE BASE
8A	121923-15	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
8B	121923-16	T	ND		ND		MIN/BINDER	100	TAN/BROWN ADHESIVE
9A	121923-17	T	ND		ND		MIN/BINDER	100	RED ADHESIVE
9B	121923-18	T	ND		ND		MIN/BINDER	100	RED ADHESIVE
10A	121923-19	T	ND		CELL/GLASS	100	ND		WHITE CEILING TILE
10B	121923-20	T	ND		CELL/GLASS	100	ND		WHITE CEILING TILE
11A	121923-21	P	ND		ND		MIN	100	WHITE PAINT CHIPS

LAB DIRECTOR: Matthew Smith Date: 6/10/24

Method Code: P - Friable PLM result N - NOB PLM result T - TEM result IN* - Inconclusive G - Gravametric Matrix Reduction where sample residue weight is less than 1% of original sample weight, TEM not required.
Terms: ND** - None Detected CELL - Cellulose JC - Joint Compound MIN - Mineral GLASS - Fiberglass <1** - Trace PLAS - Plaster
Vermiculite - Vermiculite is reported as an asbestos-containing mineral in accordance with NYSDOH determinations and requirements. See NYSDOH guidance, available upon request.

* "Polarized-light microscopy (PLM) is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can be used to determine if this material can be considered to be non-asbestos containing."
** Please note: Due to interference from sample matrix components results reported via PLM method ELAP 198.1 as negative (ND) or less than 1% (Trace) may be inaccurate and reported as a False Negative. It is recommended that additional analytical techniques such as gravimetric reduction, TEM and others be used to reduce obscuring effects of some matrix components yielding more accurate results.

LaBella Lab Bulk Sample Asbestos Analytical Report

LBL JOB # 1,21923

Client Code:

CLIENT: Labella Associates

Project Number: 2233600

PROJECT LOCATION: 300 Gidney Ave., Newburgh, NY

Field ID	LBL ID	Method	Asbestos Type	%	Other Fibers	%	Matrix	%	Color/Description
11B	121923-22	P	ND		ND		MIN	100	WHITE PAINT CHIPS
11C	121923-23	P	ND		ND		MIN	100	WHITE PAINT CHIPS
12A	121923-24	P	ND		ND		MIN	100	YELLOW PAINT CHIPS
12B	121923-25	P	ND		ND		MIN	100	YELLOW PAINT CHIPS
12C	121923-26	P	ND		ND		MIN	100	YELLOW PAINT CHIPS
13A	121923-27	P	ND		CELL/GLASS	50	BINDER	50	WHITE TSI BACKING
13B	121923-28	P	ND		CELL/GLASS	50	BINDER	50	WHITE TSI BACKING
13C	121923-29	P	ND		CELL/GLASS	50	BINDER	50	WHITE TSI BACKING
14A	121923-30	P	ND		CELL/GLASS	50	BINDER	50	WHITE INSULATION JACKET
14B	121923-31	P	ND		CELL/GLASS	50	BINDER	50	WHITE INSULATION JACKET
14C	121923-32	P	ND		CELL/GLASS	50	BINDER	50	WHITE INSULATION JACKET
15A	121923-33	P	ND		CELL/GLASS	50	BINDER	50	WHITE TSI BACKING
15B	121923-34	P	ND		CELL/GLASS	50	BINDER	50	WHITE TSI BACKING
15C	121923-35	P	ND		CELL/GLASS	50	BINDER	50	WHITE TSI BACKING
16A	121923-36	P	ND		CELL/GLASS	50	BINDER	50	WHITE INSULATION JACKET
16B	121923-37	P	ND		CELL/GLASS	50	BINDER	50	WHITE INSULATION JACKET
16C	121923-38	P	ND		CELL/GLASS	50	BINDER	50	WHITE INSULATION JACKET
17A	121923-39	P	ND		CELL/GLASS	20	MIN	80	WHITE END SEALANT
17B	121923-40	P	ND		CELL/GLASS	20	MIN	80	WHITE END SEALANT
18A	121923-41	P	ND		CELL/GLASS	20	MIN	80	WHITE END SEALANT
18B	121923-42	P	ND		CELL/GLASS	20	MIN	80	WHITE END SEALANT
19A	121923-43	T	ND		CELL/GLASS	100	ND		WHITE CEILING TILE
19B	121923-44	T	ND		CELL/GLASS	100	ND		WHITE CEILING TILE
20A	121923-45	P	ND		CELL/GLASS	2	MIN	98	WHITE GYPSUM CEILING BOARD
20B	121923-46	P	ND		CELL/GLASS	2	MIN	98	WHITE GYPSUM CEILING BOARD
21A	121923-47	P	ND		CELL	2	MIN	98	GRAY GYPSUM WALL BOARD
21B	121923-48	P	ND		CELL	2	MIN	98	GRAY GYPSUM WALL BOARD
22A	121923-49	P	ND		CELL	100	ND		TAN SEAM TAPE

LAB DIRECTOR: Matthew Smith Date: 6/10/24

Method Code: P - Friable PLM result N - NOB PLM result T - TEM result IN* - Inconclusive G - Gravametric Matrix Reduction where sample residue weight is less than 1% of original sample weight, TEM not required.
Terms: ND** - None Detected CELL - Cellulose JC - Joint Compound MIN - Mineral GLASS - Fiberglass <1** - Trace PLAS - Plaster Vermiculite - Vermiculite is reported as an asbestos-containing mineral in accordance with NYSDOH determinations and requirements. See NYSDOH guidance, available upon request.

* "Polarized-light microscopy (PLM) is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can be used to determine if this material can be considered to be non-asbestos containing."
** Please note: Due to interference from sample matrix components results reported via PLM method ELAP 198.1 as negative (ND) or less than 1% (Trace) may be inaccurate and reported as a False Negative. It is recommended that additional analytical techniques such as gravimetric reduction, TEM and others be used to reduce obscuring effects of some matrix components yielding more accurate results.

LaBella Lab Bulk Sample Asbestos Analytical Report

LBL JOB # 1,21923

Client Code:

CLIENT: Labella Associates

Project Number: 2233600

PROJECT LOCATION: 300 Gidney Ave., Newburgh, NY

Field ID	LBL ID	Method	Asbestos Type	%	Other Fibers	%	Matrix	%	Color/Description
22B	121923-50	P	ND		CELL	100	ND		TAN SEAM TAPE
23A	121923-51	P	ND		ND		MIN	100	WHITE JOINT COMPOUND
23B	121923-52	P	ND		ND		MIN	100	WHITE JOINT COMPOUND
24A	121923-53	G	ND		CELL	70	TAR	30	YELLOW FIBERGLASS BACKING PAPER
24B	121923-54	G	ND		CELL	70	TAR	30	YELLOW FIBERGLASS BACKING PAPER
24C	121923-55	G	ND		CELL	70	TAR	30	YELLOW FIBERGLASS BACKING PAPER

LAB DIRECTOR: Matthew Smith Date: 6/10/24

Method Code: P - Friable PLM result N - NOB PLM result T - TEM result IN* - Inconclusive G - Gravametric Matrix Reduction where sample residue weight is less than 1% of original sample weight, TEM not required.
Terms: ND** - None Detected CELL - Cellulose JC - Joint Compound MIN - Mineral GLASS - Fiberglass <1** - Trace PLAS - Plaster
Vermiculite - Vermiculite is reported as an asbestos-containing mineral in accordance with NYSDOH determinations and requirements. See NYSDOH guidance, available upon request.

* "Polarized-light microscopy (PLM) is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can be used to determine if this material can be considered to be non-asbestos containing."
** Please note: Due to interference from sample matrix components results reported via PLM method ELAP 198.1 as negative (ND) or less than 1% (Trace) may be inaccurate and reported as a False Negative. It is recommended that additional analytical techniques such as gravimetric reduction, TEM and others be used to reduce obscuring effects of some matrix components yielding more accurate results.

LaBella
Powered by partnership

300 State St. Suite 201
Rochester, NY 14614
Ph. 585-454-6110
Labellapc.com

CHAIN OF CUSTODY

Please RUSH

Project #:	2233600	Project Address:	300 Gidney Ave, Newburgh NY 12550
Client:	Newburgh Enlarged CSD	Contact:	Cameron Heller
Date:	12/15/2023	Rates:	STD.
Labella Lab #:	121923	# of Samples:	

Lab ID #	Sample #	Type of Material	Sample Location
T 1	1A	Gray Muddled 12x12 Floor Tile	Room 116
T 2	1B		Room 111
G 3	2A	Black Mastic Associated with Gray Muddled 12x12	Room 116
G 4	2B		Room 111
P 5	3A	Gray Cove Base	Room 111
P 6	3B		Room 110
T 7	4A	Tan Adhesive Associated with Gray Cove Base	Room 111
T 8	4B		Room 110
T 9	5A	White with Pink 12x12	Room A14
T 10	5B		Room A14
G 11	6A	Black Mastic Associated with White and Pink 12x12	Room A14
G 12	6B		Room A14
P 13	7A	Tan Cove Base	Room A14
P 14	7B		Room A14
T 15	8A	Tan with Brown Comingled Cove Base Adhesive	Room A14
T 16	8B		Room A14
T 17	9A	Red UV Cover Adhesive	Room 116
T 18	9B		Room 110
T 19	10A	White 2x2 Pinhole and Fissure Ceiling Tile	Corridor C-Side
T 20	10B		Corridor A-Side
P 21	11A	White Block Paint	Room 110
P 22	11B		Room 113
P 23	11C		Room 114
P 24	12A	Yellow Block Paint	Room A14
P 25	12B		Room 109
P 26	12C		Room 109A

Positive Stop: ☑ Email Results To: cheller@labellapc.com

Sampled By: _____ Print Name: Cameron Heller Date: _____

Relinquished By: _____ Print Name: Cameron Heller Date: 12/15/23

Received By: _____ Print Name: _____ Date: 12/18/23

LaBella
Powered by partnership.

300 State St. Suite 201
Rochester, NY 14614
Ph. 585-454-6110
Labellapc.com

CHAIN OF CUSTODY

PLEASE RUSH

Project #:	2233600	Project Address:	300 Gidney Ave, Newburgh NY
Client:	Newburgh Enlarged CSD	Contact:	Cameron Heller
Date:	06/06/2024	Rates:	STD.
Labella Lab #:	121923	# of Samples:	

MS

Lab ID #	Sample #	Type of Material	Sample Location
T 43	~~13A~~ 19A	White Pinhole Ceiling Tile	Gymnasium Classroom
T 44	~~13B~~ 19B		Gymnasium Classroom
P 45	~~14A~~ 20A	White Gypsum Ceiling Board	Gymnasium Classroom
P 46	~~14B~~ 20B		Gymnasium Classroom
P 47	~~15A~~ 21A	Gray Gypsum Wall Board	Gymnasium Classroom
P 48	~~15B~~ 21B		Gymnasium Classroom
P 49	~~16A~~ 22A	Tan Seam Tape	Gymnasium Classroom
P 50	~~16B~~ 22B		Gymnasium Classroom
P 51	~~17A~~ 23A	White Joint Compound	Gymnasium Classroom
P 52	~~17B~~ 23B		Gymnasium Classroom
GP 53	~~18A~~ 24A	Yellow Fiberglass Backing	Gymnasium Classroom
GP 54	~~18B~~ 24B		Gymnasium Classroom
GP 55	~~18C~~ 24C		Gymnasium Classroom

MS MS

Positive Stop: ✔ Email Results To: cheller@labellapc.com, dmonroe@labellapc.com

Sampled By:		Print Name:	Donald Monroe	Date:	6-6-24
Relinquished By:		Print Name:	Donald Monroe	Date:	6-6-24
Received By:	Matt Smith	Print Name:	Matt Smith	Date:	6/10/24

APPENDIX E:

LICENSES AND CERTIFICATIONS

WE ARE YOUR DOL

NEW YORK STATE | Department of Labor

DIVISION OF SAFETY & HEALTH LICENSE AND CERTIFICATE UNIT, STATE OFFICE CAMPUS, BLDG. 12, ALBANY, NY 12226

ASBESTOS HANDLING LICENSE

LaBella Associates, D.P.C.
300 State Street, Suite 201, Rochester, NY, 14614

License Number: 29278
License Class: RESTRICTED
Date of Issue: 03/24/2023
Expiration Date: 03/31/2024
Duly Authorized Representative: Greg Senecal

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

WE ARE YOUR DOL

NEW YORK STATE | Department of Labor

DIVISION OF SAFETY & HEALTH LICENSE AND CERTIFICATE UNIT, STATE OFFICE CAMPUS, BLDG. 12, ALBANY, NY 12226

ASBESTOS HANDLING LICENSE

LaBella Associates, D.P.C.
300 State Street, Suite 201, Rochester, NY, 14614

License Number: 29278
License Class: RESTRICTED
Date of Issue: 03/25/2024
Expiration Date: 03/31/2025
Duly Authorized Representative: Greg Senecal

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

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2024
Issued April 01, 2022
Revised March 30, 2023

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

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

MR. MATTHEW SMITH
LABELLA ASSOCIATES
300 STATE STREET SUITE 200
ROCHESTER, NY 14614

NY Lab Id No: 11184

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
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)

Serial No.: 66308

Property of the New York State Department of Health. Certificates are valid only at the address shown and must be conspicuously posted by the laboratory. Continued accreditation depends on the laboratory's successful ongoing participation in the Program. Consumers may verify a laboratory's accreditation status online at https://apps.health.ny.gov/pubdoh/applinks/wc/elappublicweb/, by phone (518) 485-5570 or by email to elap@health.ny.gov.

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2024
Issued April 01, 2022
Revised March 30, 2023

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

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

MICHAEL GREENBERG
AMA ANALYTICAL SERVICES INC
4475 FORBES BLVD
LANHAM, MD 20706

NY Lab Id No: 10920

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:

Metals I

Lead, Total	EPA 7000B

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
Lead in Dust Wipes	EPA 7000B
Lead in Paint	EPA 7000B

Sample Preparation Methods

	ASTM E-1979-17

Serial No.: 66247

Property of the New York State Department of Health. Certificates are valid only at the address shown and must be conspicuously posted by the laboratory. Continued accreditation depends on the laboratory's successful ongoing participation in the Program. Consumers may verify a laboratory's accreditation status online at https://apps.health.ny.gov/pubdoh/applinks/wc/elappublicweb/, by phone (518) 485-5570 or by email to elap@health.ny.gov.

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2025
Issued April 01, 2024

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

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

MR. MATTHEW SMITH
LABELLA ASSOCIATES
300 STATE STREET SUITE 200
ROCHESTER, NY 14614

NY Lab Id No: 11184

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
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)

Serial No.: 68695

Property of the New York State Department of Health. Certificates are valid only at the address shown and must be conspicuously posted by the laboratory. Continued accreditation depends on the laboratory's successful ongoing participation in the Program. Consumers may verify a laboratory's accreditation status online at https://apps.health.ny.gov/pubdoh/applinks/wc/elappublicweb/, by phone (518) 485-5570 or by email to elap@health.ny.gov.

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2024
Issued April 01, 2022
Revised March 30, 2023

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

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

MICHAEL GREENBERG
AMA ANALYTICAL SERVICES INC
4475 FORBES BLVD
LANHAM, MD 20706

NY Lab Id No: 10920

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:

Metals I

Lead, Total	EPA 7000B

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
Lead in Dust Wipes	EPA 7000B
Lead in Paint	EPA 7000B

Sample Preparation Methods

	ASTM E-1979-17

Serial No.: 66247

Property of the New York State Department of Health. Certificates are valid only at the address shown and must be conspicuously posted by the laboratory. Continued accreditation depends on the laboratory's successful ongoing participation in the Program. Consumers may verify a laboratory's accreditation status online at https://apps.health.ny.gov/pubdoh/applinks/wc/elappublicweb/, by phone (518) 485-5570 or by email to elap@health.ny.gov.

United States Environmental Protection Agency

This is to certify that

LaBella Associates, D.P.C.

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

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 26, 2024

LBP-2226-2

Certification #

August 24, 2021

Issued On

Michelle Price, Chief

Lead, Heavy Metals, and Inorganics Branch

United States Environmental Protection Agency

This is to certify that



Cameron M Heller

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

Risk Assessor

In the Jurisdiction of:

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

This certification is valid from the date of issuance and expires December 02, 2023

LBP-R-I175673-2

Certification #

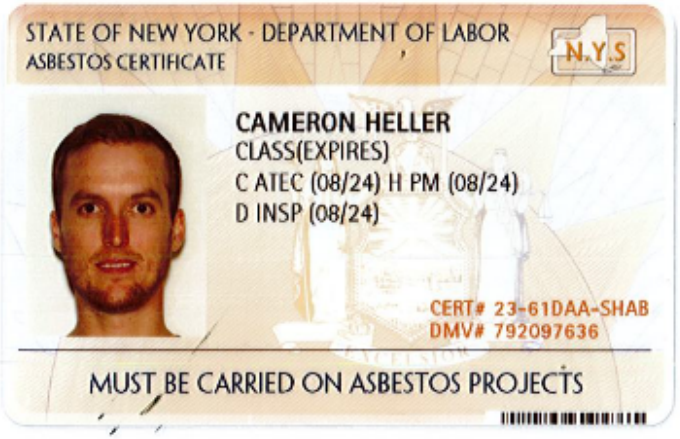
September 21, 2020

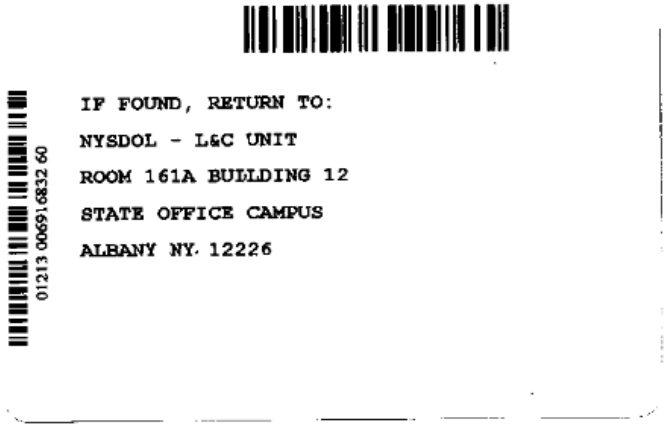
Issued On

Ben Conetta, Chief

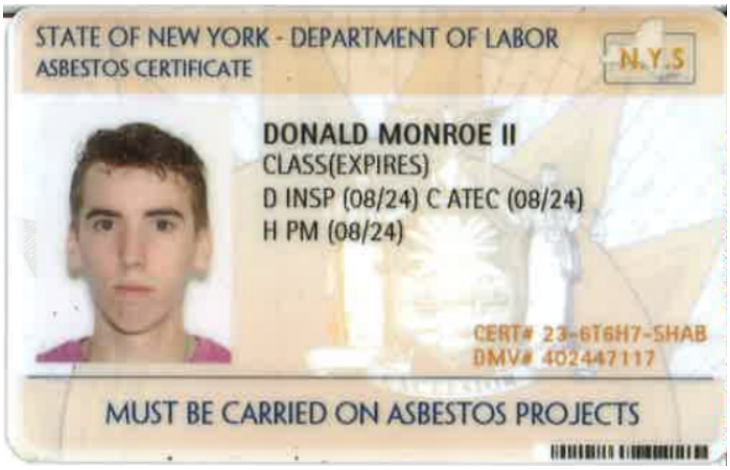
Chemicals and Multimedia Programs Branch

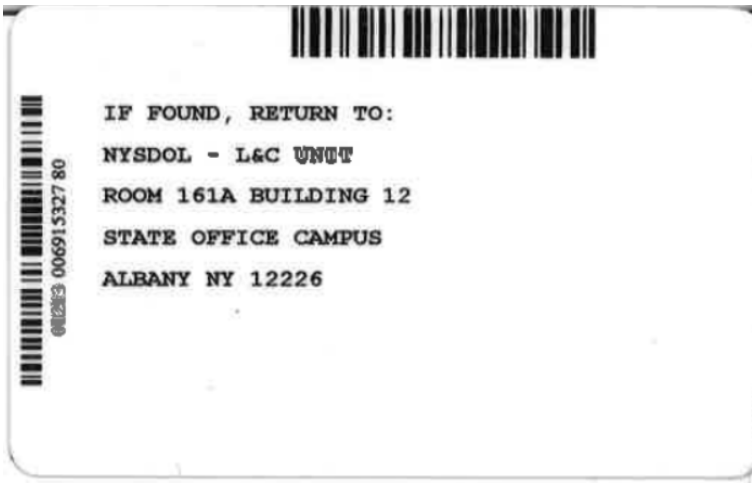
LaBella
Powered by partnership.





5 McCrea Hill Road | Ballston Spa, NY 12020 | p (518) 885-5383 | f (518) 885-5385
www.labellapc.com


STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE
N.Y.S
DONALD MONROE II
CLASS(EXPIRES)
D INSP (08/24) C ATEC (08/24)
H PM (08/24)
CERT# 23-6T6H7-SHAB
DMV# 402447117
MUST BE CARRIED ON ASBESTOS PROJECTS


IF FOUND, RETURN TO:
NYSDOL - L&C UNIT
ROOM 161A BUILDING 12
STATE OFFICE CAMPUS
ALBANY NY 12226

SECTION 004000 - IRAN DIVESTMENT ACT CERTIFICATION

As a result of the Iran Divestment Act of 2012 (Act), Chapter 1 of the 2012 Laws of New York, a new provision has been added to the State Finance Law (SFL), § 165-a, effective April 12, 2012. Under the Act, the Commissioner of the Office of General Services (OGS) will be developing a list (prohibited entities list) of "persons" who are engaged in "investment activities in Iran" (both are defined terms in the law). 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, Bidder/Contractor (or any assignee) certifies that once the prohibited entities list is posted on the OGS website, it will not utilize on such Contract any subcontractor that is identified on the prohibited entities list.

Additionally, Bidder/Contractor is advised that once the list is posted on the OGS website, any Contractor seeking to renew or extend a Contract or assume the responsibility of a Contract awarded in response to the 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 New York State Education Department (AGENCY) receive information that a person is in violation of the above-referenced certification, AGENCY will offer the person an opportunity to respond. If the person fails to demonstrate that it has ceased its engagement in the investment which is in violation of the Act within 90 days after the determination of such violation, then AGENCY shall take such action as may be appropriate including, but not limited to, imposing sanctions, seeking compliance, recovering damages, or declaring the Contractor in default.

AGENCY reserves the right to reject any bid or request for assignment for an entity that appears on the prohibited entities list prior to the award of a contract, and to pursue a responsibility review with respect to any entity that is awarded a contract and appears on the prohibited entities list after contract award.

Signature:_____

Print Name:_____

Title:_____

Company Name:_____

Date: :_____

Note: Include section with Bid Form

END OF SECTION

SECTION 004110.01 - BID FORM CONTRACT MC-01 – Mechanical Contractor (MC-01)

Newburgh Enlarged City School District-2019 Capital Project

BIDDER INFORMATION

CONTACT: _____

COMPANY: _____

ADDRESS: _____

_____

TELEPHONE: (_____) _____

FACSIMILE: (_____) _____

BID TO (Owner): Attention: Purchasing Agent
Newburgh Enlarged City School District
124 Grand Street
Newburgh, New York 12550

PRIME CONTRACT: Contract No. 01 – Mechanical Contractor (MC-01)

PROJECT TITLE: Newburgh Enlarged City School District
2019 Capital Project

SED Project Control No.	*Gidney Avenue Elementary School*	*SED# 44-16-00-01-0-006-015*
	Temple Hill Academy	*SED# 44-16-00-01-0-036-015*
	Meadow Hill GEM School	*SED# 44-16-00-01-0-035-014*

Labella PROJECT NO: 2233600

1. **Representations**: By making this Bid, the Bidder represents that:

   The Bidder (identified above) hereby certifies that they have examined and fully understands the requirements and intent of the Bidding and Contract Documents, including Drawings, Project Manuals, and Addenda; and proposes to provide all labor, material, and equipment necessary to complete the Work on, or before, the dates specified in the Agreement for the Base Bid of:

2. **Total Base Bid**:_____($_____)

   Gidney Avenue Elementary School:_____($_____)
   Temple Hill Academy:_____($_____)
   Meadow Hill GEM School:_____($_____)
   (Words) (Figures)

   In all locations sums shall be expressed in both words and figures. In case of discrepancy, written word governs.

3. **Addenda**: The Bidder acknowledges receipt of the following Addendum:

   No. _____ Dated_____ No. _____ Dated_____
   No. _____ Dated_____ No. _____ Dated_____
   No. _____ Dated_____ No. _____ Dated_____

4. **Alternates**:
   A. Add Alternate 01- Corridor Air Conditioning System at Gidney Avenue Elementary School.
   _____($_____)
   B. Add Alternate 02- Corridor Air Conditioning System at Meadow Hill GEM School.
   _____($_____)
   C. Add Alternate 03- Corridor Air Conditioning System at Temple Hill Academy.
   _____($_____)
   D. Deduct Alternate 01- Control work at Gidney Avenue Elementary School.
   _____($_____)
   E. Deduct Alternate 02- Control work at Meadow Hill GEM School.
   _____($_____)
   F. Deduct Alternate 03- Control work at Temple Hill Academy.
   _____($_____)

5. **Bid Security:** Attached hereto is Bid Security in the form of (circle correct form) Bid Bond, Certified Check, Cash in the amount of 5 percent (5%) of the written Base Bid amount.

6. **Allowances:**
   A. $100,000 Allowance for unforeseen conditions for Mechanical Work at Gidney Avenue Elementary School.
   B. $250,000 Allowance for unforeseen conditions for Mechanical Work at Temple Hill Academy.
   C. $250,000 Allowance for unforeseen conditions for Mechanical Work at Meadow Hill GEM School.

7. **Time of Commencement and Completion**: The Bidder agrees to commence Work on the

stipulated starting date(s) and will substantially complete the Work in accordance with the project schedule stipulated in Specification Section 011200 Multiple Contract Summary and Section 003113 Preliminary Schedules.

8. **Rejection of Bids**: The Bidder acknowledges that the Owner reserves the right to waive any informality in, or to reject any or all Bids.

9. **Execution of Contract**: If notice of the acceptance of this Bid is mailed, telegraphed, or otherwise delivered to the undersigned within forty-five (45) days after the date of the Bid Opening, or any time thereafter, the undersigned will, within five (5) working days after the receipt of the form of Agreement, execute and deliver the Contract.

10. **Signature**:

_____
(Signature)

_____
(Name – Printed)

_____
(Title – Printed) (Date)

11. **Attachments**: Obtain and attach the following documents to each individual Bid.

A. 004116 Bid Form- all costs are to be filled out.
B. 004313 Bid Bond- A310.
C. 004325 Substitution list.
D. 004336 Proposed Subcontractor Form.
E. 004513 Contractor's Qualification Statement – AIA Document 305, 2020 edition.
F. 004519 Non-Collusive Bid Certification.
G. 004520 Iran Divestment Act Certification.
H. 004521 Understanding of Agreement
I. 004522 Proposer Warranties.
J. 004523 Sexual Harassment Certifications.
K. 004543 Corporate Resolution.
L. 004544 Insurance Affidavit.
M. 012200 Unit prices.
N. 012300 Alternates.

12. **Work Cost Breakdown:** This form shall be filled out and submitted by the Contractor. The

grand total must equal the BASE BID under Section I (A) "THE BID". UNIT PRICES are required for the items listed in the Unit Prices section of the work cost breakdown. Unit prices will be provided for use if the required quantities are more or less than the quantities indicated in the plans and specifications. Failure to complete the work cost breakdown may result in the disqualification of the bid. As itemized in the "Instructions to Bidders" for a complete Bid Form include the following which must be filled out completely, failure to comply with any listed below bid will be a rejected bid:

a. Bid Form, all costs must be shown in each CSI section and totaled, failure to breakdown these costs will be subject to disqualification of bid.

b. Unit costs

Gidney Avenue Elementary School Bid Cost

Mechanical Contractor 01 (MC-01)

Contract Number: Newburgh Enlarged City School District

Contract Titles: Newburgh Enlarged City School District
2019 Capital Bond

Bidder: Date:

* Refer to Section 012973 Schedule of Values for additional information

Item	Division	Description	QTY	Unit	Total
1	1	General Requirements (Submittals, Punchlist, etc.)			
2	1	012100 Allowances - Unforeseen Conditions	1	N/A	$100,000
3	2	024119 Selective Demolition			
4	7	078413 Penetration Firestopping			
5	23	230513 Common Motor Requirements			
6	23	230517 Sleeves and Sleeve Seals for HVAC Piping			
7	23	230518 Escutcheons for HVAC Piping			
8	23	230519 Meters and Gages for HVAC Piping			
9	23	230523 General-Duty Valves for HVAC Piping			
10	23	230529 Hangers and Supports for HVAC Piping and Equipment			
11	23	230548 Vibration and Seismic Controls HVAC			
12	23	230553 Identification for HVAC Piping and Equipment			
13	23	230593 Testing, Adjusting, and Balancing For HVAC			
14	23	230700 HVAC Insulation			
15	23	230800 Retro-Commissioning and Commissioning of HVAC			
16	23	230900 Instrumentation and Control for HVAC			
17	23	230924 Control Valves			
18	23	232113 Hydronic Piping and Specialties			
19	23	232123 Hydronic Pumps			
20	23	232300 Refrigerant Piping			
21	23	233113 Metal Ducts			
22	23	233300 Air Duct Accessories			
23	23	233713 Diffusers, Registers, and Grilles			
24	23	233723 Air Louvers			
25	23	233724 HVAC Gravity Ventilators			
26	23	234113 Panel Air Filters			

27	23	235700 Heat Exchangers for HVAC			
28	23	236200 Packaged Compressor and Condenser Units			
29	23	237343 Direct Replacement Multizone Air Handling Units			
30	23	238126 Split System Air-Conditioners			
31	23	238129 Variable-Refrigerant-Flow HVAC Systems			
32	23	238223 Unit Ventilators			
33	23	238236 Finned Tube Radiation			
34	23	238239 Cabinet Unit Heaters			

Gidney Avenue Elementary School Base Bid $_____

Temple Hill Academy Bid Cost

Mechanical Contractor 01 (MC-01)

Contract Number: Newburgh Enlarged City School District

Contract Titles: Newburgh Enlarged City School District
2019 Capital Bond

Bidder: Date:

* Refer to Section 012973 Schedule of Values for additional information

Item	Division	Description	QTY	Unit	Total
1	1	General Requirements (Submittals, Punchlist, etc.)			
2	1	015000 Temp Facilities			
3	1	012100 Allowances - Unforeseen Conditions	1	N/A	$250,000
4	2	024119 Selective Demolition			
5	7	078413 Penetration Firestopping			
6	23	230513 Common Motor Requirements			
7	23	230517 Sleeves and Sleeve Seals for HVAC Piping			
8	23	230518 Escutcheons for HVAC Piping			
9	23	230519 Meters and Gages for HVAC Piping			
10	23	230523 General-Duty Valves for HVAC Piping			
11	23	230529 Hangers and Supports for HVAC Piping and Equipment			
12	23	230548 Vibration and Seismic Controls HVAC			
13	23	230553 Identification for HVAC Piping and Equipment			
14	23	230593 Testing, Adjusting, and Balancing For HVAC			
15	23	230700 HVAC Insulation			
16	23	230800 Retro-Commissioning and Commissioning of HVAC			
17	23	230900 Instrumentation and Control for HVAC			
18	23	230924 Control Valves			
19	23	232113 Hydronic Piping and Specialties			
20	23	232123 Hydronic Pumps			
21	23	232300 Refrigerant Piping			
22	23	233113 Metal Ducts			
23	23	233300 Air Duct Accessories			

24	23	233713 Diffusers, Registers, and Grilles			
25	23	233723 Air Louvers			
26	23	233724 HVAC Gravity Ventilators			
27	23	234113 Panel Air Filters			
28	23	235700 Heat Exchangers for HVAC			
29	23	236200 Packaged Compressor and Condenser Units			
30	23	237343 Direct Replacement Multizone Air Handling Units			
31	23	238126 Split System Air-Conditioners			
32	23	238129 Variable-Refrigerant-Flow HVAC Systems			
33	23	238223 Unit Ventilators			
34	23	238236 Finned Tube Radiation			
35	23	238239 Cabinet Unit Heaters			

Temple Hill Academy Base Bid $_____

Meadow Hill GEM School Bid Cost

Mechanical Contractor 01 (MC-01)

Contract Number:	Newburgh Enlarged City School District
Contract Titles:	Newburgh Enlarged City School District 2019 Capital Bond
Bidder:	Date:

* Refer to Section 012973 Schedule of Values for additional information

Item	Division	Description	QTY	Unit	Total
1	1	General Requirements (Submittals, Punchlist, etc.)			
2	1	015000 Temp Facilities			
3	1	012100 Allowances - Unforeseen Conditions	1	N/A	$250,000
4	2	024119 Selective Demolition			
5	7	078413 Penetration Firestopping			
6	23	230513 Common Motor Requirements			
7	23	230517 Sleeves and Sleeve Seals for HVAC Piping			
8	23	230518 Escutcheons for HVAC Piping			
9	23	230519 Meters and Gages for HVAC Piping			
10	23	230523 General-Duty Valves for HVAC Piping			
11	23	230529 Hangers and Supports for HVAC Piping and Equipment			
12	23	230548 Vibration and Seismic Controls HVAC			
13	23	230553 Identification for HVAC Piping and Equipment			
14	23	230593 Testing, Adjusting, and Balancing For HVAC			
15	23	230700 HVAC Insulation			
16	23	230800 Retro-Commissioning and Commissioning of HVAC			
17	23	230900 Instrumentation and Control for HVAC			
18	23	230924 Control Valves			
19	23	232113 Hydronic Piping and Specialties			
20	23	232123 Hydronic Pumps			
21	23	232300 Refrigerant Piping			
22	23	233113 Metal Ducts			
23	23	233300 Air Duct Accessories			

24	23	233713 Diffusers, Registers, and Grilles			
25	23	233723 Air Louvers			
26	23	233724 HVAC Gravity Ventilators			
27	23	234113 Panel Air Filters			
28	23	235700 Heat Exchangers for HVAC			
29	23	236200 Packaged Compressor and Condenser Units			
30	23	237343 Direct Replacement Multizone Air Handling Units			
31	23	238126 Split System Air-Conditioners			
32	23	238129 Variable-Refrigerant-Flow HVAC Systems			
33	23	238223 Unit Ventilators			
34	23	238236 Finned Tube Radiation			
35	23	238239 Cabinet Unit Heaters			

Meadow Hill GEM School Base Bid $_____

Unit Prices

Contract Number: Mechanical Contractor 01 (MC-01)
Newburgh Enlarged City School District

Contract Titles: Newburgh Enlarged City School District
2019 Capital Bond

Bidder: Date:

* Refer to Section 012200 Unit Prices for additional information

Unit Prices – Additional Fee Schedule – All prices are Furnish and Install

Item	Description	Unit	Unit Price- ADD
1	Heat Pump	EA	
2	Condensate Pump	EA	
3	Diffusers	EA	
4	Copper Piping	LF	
5	Thermostats	EA	
7	Ceiling Cassette	EA	
8	Duct Insulation	SF	
9	Registers	EA	
10	Cabinet Unit Heaters	EA	
11	Variable Refrigerant Flow HVAC System	EA	
12	Unit Ventilator	EA	
13	RA Grilles	EA	
	Ductwork-		
14	Metal	LBS	
15	Oval	LBS	

END OF SECTION 004116.05

SECTION 004116.02 - BID FORM CONTRACT EC-01 – Electrical Contractor (EC-01)

Newburgh Enlarged City School District-2019 Capital Project

BIDDER INFORMATION

CONTACT: _____

COMPANY: _____

ADDRESS: _____

_____

TELEPHONE: (_____) _____

FACSIMILE: (_____) _____

BID TO (Owner): Attention: Purchasing Agent
Newburgh Enlarged City School District
124 Grand Street
Newburgh, New York 12550

PRIME CONTRACT: Contract No. 02 – Electrical Contractor (EC-01)

PROJECT TITLE: Newburgh Enlarged City School District
2019 Capital Project

SED Project Control No.	*Gidney Ave Elementary School*	*SED# 44-16-00-01-0-006-015*
	Temple Hill Academy	*SED# 44-16-00-01-0-036-015*
	Meadow Hill GEM School	*SED# 44-16-00-01-0-035-014*

Labella PROJECT NO: 2233600

1. **Representations**: By making this Bid, the Bidder represents that:

   The Bidder (identified above) hereby certifies that they have examined and fully understands the requirements and intent of the Bidding and Contract Documents, including Drawings, Project Manuals, and Addenda; and proposes to provide all labor, material, and equipment necessary to complete the Work on, or before, the dates specified in the Agreement for the Base Bid of:

2. **Total Base Bid**:_____($_____)

   Gidney Ave Elementary School:_____($_____)
   Temple Hill Academy:_____($_____)
   Meadow Hill GEM School:_____($_____)
   (Words) (Figures)

   In all locations sums shall be expressed in both words and figures. In case of discrepancy, written word governs.

3. **Addenda**: The Bidder acknowledges receipt of the following Addendum:

   No. _____ Dated_____ No. _____ Dated_____
   No. _____ Dated_____ No. _____ Dated_____
   No. _____ Dated_____ No. _____ Dated_____

4. **Alternates**:
   Add Alternate 01- Add Power for Corridor Air Conditioning System at Gidney Ave Elementary School _____($_____)
   Add Alternate 02- Add Power for Corridor Air Conditioning System at Meadow Hill GEM School _____($_____)
   Add Alternate 03- Add Power for Corridor Air Conditioning System at Temple Hill Academy _____($_____)

5. **Bid Security:** Attached hereto is Bid Security in the form of (circle correct form) Bid Bond, Certified Check, Cash in the amount of 5 percent (5%) of the written Base Bid amount.

6. **Allowances:**
   A. $40,000.00 Allowance for unforeseen conditions for Electrical Work at Gidney Ave Elementary School.
   B. $80,000.00 Allowance for unforeseen conditions for Electrical Work at Temple Hill Academy
   C. $80,000.00 Allowance for unforeseen conditions for Electrical Work at Meadow Hill GEM School.

7. **Time of Commencement and Completion**: The Bidder agrees to commence Work on the stipulated starting date(s) and will substantially complete the Work in accordance with the project schedule stipulated in Specification Section 011200 Multiple Contract Summary and Section 003113 Preliminary Schedules.

8. **Rejection of Bids**: The Bidder acknowledges that the Owner reserves the right to waive any informality in, or to reject any or all Bids.

9. **Execution of Contract**: If notice of the acceptance of this Bid is mailed, telegraphed, or otherwise delivered to the undersigned within forty-five (45) days after the date of the Bid Opening, or any time thereafter, the undersigned will, within five (5) working days after the receipt of the form of Agreement, execute and deliver the Contract.

10. **Signature**:

_____
(Signature)

_____
(Name – Printed)

_____
(Title – Printed) (Date)

11. **Attachments**: Obtain and attach the following documents to each individual Bid.

A. 004116 Bid Form- all costs are to be filled out.
B. 004313 Bid Bond- A310.
C. 004325 Substitution list.
D. 004336 Proposed Subcontractors Form.
E. 004513 Contractor's Qualification Statement – AIA Document 305, 2020 edition.
F. 004519 Non-Collusive Bid Certification.
G. 004520 Iran Divestment Act Certification.
H. 004521 Understanding of Agreement
I. 004522 Proposer Warranties.
J. 004523 Sexual Harassment Certifications.
K. 004543 Corporate Resolution.
L. 004544 Insurance Affidavit.
M. 012200 Unit prices.
N. 012300 Alternates.

12. **Work Cost Breakdown:** This form shall be filled out and submitted by the Contractor. The grand total must equal the BASE BID under Section I (A) "THE BID". UNIT PRICES are required for the items listed in the Unit Prices section of the work cost breakdown. Unit prices will be provided for use if the required quantities are more or less than the quantities indicated in the plans and specifications. Failure to complete the work cost breakdown may result in the disqualification of the bid. As itemized in the "Instructions to Bidders" for a complete Bid Form include the following which must be filled out completely, failure to comply with any listed below bid will be a rejected bid:

a. Bid Form, all costs must be shown in each CSI section and totaled, failure to breakdown these costs will be subject to disqualification of bid.

b. Unit costs

Gidney Ave Elementary School

Contract Number:

Electrical Contractor 01 (EC-01)

Contract Titles:	Newburgh Enlarged City School District 2019 Capital Bond
Bidder:	Date:

* Refer to Section 012973 Schedule of Values for additional information

Item	Division	Description	QTY	Unit	Total
1	1	General Requirements (Submittals, Punchlist, etc.)			
2	1	012100 Allowances - Unforeseen Conditions	1	NA	$30,000
3	2	024100 Demolition			
4	7	078413 Penetration Firestopping			
	23	Mechanical Circuits and Wiring			
5	26	260500 General Electrical Requirements			
6	26	260519 Low-Voltage Electrical Power Conductors and Cables			
7	26	260526 Grounding and Bonding for Electrical Systems			
8	26	260529 Hangers and Supports for Electrical Systems			
9	26	260533 Raceways and Boxes for Electrical Systems			
10	26	260544 Sleeves and Sleeve Seals for Electrical Raceways and Cabling (Not Currently in Spec Section)			
11	26	260553 Identification for Electrical Systems			
12	26	262416 Panelboards			
13	26	262726 Wiring Devices			
14	26	262816 Fuses			
15	26	262816 Enclosed Switched and Circuit Breakers			
16	26	Remove and Reinstall Existing Lighting System			

Gidney Ave Elementary School Base Bid $_____

Temple Hill Academy
Bid Cost

Contract Number: Electrical Contractor 01 (EC-01)

Contract Titles: Newburgh Enlarged City School District
2019 Capital Bond

Bidder: Date:

* Refer to Section 012973 Schedule of Values for additional information

Item	Division	Description	QTY	Unit	Total
1	1	General Requirements (Submittals, Punchlist, etc.)			
2	1	015000 Temp Facilities			
3	1	012100 Allowances - Unforeseen Conditions	1	NA	$40,000
4	2	024100 Demolition			
5	7	078413 Penetration Firestopping			
6	23	Mechanical Circuits and Wiring			
7	26	260500 General Electrical Requirements			
8	26	260519 Low-Voltage Electrical Power Conductors and Cables			
9	26	260526 Grounding and Bonding for Electrical Systems			
10	26	260529 Hangers and Supports for Electrical Systems			
11	26	260533 Raceways and Boxes for Electrical Systems			
12	26	260544 Sleeves and Sleeve Seals for Electrical Raceways and Cabling			
13	26	260553 Identification for Electrical Systems			
14	26	262416 Panelboards			
15	26	262726 Wiring Devices			
16	26	262816 Fuses			
17	26	262816 Enclosed Switched and Circuit Breakers			
18	26	Remove and Reinstall Existing Lighting System			

Temple Hill Academy Base Bid $_____

Meadow Hill GEM
School Bid Cost

Contract Number: Electrical Contractor 01 (EC-01)

Contract Titles: Newburgh Enlarged City School District
2019 Capital Bond

Bidder: Date:

* Refer to Section 012973 Schedule of Values for additional information

Item	Division	Description	QTY	Unit	Total
1	1	General Requirements (Submittals, Punchlist, etc.)			
2	1	015000 Temp Facilities			
3	1	012100 Allowances - Unforeseen Conditions	1	NA	$40,000
4	2	024100 Demolition			
5	7	078413 Penetration Firestopping			
6	23	Mechanical Circuits and Wiring			
7	26	260500 General Electrical Requirements			
8	26	260519 Low-Voltage Electrical Power Conductors and Cables			
9	26	260526 Grounding and Bonding for Electrical Systems			
10	26	260529 Hangers and Supports for Electrical Systems			
11	26	260533 Raceways and Boxes for Electrical Systems			
12	26	260544 Sleeves and Sleeve Seals for Electrical Raceways and Cabling			
13	26	260553 Identification for Electrical Systems			
14	26	262416 Panelboards			
15	26	262726 Wiring Devices			
16	26	262816 Fuses			
17	26	262816 Enclosed Switched and Circuit Breakers			
18	26	Remove and Reinstall Existing Lighting System			

Meadow Hill GEM School Base Bid $_____

Unit Prices

Contract Number: Electrical Contractor 01 (EC-01)
Newburgh Enlarged City School District

Contract Titles: Newburgh Enlarged City School District
2019 Capital Bond

Bidder: Date:

* Refer to Section 012200 Unit Prices for additional information

Unit Prices – Additional Fee Schedule – All prices are Furnish and Install complete system

Item	Description	Unit	Unit Price - ADD
	Demo of Light Fixture	EA	
	Reinstallation of Light Fixture	EA	
	¾'' Conduit	LF	
	1-1/2" Conduit	LF	
	Fire Alarm Strobe	EA	
	1 pull breaker	EA	
	2 pull breakers	EA	
	Conductors	LF	
	Generator (Including Fuel & Other Operating Costs)	Day	
	Generator (Including Fuel & Other Operating Costs)	Wk	
	Receptacles		
	Quad	EA	
	Wall Duplex	EA	

SECTION 004116.03 - BID FORM CONTRACT GC-01 – General Contractor (GC-01)

Newburgh Enlarged City School District-2019 Capital Project Phase 1 Prop 5

BIDDER INFORMATION

CONTACT: _____

COMPANY: _____

ADDRESS: _____

_____

TELEPHONE: (_____) _____

FACSIMILE: (_____) _____

BID TO (Owner): Attention: Purchasing Agent
Newburgh Enlarged City School District
124 Grand Street
Newburgh, New York 12550

PRIME CONTRACT: Contract No. 03 – General Contractor (GC-01)

PROJECT TITLE: Newburgh Enlarged City School District
2019 Capital Project

SED Project Control No.	*Gidney Avenue Elementary School*	*SED# 44-16-00-01-0-006-015*
	Temple Hill Academy	*SED# 44-16-00-01-0-036-015*
	Meadow Hill GEM School	*SED# 44-16-00-01-0-035-014*

LaBella PROJECT NO: 2233600

1. **Representations**: By making this Bid, the Bidder represents that:

   The Bidder (identified above) hereby certifies that they have examined and fully understands the requirements and intent of the Bidding and Contract Documents, including Drawings, Project Manuals, and Addenda; and proposes to provide all labor, material, and equipment necessary to complete the Work on, or before, the dates specified in the Agreement for the Base Bid of:

2. **Total Base Bid**:_____($_____)

   Gidney Avenue Elementary School:_____($_____)
   Temple Hill Academy:_____($_____)
   Meadow Hill GEM School:_____($_____)
   (Words) (Figures)

   In all locations sums shall be expressed in both words and figures. In case of discrepancy, written word governs.

3. **Addenda**: The Bidder acknowledges receipt of the following Addendum:

   No. _____ Dated_____ No. _____ Dated_____
   No. _____ Dated_____ No. _____ Dated_____
   No. _____ Dated_____ No. _____ Dated_____

4. **Alternates**:
   A. Alternate - 01 Precast Concrete Mechanical Equipment Pads for Meadow Hill GEM School:
   _____($_____)
   B. Alternate - 02 Precast Concrete Mechanical Equipment Pads for Temple Hill Academy:
   _____($_____)
   C. Add Alternate- 01 Painting Gym Deck, Joists, Existing and New Ductwork at Meadow Hill GEM School:
   _____($_____)
   D. Add Alternate- 02 Painting Gym Deck, Joists, Existing and New Ductwork at Temple Hill Academy:
   _____($_____)
   E. Deduct Alternate- 01 Asbestos Abatement Work at Meadow Hill GEM School:
   _____($_____)
   F. Deduct Alternate- 02 Asbestos Abatement Work at Temple Hill Academy:
   _____($_____)

5. **Bid Security:** Attached hereto is Bid Security in the form of (circle correct form) Bid Bond, Certified Check, Cash in the amount of 5 percent (5%) of the written Base Bid amount.

6. **Allowances:**
   A. $100,000.00 Allowance for unforeseen conditions for General Work at Gidney Avenue Elementary School.

B. $300,000.00 Allowance for unforeseen conditions for General Work at Temple Hill Academy.
C. $300,000.00 Allowance for unforeseen conditions for General Work at Meadow Hill GEM School.

7. **Time of Commencement and Completion**: The Bidder agrees to commence Work on the stipulated starting date(s) and will substantially complete the Work in accordance with the project schedule stipulated in Specification Section 011200 Multiple Contract Summary and Section 003113 Preliminary Schedules.

8. **Rejection of Bids**: The Bidder acknowledges that the Owner reserves the right to waive any informality in, or to reject any or all Bids.

9. **Execution of Contract**: If notice of the acceptance of this Bid is mailed, telegraphed, or otherwise delivered to the undersigned within forty-five (45) days after the date of the Bid Opening, or any time thereafter, the undersigned will, within five (5) working days after the receipt of the form of Agreement, execute and deliver the Contract.

10. **Signature**:

_____
(Signature)

_____
(Name – Printed)

_____
(Title – Printed) (Date)

11. **Attachments**: Obtain and attach the following documents to each individual Bid.

A. 004116 Bid Form- all costs are to be filled out.
B. 004313 Bid Bond- A310.
C. 004325 Substitution list.
D. 004336 Proposed Subcontractors Form.
E. 004513 Contractor's Qualification Statement – AIA Document 305, 2020 edition.
F. 004519 Non-Collusive Bid Certification.
G. 004520 Iran Divestment Act Certification.
H. 004521 Understanding of Agreement.
I. 004522 Proposer Warranties.

J. 004523 Sexual Harassment Certifications.
K. 004543 Corporate Resolution.
L. 004544 Insurance Affidavit.
M. 012200 Unit prices.
N. 012300 Alternates.

12. **Work Cost Breakdown:** This form shall be filled out and submitted by the Contractor. The grand total must equal the BASE BID under Section I (A) "THE BID". UNIT PRICES are required for the items listed in the Unit Prices section of the work cost breakdown. Unit prices will be provided for use if the required quantities are more or less than the quantities indicated in the plans and specifications. Failure to complete the work cost breakdown may result in the disqualification of the bid. As itemized in the "Instructions to Bidders" for a complete Bid Form include the following which must be filled out completely, failure to comply with any listed below bid will be a rejected bid:
    a. Bid Form, all costs must be shown in each CSI section and totaled, failure to breakdown these costs will be subject to disqualification of bid.
    b. Unit costs

Gidney Avenue Elementary School Bid Cost

Contract Number:	General Contractor 01 (GC-01) Newburgh Enlarged City School District
Contract Titles:	Newburgh Enlarged City School District 2019 Capital Bond Phase 1 Prop 5

Bidder: Date:

* Refer to Spec Section 012973 Schedule of Values for additional information

Item	Division	Description	QTY	Unit	Total
1	1	General Requirements (Submittals, Punchlist, etc.)			
2	1	012600 Allowances - Unforeseen Conditions	1	N/A	$100,000
3	2	024100 Demolition			
4	3	033000 Cast-In-Place Concrete			
5	4	040120 Brick Masonry Repair			
6	4	042000 Unit Masonry			
7	5	055000 Metal Fabrications			
8	6	061053 Miscellaneous Rough Carpentry			
9	7	071416 Moisture and Waterproofing			
10	7	075323 Roofing			
11	7	078413 Penetration Firestopping			
12	7	079200 Joint Sealants			
13	8	081000 Doors, Frames, Hardware			
14	8	083113 Security Access Doors			
15	9	092216 Non-Structural Metal Framing			
16	9	092900 Gypsum Board			
17	9	095113 Acoustic Panel Ceilings			
18	9	099100 Painting			
19	31	312000 Earth Moving- Excavation/backfill			
20	31	312319 Dewatering			
21	31	312500 Erosion and Sediment Control			
22	32	329200 Topsoil and Seeding			
23	32	323123 Vinyl Fencing and Gates			

Gidney Avenue Elementary School Base Bid $_____

Temple Hill Academy Base Bid

Contract Number:	General Contractor 01 (GC-01) Newburgh Enlarged City School District
Contract Titles:	Newburgh Enlarged City School District 2019 Capital Bond Phase 1 Prop 5
Bidder:	Date:

* Refer to Spec Section 012973 Schedule of Values for additional information

Item	Division	Description	QTY	Unit	Total
1	1	General Requirements (Submittals, Punchlist, etc.)			
2	1	012600 Allowances - Unforeseen Conditions	1	N/A	$300,000
3	2	020800 Abatement			
4	2	024100 Demolition			
5	3	033000 Cast-In-Place Concrete			
6	4	040120 Brick Masonry Repair			
7	4	042000 Unit Masonry			
8	5	055000 Metal Fabrications			
9	6	061053 Miscellaneous Rough Carpentry			
10	7	071416 Moisture and Waterproofing			
11	7	075323 Roofing			
12	7	078413 Penetration Firestopping			
13	7	079200 Joint Sealants			
14	8	08000 Doors, Frames, Hardware			
15	8	083113 Security Access Doors			
16	8	088000 Glazing			
17	9	092216 Non-Structural Metal Framing			
18	9	092900 Gypsum Board			
19	9	095113 Acoustic Panel Ceilings			
20	9	099100 Painting			
21	31	312000 Earth Moving- Excavation/backfill			
22	31	312319 Dewatering			
23	31	312500 Erosion and Sediment Control			
24	32	329200 Topsoil and Seeding			
25	32	323123 Vinyl Fencing and Gates			
		Concrete Vault and Loading Dock Repair Work			
		General Section			
26	2	024100 Demolition			

27	3	033000 Concrete			
28	4	042000 Masonry			
29	5	055200 Metal Railings			
30	7	071000 Waterproofing			
31	9	099100 Painting			

Temple Hill Academy Base Bid $_____

Meadow Hill GEM School Base Bid

Contract Number:	General Contractor 01 (GC-01) Newburgh Enlarged City School District
Contract Titles:	Newburgh Enlarged City School District 2019 Capital Bond Phase 1 Prop 5
Bidder:	Date:

* Refer to Spec Section 012973 Schedule of Values for additional information

Item	Division	Description	QTY	Unit	Total
1	1	General Requirements (Submittals, Punchlist, etc.)			
2	1	012600 Allowances - Unforeseen Conditions	1	N/A	$300,000
3	2	020800 Abatement			
4	2	024100 Demolition			
5	3	033000 Cast-In-Place Concrete			
6	4	040120 Brick Masonry Repair			
7	4	042000 Unit Masonry			
8	5	055000 Metal Fabrications			
9	6	061053 Miscellaneous Rough Carpentry			
10	7	071416 Moisture and Waterproofing			
11	7	075323 Roofing			
12	7	078413 Penetration Firestopping			
13	7	079200 Joint Sealants			
14	8	08000 Doors, Frames, Hardware			
15	8	083113 Security Access Doors			
16	8	088000 Glazing			
17	9	092216 Non-Structural Metal Framing			
18	9	092900 Gypsum Board			
19	9	095113 Acoustic Panel Ceilings			
20	9	099100 Painting			
21	31	312000 Earth Moving- Excavation/backfill			
22	31	312319 Dewatering			
23	31	312500 Erosion and Sediment Control			
24	32	329200 Topsoil and Seeding			
25	32	323123 Vinyl Fencing and Gates			
		Concrete Vault and Loading Dock Repair Work			
		General Section			
26	2	024100 Demolition			

27	3	033000 Concrete			
28	4	042000 Masonry			
29	5	055200 Metal Railings			
30	7	071000 Waterproofing			
31	9	099100 Painting			

Meadow Hill GEM School Base Bid $_____

Contract Number: General Contractor 01 (GC-01) Newburgh Enlarged City School District

Contract Titles: Newburgh Enlarged City School District 2019 Capital Bond

Bidder: Date:

* Refer to Section 012200 Unit Prices for additional information

Unit Prices – Additional Fee Schedule – All prices are Furnish and Install

Item	Description	Unit	Unit Price- ADD
1	Painting	SF	
2	Fire Rated Sheetrock Repair	SF	
3	Ceiling Tile	EA	
4	Fencing Cost	LF	
5	Concrete Cost	CY	
6	Brick Repair	SF	

END OF SECTION 004116.05

SECTION 004200 - SUPPLEMENTS TO BID FORM

The following attachments to these Supplements to Bid Form must be completed and submitted together with the Bid Form:

1. 00 41 16 Bid Form – All Costs are to be filled out.
2. 00 43 13 AIA Document A310 Bid Bond
3. 00 43 25 Substitution List
4. 00 43 36 Proposed Subcontractors Form
5. 00 45 13 AIA Document 305 – Contractor's Qualification Statement
6. 00 45 19 Non-Collusive Bid Certification
7. 00 45 20 Iran Divestment Act Certification
8. 00 45 21 Understanding of Agreement
9. 00 45 22 Proposer Warrantees
10. 00 45 23 Sexual Harassment Certifications
11. 004543 Corporate Resolution
12. 004544 Insurance Affidavit
13. 01 22 00 Unit Prices
14. 01 23 00 Alternates

The requirements of this Section shall not limit or abrogate the Contractor's responsibility to provide all other required forms and information as specified in the Contract Documents at the time of bidding.

END OF SECTION 004200

DRAFT **AIA® Document A310™ – 2010**

Bid Bond

CONTRACTOR:
(Name, legal status and address)

« »« »
« »

SURETY:
(Name, legal status and principal place of business)

« »« »
« »

OWNER:
(Name, legal status and address)

« »« »
« »

BOND AMOUNT: $ « »

PROJECT:
(Name, location or address, and Project number, if any)

« »
« »
« »

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, 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.

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

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

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

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User Notes: (2004437842)

Signed and sealed this « » day of « » , « »

	« »
	(Contractor as Principal) *(Seal)*
	« »
(Witness)	*(Title)*
	« »
	(Surety) *(Seal)*
	« »
(Witness)	*(Title)*

DRAFT

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User Notes: (2004437842)

SECTION 004321 - ALLOWANCE FORM

1.1 BID INFORMATION

A. Bidder: _____.

B. Project Name: District Wide A/C – Electrical Upgrades

C. Project Location: Newburgh, NY.

D. Owner: Newburgh Enlarged Central School District

E. Architect: LaBella Associates D.P.C.

F. Architect Project Number: 2233600

1.2 BID FORM SUPPLEMENT

A. This form is required to be attached to the Bid Form.

B. The undersigned Bidder certifies that Base Bid submission to which this Bid Supplement is attached includes those allowances described in the Contract Documents and scheduled in Section 012100 "Allowances."

1.3 SUBMISSION OF BID SUPPLEMENT

A. Respectfully submitted this ____ day of _____, 2024.

B. Submitted By:_____(Insert name of bidding firm or corporation).

C. Authorized Signature:_____(Handwritten signature).

D. Signed By:_____(Type or print name).

E. Title:_____(Owner/Partner/President/Vice President).

END OF DOCUMENT 004321

SECTION 004325 - SUBSTITUTION REQUEST FORM

Should any part or portion of the Work be planned for substitute products, list all substitutes that are proposed for products that have been specified by one or more manufacturers in the specifications. Please print in ink or type in the spaces provided. Attach additional sheets if necessary.

This identification of substitutions is required of Bidder(s) as part of the Supplementary Bid Forms and is in partial fulfillment of requirements of the Instructions to Bidders. Substitutions may affect Owner's acceptance of the Bid and decision to award Contract. Additional data on substitutions may be requested from selected Bidder(s) after the Bid Opening in accordance with Division 01 Section "Product Requirements."

CONTRACTOR NAME _____

CONTRACT NAME/# _____

SPECIFICATION SECTION	SPECIFIED ITEM	SUBSTITUTION

END OF SECTION 004325

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SECTION 004336 - PROPOSED SUBCONTRACTORS FORM

Should any part or portion of the Work be planned for subcontracting, list the name and address of all Subcontractors that Bidder(s) proposes to use on Prime Contract and the assigned Work to each. Please print in ink or type in the spaces provided. Attach additional sheets if necessary.

This identification of subcontractors is required of Bidder(s) as part of the Supplementary Bid Forms and is in partial fulfillment of requirements of the Instructions to Bidders. Additional data on proposed Subcontractors may be requested from selected Bidders after the Bid Opening in accordance with the Instructions to Bidders.

CONTRACTOR NAME _____

CONTRACT NAME/# _____

SUBCONTRACTOR	ADDRESS	ASSIGNED WORK

END OF SECTION 004336

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SECTION 004393 - BID SUBMITTAL CHECKLIST

This "Bid Submittal Checklist" is provided only as a general overview and shall not relieve bidders of their obligation to provide all information, forms and certifications required to be submitted with their bids as set forth more fully in the Contract Documents.

A. Bid Form completed (Section 004110) with Base Bid amount (*and allowances, if applicable*)
   1) Addenda acknowledged on Bid Form
   2) Certification of Non-Collusion in Bidding – on Bid Form

B. Supplementary Bid Information (004300):
   1) Form of Bid Bond, with completed acknowledgements
   2) Appendices A, B, C and, D signed and acknowledged:
      a) Offeror's Affirmation of Understanding and Agreement Pursuant to State Finance Law § 139-j(6)(b)
      b) Offeror Certification of Compliance with State Finance Law § 139-k(5)
      c) Offeror Disclosure of Prior Non-Responsibility Determination
      d) Iran Divestment Act Compliance Certification

C. Statement of Bidder's Qualifications (Section 004513) including:
   1) Certified financial statement
   2) Completed certification (including non-bankruptcy certification)
   3) List of prior projects and references, attached to Statement

END OF SECTION 004393

SECTION 004513 - STATEMENT OF BIDDER QUALIFICATIONS

Bidders may be judged qualified only for the type of work in which they demonstrate competence. Owner will make such investigation it feels necessary to determine the competency of the Bidder to perform the Work. The Bidder shall furnish promptly all information the Owner requests for Owner to investigate as it deems appropriate. Bidders must have, at minimum, successfully completed three (3) prior projects of similar size and scope to the Work of the Contract.

The Bidder bears the sole responsibility for any subcontractors it may employ for any part of the Work. Bidder is advised to utilize similar qualification standards against which it will be judged when using the services of any subcontractors or suppliers. Bidders must verify that any subcontractor or suppliers are in good standing and have not been previously debarred or found not to be qualified for performance of any Newburgh Enlarged City School District Contract.

1. *Name of Bidder:* _____

2. *Type of Business:* (e.g. corporation, partnership, etc.)

   : Date of formation:: _____
   Place of formation: _____

3. *How many years has the Bidder done business under its present name?* _____years

4. *List the names of the persons who are directors, officers, owners, managerial employees or partners in the Bidder's business:*

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

5. *Have any of the persons in No. 4 owned, operated, or been shareholders in any other companies?*

   Yes No

If Yes, list the names of said persons and the names of their previous affiliations:

Names	Names
_____	_____
_____	_____
_____	_____

6. *Has any director, officer, owner or managerial employee had any professional license suspended or revoked?*

   Yes No

If Yes, please indicate their names, license previously held, whether it was revoked or suspended and the date:

Name	License Held	Revoked	Suspended	Date

7. *Please list in reverse chronological order all projects completed in the past five years involving work of a similar nature to this Contract, including a minimum of three projects. For each, provide the project name, date, location, dollar amount, brief description, and references with names and telephone numbers, and the name(s) of the architect/engineer.* ***Attach additional sheets as needed.***

   Project: Location/Owner: Date: Price: Description:

   _____
   _____
   _____

8. *During the five-year period preceding the submission of this Bid, has the Bidder been found guilty of any OSHA violations?*

   Yes No

If Yes, please describe the nature of the OSHA violation(s) and indicate the remediation or other steps taken regarding such violations(s):

Violation	Remediation

9. *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 national origins and/or violations of an employee's civil rights or equal employment opportunities?*

   Yes No

If Yes, please list the names of persons making such claim, a description of the claim, the status of the claim and what disposition, if any, has been made regarding such claim:

Name	Claim	Status	Disposition

10. *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 of work related to any project in which it has been engaged?*

Yes No

Lawsuit	Index Number	Disposition

11. *During the five-year period preceding the submission of this Bid, has the Bidder been the subject of 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?*

Yes No

If Yes, please list each instance of the commencement of a Department of Labor proceeding, the project to which it related, and the status or resolution thereof through Bid submission:

Proceeding	Project	Disposition

12. *During the five-year period preceding the submission of this Bid, has the Bidder been the subject of proceedings involving allegation 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?*

Yes No

If Yes, please list each instance of the claimed violation and the status of the claim at the time of submission of this Bid:

Violation	Remediation

13. *During the five-year period preceding the submission of this Bid, has the Bidder been the subject of 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?*

Yes No

If Yes, please list each instance of the commencement of a Department of Labor proceeding, the project for which it was commenced, and the status of the proceeding at the time of submission of this Bid:

Proceeding	Project	Disposition

14. *During the five-year period preceding the submission of this Bid, have the Bidder, its officers, directors, owner, and/or managerial employees been the subject of a criminal indictment?*

Yes No

If Yes, please list the name of the person(s) indicted or convicted, the charge against the individual and the disposition of the charge:

Name	Charge	Disposition

15. *During the five-year period preceding the submission of this Bid, has the Bidder been charged with and/or found guilty of any violations of federal, state, municipal, environmental, and/or health laws, codes, rules and/or regulations?*

Yes *No*

If Yes, please list the charge against the Bidder, the date of the charge, and the status of the charge at the time of submission of this Bid:

16. *Has the Bidder submitted bids on any other projects or contracts aside from the instant Bid?*

Yes No

If Yes, please list the projects bid upon, the expected or actual date of commencement of work and, if no award has been made, whether the Bidder was the lowest monetary Bidder:

Project Bid	Start Date	Low Bidder

17. *Does the Bidder have any projects ongoing at the time of submission of this Bid?*

Yes No

If Yes, please list the projects (or attach) on which the Bidder is currently working, the percentag complete, and the expected date of completion of the work:

Project	Construction Cost	Percent Complete	Completion Date

18. *Has the Bidder, or any company sharing a director, officer, shareholder or principal or Bidder, ever been terminated from a contract or project by any owner?*

Yes No

If Yes, please list the projects on which the Bidder was terminated, the reason for termination (convenience, suspension, for cause), and the date of termination:

Project Bid	Reason	Date

19. *Has the Bidder completed and attached the list of at* ***least three (3) references****?* Bidders must indicate at minimum: job name, location, brief description, dollar amount, and reference names with telephone numbers of the Owner and the Engineer or Architect. This Statement must be signed and submitted with the Bid to be considered responsive

Yes No

SWORN STATEMENT OF BIDDER:

By signing below, the Bidder named above acknowledges that all information supplied in response to this Statement of Bidder's Qualifications, including all attachments, is complete and accurate to the best of Bidder's knowledge. Bidder further represents that it has not filed and does not presently anticipate filing for bankruptcy, and that Bidder's assets are not in receivership. Bidder further certifies that it is not, nor are any of its Subcontractors included in its Bid, a party that has been previously debarred, suspended or found non-responsive or ineligible to participate in NECSD projects, nor does Bidder or any Subcontractor share one or more officers, directors, shareholders or principals with a debarred, suspended, or otherwise ineligible party.

By:
Authorized Name (print):
_____
Title (print):
_____
Authorized Signature:
_____

Sworn to before me this Day of 2018

_____
Notary Public

END OF SECTION 004513

SECTION 00 45 19

APPENDIX E

NON-COLLUSIVE BIDDING/PROPOSAL CERTIFICATION

Section 103-d, General Municipal Law. Statement of non-collusion in bids and proposals to political subdivision of the state. Every bid or proposal hereafter made to a political subdivision of the state or any public department, agency, or official thereof where competitive bidding is required by statute, rule, regulation or local law, for work or services performed or to be performed or goods sold or to be sold, shall contain the following statement subscribed by the bidders and affirmed by such bidder as true under the penalties of perjury,

a. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of any joint bid each party thereto certified as to its own organization, under penalty of perjury, that to the best of 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 another 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 or not to submit a bid for the purpose of restricting competition.

b. Any bid shall not be considered for award nor shall any 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 furnish with the bid a signed statement which sets forth in detail the reason therefor. 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 subparagraph one (a).

   Any bid hereafter made to any political subdivision of the state or any public department, agency or official thereof by a corporate bidder for work or services performed or to be performed or goods sold or to be sold, where competitive bidding is required by statute, rule, regulation or local law, and where such bid contains the certification referred to in subdivision one of the section, shall be deemed to include the signing and submission of the bid and the inclusion as the act and deed of the corporation.

Firm Name: _____

Signed: _____ Title _____

Date: _____

SECTION 004520 - IRAN DIVESTMENT ACT CERTIFICATION

As a result of the Iran Divestment Act of 2012 (Act), Chapter 1 of the 2012 Laws of New York, a new provision has been added to the State Finance Law (SFL), § 165-a, effective April 12, 2012. Under the Act, the Commissioner of the Office of General Services (OGS) will be developing a list (prohibited entities list) of "persons" who are engaged in "investment activities in Iran" (both are defined terms in the law). 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, Bidder/Contractor (or any assignee) certifies that once the prohibited entities list is posted on the OGS website, it will not utilize on such Contract any subcontractor that is identified on the prohibited entities list.

Additionally, Bidder/Contractor is advised that once the list is posted on the OGS website, any Contractor seeking to renew or extend a Contract or assume the responsibility of a Contract awarded in response to the 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 New York State Education Department (AGENCY) receive information that a person is in violation of the above-referenced certification, AGENCY will offer the person an opportunity to respond. If the person fails to demonstrate that it has ceased its engagement in the investment which is in violation of the Act within 90 days after the determination of such violation, then AGENCY shall take such action as may be appropriate including, but not limited to, imposing sanctions, seeking compliance, recovering damages, or declaring the Contractor in default.

AGENCY reserves the right to reject any bid or request for assignment for an entity that appears on the prohibited entities list prior to the award of a contract, and to pursue a responsibility review with respect to any entity that is awarded a contract and appears on the prohibited entities list after contract award.

Signature:_____

Print Name:_____

Title:_____

Company Name:_____

Date: :_____

Note: Include section with Bid Form

END OF SECTION

ADDITIONAL BID FORMS

APPENDIX A (FORM A)

Offerer's Affirmation of Understanding of and
Agreement Pursuant to State Finance Law §139-j(6)(b)

Background:

State Finance Law §139-j(6)(b) provides that:

Every Governmental Entity (including, voluntarily, the Newburgh Enlarged City School District,(the "Board") shall seek written affirmations from all Offerors as to the Offeror's understanding of and agreement to comply with the Board's procedures relating to permissible contracts during a Governmental Procurement pursuant to State Finance Law §139-j(3).

Instructions:

In connection with all proposals, bids, RFP's, etc., the Board must obtain the following affirmation of understanding and agreement to comply with procedures on procurement lobbying restrictions regarding permissible contacts in the Restricted Period for a Procurement Contract in accordance with State Finance Law §139-j and §139-k:

Offerer affirms that it understands and agrees to comply with the Newburgh Enlarged City School District Board's Procurement Disclosure Policy, which Policy conforms to the requirements of State Finance Law §139-j (3) and §139-j(6)(b).

BY

*LEGAL NAME OF FIRM OR CORPORATION	AUTHORIZED SIGNATURE
ADDRESS	TYPED NAME OF AUTHORIZED SIGNATURE/TITLE
CITY, STATE, ZIP CODE	TELEPHONE/DATE

*Indicate the complete legal name of your firm or corporation. Do not abbreviate. If a corporation, use name as it appears on corporate seal.

APPENDIX B (Form B)

Offerer Certification of Compliance with
State Finance law §139-k(5)

By signing below, I certify that all information provided to the Newburgh Enlarged City School District with respect to State Finance Law §139-k is complete, true and accurate.

BY

*LEGAL NAME OF FIRM OR CORPORATION	AUTHORIZED SIGNATURE
ADDRESS	TYPED NAME OF AUTHORIZED SIGNATURE/TITLE
CITY, STATE, ZIP CODE	TELEPHONE/DATE

*Indicate the complete legal name of your firm or corporation. Do not abbreviate. If a corporation, use name as it appears on corporate seal.

SECTION 00 45 22

APPENDIX F

PROPOSER WARRANTIES

A. Proposer warrants that it is willing and able to comply with State of New York laws and regulations.

B. Proposer warrants that it is willing and able to obtain an error and omissions insurance policy providing a prudent amount of coverage for the willful or negligent acts, or omissions of any officers, employees or agents thereof.

C. Proposer warrants that it will not delegate or subcontract its responsibilities under an agreement without the express prior written permission of the Newburgh Enlarged City School District.

D. Proposer warrants that all information provided by it in connection with this proposal is true and accurate.

_____
Firm's Name

_____
Address

_____
City, State, **Zip**

_____
(Print Name) (Signature)

(Fax)
_____
(Phone)

Section 00 45 23

APPENDIX H

Sexual **Harassment Certification**

In accordance with State Finance Law §138-1, which generally prohibits the School District from entering into contracts pursuant to the bid/RFP process with persons who fail to submit a certification affirming compliance with New York State Labor Law §201-g, the proposer submit the following certification under the penalty of perjury:

> By submission of this proposal, each proposer and each person signing on behalf of any proposer, certifies, and in the case of a joint bid/proposal each party thereto certifies as to its own organization, under penalty of perjury, that the proposer has implemented written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment training to all of its employees. Such policy shall, at a minimum, meet the requirements of Section 201-g of the NYS Labor Law.

Dated:_____, New York
_____, 2024

_____
Firm's Name

_____
(Print Name) (Signature)

Sworn to before me this ___
day of_____,
2024

_____
Notary Public

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of_____)

County of_____) ss.:

City of_____)

On this day_____ day of_____, 20 before me personally came and appeared_____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 one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said corporation, and that he signed his name thereto by like order.

(SEAL)

_____
Notary Public

ACKNOWLEDGMENT OF PRINCIPAL, IF A FIRM

State of_____)

County of_____) ss.:

City of_____)

On this day_____ day of_____, 20 before me personally came and appeared_____to me known and known to me to be one of the members of the firm of_____described in and who executed the foregoing instrument and he acknowledged to me that he executed the same as and for the act and deed of said firm.

(SEAL)

_____
Notary Public

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of_____)

County of_____) ss.:

City of_____)

On this day_____day of_____, 20_before me personally came and appeared_____to me known and known to me to be the person described in and who executed the foregoing instrument and acknowledged that he executed the same.

(SEAL)

_____
Notary Public

SURETY ACKNOWLEDGMENT

State of_____)

County of_____) ss.:

On this day_____day of_____, 20___, before me personally came _____ to me known, who, being by me duly sworn, did depose and say that he is an attorney-in-fact of _____the corporation described in and which executed the within instrument; that he knows the corporate seal of said corporation; that the seal affixed to the within instrument is such corporate seal, and that he signed the said instrument and affixed the said seal as Attorney-in-Fact by authority of the Board of Directors of said corporation and by authority of this office under the Standing Resolutions thereof.

(SEAL)

_____
Notary Public

DOCUMENT 004544 – INSURANCE AFFIDAVIT

(a) By submission of this Bid, the Bidder certifies the following;

(1) They have read, understand, and can provide the insurance required by the bid documents.

(2) All subcontractors retained by the Bidder are able to and will provide insurance with the same limits as the Bidder.

(3) All insurance certificates for subcontractors shall be submitted for review and approval a minimum of four weeks prior to the date that the subcontractor is scheduled to begin work on site.

(4) Failure to provide the required insurance certificates in a timely manner will not be justification for an extension of time.

(3) The insurance requirements are part of the contract requirements and are not open to negotiation.

Signature___ Date

_____ Title _____

_____Federal ID No.: _____ Company:_____

_____ Business Address:_____

_____

Telephone:_____ Email:_____

END OF DOCUMENT 004544

SECTION 005200 AGREEMENT FORM

PART 1 - GENERAL

1.1 SUMMARY

A. Attached is AIA Document A132-2009, Agreement Form.
   1. AIA Document A132-2009 defines the relationships and obligations existing between the Owner and the Contractor.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 005200

AIA® Document A132™ – 2019

Standard Form of Agreement Between Owner and Contractor,
Construction Manager as Adviser Edition

AGREEMENT made as of the « XX » day of «XX » in the year « 2024 »
(In words, indicate day, month, and year.)

BETWEEN the Owner:
(Name, legal status, address, and other information)

«Newburgh Enlarged CSD (NECSD) »
«124 Grand Street »
«Newburgh, NY 12550 »

and the Contractor:
(Name, legal status, address, and other information)

TBD

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

«Newburgh Enlarged CSD»
Proposition 5 - 2019 Capital Improvements Project
HVAC Upgrades
SED Project Control No(s).
Gidney Ave. Memorial School SED #44-16-00-01-0-006-015
Temple Hill School (525 Union Ave, New Windsor, NY 12553)
44-16-00-01-0-036-015
Meadow Hill School (124 Meadow Hill Rd, Newburgh, NY 12550)
44-16-00-01-0-035-014

The Construction Manager:
(Name, legal status, address, and other information)

Jacobs
One Penn Plaza
24th Floor, Suite 2400
New York, NY 10119
United States

The Architect:
(Name, legal status, address, and other information)

«LaBella Associates, D.P.C»
«4 British American Blvd.»
«Latham NY 12110»

The Owner and Contractor agree as follows.

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

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

This document is intended to be used in conjunction with AIA Documents A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser. AIA Document A232™–2019 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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TABLE OF ARTICLES

1 THE CONTRACT DOCUMENTS

2 THE WORK OF THIS CONTRACT

3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

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6 DISPUTE RESOLUTION

7 TERMINATION OR SUSPENSION

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9 ENUMERATION OF CONTRACT DOCUMENTS

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 DATES OF SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[X] The date of this Agreement.

[« »] A date set forth in a notice to proceed issued by the Owner.

[« »] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

« »

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion of the Project or Portions Thereof

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the date of Substantial Completion of the Work of all of the Contractors for the Project will be:
(Insert the date of Substantial Completion of the Work of all Contractors for the Project.)

« »

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§ 3.4.3 If the Contractor fails to substantially complete the Work of this Contract, or portions thereof, as provided in this Section 3.4, liquidated damages, if any, shall be assessed.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be one of the following:
(Check the appropriate box.)

[X] Stipulated Sum, in accordance with Section 4.2 below

[« »] Cost of the Work plus the Contractor's Fee, in accordance with Section 4.3 below

[« »] Cost of the Work plus the Contractor's Fee with a Guaranteed Maximum Price, in accordance with Section 4.4 below

(Based on the selection above, complete Section 4.2, 4.3 or 4.4 below.)

§ 4.2 Stipulated Sum

§ 4.2.1 The Contract Sum shall be xxx ($), subject to additions and deductions as provided in the Contract Documents.

§ 4.2.2 Alternates

§ 4.2.2.1 N/A

§ 4.2.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price

§ 4.2.4 Unit prices, if any:
(Identify the item and state the unit price, and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Construction Manager by the Contractor, and Certificates for Payment issued by the Construction Manager and Architect, the Owner shall make progress payments on account of the Contract Sum, to the Contractor, as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month.

§ 5.1.3 Provided that an Application for Payment is received by the Construction Manager not later than the last day of a month for work up to that date, the Owner shall make payment of the amount certified to the Contractor not later than the last day of the following month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment of the amount certified shall be made by the Owner not later than Forty-Five (45) days after the Construction Manager receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

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§ 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 and approved by Construction Manager and Architect. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Construction Manager and Architect may require. This schedule of values 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 In accordance with AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.4.3.1 The amount of each progress payment shall first include:

.1 That portion of the Contract Sum properly allocable to completed Work;

.2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing, must have written attestation from Construction Manager that materials and equipment have been readily inspected and include photographs of the items clearly labeled for the Owner (NECSD); and

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.4.3.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019; and

.5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to when the Work of this Contract is substantially complete, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

« **5%** »

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

N/A

§ 5.2 Final Payment

§ 5.2.1 Final Payment Where the Contract Sum is Based on a Stipulated Sum

§ 5.2.1.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

.1 the Construction Manager, Architect and Owner have accepted in writing the Contractor has completed the work as described in the Punch List, and all Close Out documentation has been received by the Owner.

.2 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect;

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§ 5.2.1.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment.

« »

§ 5.3 Notwithstanding the above, all payments shall be made to the Contractor consistent with the requirements of General Municipal Law §106-b..

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as Initial Decision Maker pursuant to Article 15 of AIA Document A232–2019, 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.)

N/A

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A232–2019, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[« »] Arbitration pursuant to Article 15 of AIA Document A232–2019.

[« X »] Litigation in a court of competent jurisdiction.

[« »] Other: *(Specify)*

« »

If the Owner and Contractor do not select a method of binding dispute resolution, 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.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 Where the Contract Sum is a Stipulated Sum

§ 7.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2019.

§ 7.1.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A232–2019, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

N/A

§ 7.1.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2019.

§ 7.2.1.3 Termination by the Owner for Convenience

If the Owner terminates the Contract for convenience in accordance with Article 14 of AIA Document A232–2019, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of or method for determining the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

« The value of the work that has actually been performed to date of termination, value of stored materials if accepted by the Architect and documented in writing by Construction Manager, and negotiated overhead and profit rate.»

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§ 7.3 Suspension

The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2019; in such case, the Contract Sum and Contract Time shall be increased as provided in Article 14 of AIA Document A232–2019, except that the term "profit" shall be understood to mean the Contractor's Fee as described in Section 4.3.2 or 4.4.2, as applicable, of this Agreement.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2019 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

Newburgh ECSD
Lori Gonzalez
Capital Projects Manager
124 Grand Street
Newburgh NY 12550
(845) 568-6710
lgonzalez@necsd.net

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

TBD

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A232™–2019, General Conditions, Construction Manager as Adviser Edition.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A232™–2019. General Conditions, Construction Manager as Adviser Edition.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A232–2019, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:
(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

N/A

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition

.2 AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition

.3 Drawings

Number	Title	Date

.4 Specifications

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User Notes: (1430480691)

Section	Title	Date	Pages

.5 Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.6 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[« X »] AIA Document A132™–2019, Exhibit "A" – Project Labor Agreement

.7 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A232–2019 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

« »

This Agreement is entered into as of the day and year first written above.

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
Newburgh Enlarged City School District Dr. Jackielyn Manning Campbell, Superintendent	« »« »
(Printed name and title)	*(Printed name and title)*

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DRAFT

AIA® Document A312® – 2010

Performance Bond

CONTRACTOR:
(Name, legal status and address)

« »« »
« »

SURETY:
(Name, legal status and principal place of business)

« »« »
« »

OWNER:
(Name, legal status and address)

« »« »
« »

CONSTRUCTION CONTRACT
Date: « »
Amount: $ « »
Description:
(Name and location)

« »
« »

BOND
Date:
(Not earlier than Construction Contract Date)
« »
Amount: $ « »
Modifications to this Bond: « » None « » See Section 16

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:	« »« »	Name and Title:	« »« »

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or **BROKER:**

« »
« »
« »

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

« »
« »
« »
« »
« »
« »

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

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.

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User Notes: (1266052181)

§ 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.

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§ 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.

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§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

« »

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:	« »« »	Name and Title:	« »« »
Address:	« »	Address:	« »

DRAFT

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User Notes: (1266052181)

DRAFT

AIA® Document C106™ – 2022

Digital Data Licensing Agreement

AGREEMENT made as of the « » day of « » in the year « »
(In words, indicate day, month, and year.)

BETWEEN the Party transmitting Digital Data ("Transmitting Party"):
(Name, address, and contact information, including electronic addresses)

« »
« »
« »
« »
« »

and the Party receiving the Digital Data ("Receiving Party"):
(Name, address, and contact information, including electronic addresses)

« »
« »
« »
« »
« »

for the following Project:
(Name and location or address of the Project)

« »
« »

for the following Digital Data ("Digital Data"):
(Identify below, in detail, the information created or stored in digital form that the Parties intend to be subject to this Agreement.)

« »

The Transmitting Party and Receiving Party agree as follows.

TABLE OF ARTICLES

1 GENERAL PROVISIONS

2 TRANSMISSION OF DIGITAL DATA

3 LICENSE CONDITIONS

4 LICENSING FEE OR OTHER COMPENSATION

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 The purpose of this Agreement is to grant a license from the Transmitting Party to the Receiving Party for the Receiving Party's use of Digital Data and to set forth the license terms.

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

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

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§ 1.2 This Agreement is the entire and integrated agreement between the Parties. Except as specifically set forth herein, this Agreement does not create any other contractual relationship between the Parties.

§ 1.3 Confidential Digital Data is Digital Data containing confidential or business proprietary information that the Transmitting Party designates as "confidential."

ARTICLE 2 TRANSMISSION OF DIGITAL DATA

§ 2.1 The Transmitting Party grants to the Receiving Party a nonexclusive limited license to use the Digital Data solely and exclusively for the uses, and in accordance with the terms, set forth in Article 3.

§ 2.2 Only the Receiving Party is permitted to access and use the Digital Data. Unlicensed and unauthorized access or use by third parties is strictly prohibited except as set forth in Section 2.4.1.

§ 2.3 The transmission of Digital Data constitutes a warranty by the Transmitting Party to the Receiving Party that the Transmitting Party is the copyright owner of the Digital Data or otherwise has permission to transmit the Digital Data to the Receiving Party for its use on the Project in accordance with the terms and conditions of this Agreement.

§ 2.4 Where the Transmitting Party has designated information furnished pursuant to this Agreement as "confidential," the Receiving Party shall keep the information confidential and shall not disclose it to any other person or entity except as set forth in Section 2.4.1.

§ 2.4.1 The Receiving Party may disclose Confidential Digital Data after seven (7) days' notice to the Transmitting Party where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Receiving Party may also disclose Confidential Digital Data to its employees, consultants, sureties, subcontractors and their employees, sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.5 By transmitting Digital Data, the Transmitting Party does not convey any ownership right in the Digital Data or in the software used to generate the Digital Data. Unless otherwise granted in a separate license, the Receiving Party's right to use, modify, or further transmit Digital Data is specifically limited to those uses, and in accordance with the terms, set forth in Article 3, and nothing contained in this Agreement conveys any other right to use the Digital Data.

§ 2.6 To the fullest extent permitted by law, the Receiving Party shall indemnify and defend the Transmitting Party from and against all claims arising from or related to the Receiving Party's modification to, or unlicensed use of, the Digital Data.

§ 2.7 Transmission of the Digital Data does not abridge or extinguish the Transmitting Party's rights, including, to the extent applicable, exclusive ownership interest, in such information under all applicable state, federal, and international laws including, without limitation, laws governing the protection of copyrights and intellectual property.

§ 2.8 The provisions of this Article 2 shall survive the termination of this Agreement.

ARTICLE 3 LICENSE CONDITIONS

§ 3.1 The Receiving Party may use and rely upon the Digital Data to the extent set forth in this Article 3. *(Choose only one option below.)*

[« »] **§ 3.1.1** The Digital Data is transmitted solely for the Receiving Party's information. Receiving Party acknowledges that any use of the Digital Data shall be at Receiving Party's sole risk. The Receiving Party accepts the Digital Data "as is" without any warranty or representations from the Transmitting Party as to whether the Digital Data is accurate, complete, or fit for use as intended by the Receiving Party. The Receiving Party is solely responsible for verifying whether the Digital Data is accurate, complete, or fit for the Receiving Party's intended use.

[« »] **§ 3.1.2** Other:

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(Identify terms, permitted uses, or other conditions related to the Digital Data.)

« »

§ 3.2 If no specific terms or uses are selected or set forth in Section 3.1, then the Receiving Party may use the Digital Data at its sole risk pursuant to the terms and conditions set forth in Section 3.1.1.

ARTICLE 4 LICENSING FEE OR OTHER COMPENSATION

The Receiving Party agrees to pay the Transmitting Party the following fee or other compensation for the Receiving Party's use of the Digital Data:
(State the fee, in dollars, or other method by which the Receiving Party will compensate the Transmitting Party for the Receiving Party's use of the Digital Data.)

« »

This Agreement is entered into as of the day and year first written above and terminates one year from said date, except as set forth below.
(Indicate when this Agreement will terminate, if other than one year from the date it was entered into, and other conditions related to termination.)

« »

TRANSMITTING PARTY *(Signature)*	**RECEIVING PARTY** *(Signature)*
« »« »	« »« »
(Printed name and title)	*(Printed name and title)*

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SECTION 006211 – SUBMITTAL COVER SHEET

LaBella
Powered by partnership.

SUBMITTAL COVER
(Attach to each submitted)

4 British American Blvd., Latham NY 12110
Phone 518-5404922
www.labellapc.com

Contractor's Submittal No. _____

A/E Submittal No. _____

Contractor:
Address:

Phone / Fax: ( ) _____ ( ) _____

Newburgh Enlarged CSD
District Wide A/C – Electrical Upgrades
LBA Project No. 2233600

Type of Submittal
(check one)

☐ Product Data ☐ Color Selection ☐ O&M Manual

☐ Shop Drawings ☐ Sample ☐ Record Document

☐ Other

Date of Submittal: _____

Resubmitted: _____

Number of Attached: _____

Substitution ☐ Yes ☐ No
See General Conditions

Product Identification
Specification Section No.: _____
Contract Dwg. No.: _____
Product Name: _____
Part/Paragraph: _____
Detail Reference: _____
Manufacturer: _____

Contractor Approval
Identify that this submittal has been approved by the Contractor in accordance with the General Conditions

By: _____ Date: _____

Deviation From Contract Documents: (If Any)

Contractor Comments:

(A/E Use Only)

☐ REVIEWED ☐ REVISE AND RESUBMIT
☐ REJECTED ☐ FURNISH AS NOTED

Corrections or comments made on the shop drawings during this review do not relieve the contractor from compliance with requirements of the drawings and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.

LaBella Associates, D.P.C.

By: _____ Date: _____

Architect / Engineer Comments

AIA® Document G702® – 1992

Application and Certificate for Payment

TO OWNER: Newburgh Enlarged CSD

124 Grand Street

Newburgh, New York 12550

PROJECT: Newburgh ECSD – District Wide – A/C Electrical Upgrades

PERIOD TO: Site Work

APPLICATION NO:

Distribution to:

OWNER: ☐

ARCHITECT: ☐

CONTRACTOR: ☐

FIELD: ☐

OTHER : ☐

CONTRACT FOR:

CONTRACT DATE:

FROM CONTRACTOR:

VIA ARCHITECT: LaBella Associates, DPC
21 Fox Street
Poughkeepsie, NY 12601

PROJECT NOS: 2233600
SED#44-16-00-01-0-006-015
SED#44-16-00-01-0-035-014
SED#44-16-00-01-0-036-015

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
AIA Document G703®, Continuation Sheet, is attached.

1. ORIGINAL CONTRACT SUM	
2. NET CHANGE BY CHANGE ORDERS	0.00
3. CONTRACT SUM TO DATE (Line 1 ± 2)	0.00
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)	0.00
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 of G703)	0.00
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total)	0.00
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)	0.00
8. CURRENT PAYMENT DUE	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:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's 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.

9. BALANCE TO FINISH, INCLUDING RETAINAGE

(Line 3 less Line 6) 0.00

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	0.00	0.(
Total approved this Month	0.00	0.(
TOTALS	0.00	0.(
NET CHANGES by Change Order		0.(

AMOUNT CERTIFIED ..... -
0.00

(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.)

ARCHITECT:

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.

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AIA® Document G703® – 1992

Continuation Sheet

AIA Document G702®, Application and Certification for Payment, or G732™, Application and Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO: 2233600

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED FROM PREVIOUS APPLICATION (D + E)	WORK COMPLETED THIS PERIOD	MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D + E + F)	% (G÷C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
	GRAND TOTAL	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**0.00%**	**$0.00**	**$0.00**

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User Notes: (3B9ADAAE)

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SECTION 006319 - REQUEST FOR EQUIVALENT REVIEW FORM

Note: Use separate form for each material, product or equipment item submitted for review.

Date: _____ Request No.: _____

Project:
_____

Location:_____

Name of material, product or equipment item submitted as an equivalent:
_____

Name of material, product or equipment item specified:
_____

Specification Section_____, Article_____, Paragraph_____

Qualities that differ from specified product or system, if any:
_____

_____

_____

_____

_____
Name of Manufacturer / Fabricator

_____
Address

_____
City State Zip Code

Phone: _____ E-mail: _____

_____
Name of Vendor / Supplier

_____
Address

_____
City State Zip Code

Phone: _____ E-mail: _____

Reason for requesting consideration of proposed equivalent:

_____

_____

_____

_____

Proposed equivalent will affect other materials or systems, such as dimensional revisions, redesign of structure, or modifications to other work:

_____No

_____Yes, describe requirements:

_____

_____

_____

_____

Savings or credit to Contract Sum for accepting proposed equivalent, if any:

_____

_____ ($_____)
Dollars Amount in words Amount in Figures

The attached data is furnished herewith for evaluation of the proposed equivalent:

Product Data _____, Drawings _____, Samples _____, Tests _____, Reports _____

Other Information:

_____

_____

_____

_____

_____

_____

The undersigned hereby certifies:

1. The proposed equivalent has been fully investigated and is considered equal or superior to specified brand, material, product or equipment item.

2. The same or better warranty will be furnished for proposed equivalent as for specified brand, material, product or equipment.

3. All changes in the work resulting from the use of this equivalent, if approved, will be coordinated and completed in all respects and all costs, including, but not limited to, those for additional services rendered by the Architect are the responsibility of this Contractor at no additional compensation under the Contract.

_____ _____
Contractor Signed by

_____
Address

_____
City State Zip Code

Phone: _____ E-mail: _____

END OF SECTION 006319

AIA® Document G706' –J994

Contractor's Affidavit of Payment of Debts and Claims

PROJECT: *(Name and address)*
Newburgh Enlarged City School District

ARCHITECT'S PROJECT NUMBER:
108-2303

OWNER: @
ARCHITECT: @
CONTRACTOR: @
SURETY'
OTHER: @

District Wide A/C – Electrical Upgrades

Gidney Avenue School	Meadow Hill Gem School	Temple Hill Academy
300 Gidney Avenue	124 Meadow Hill Road	525 Union Avenue
Newburgh, New York 12550	Newburgh, NY 12550	New Windsor, NY 12553
SED#44-16-00-01-0-006-015	SED#44-16-00-01-0-035-014	SED# 44-16-00-01-0-036-015

LaBella Associates DPC. Project No. 2233600

CONTRACT FOR:
CONTRACT DATED:

TO OWNER: *(Name and address)*
Newburgh Enlarged City School District
124 Grand Street
Newburgh, New York 12550

STATE OF: New **York**
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 Q Yes QQ 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:

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DRAFT

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Contractor's Affidavit of Release of Liens

PROJECT: *(Name and address)*	**ARCHITECT'S PROJECT NUMBER:**	OWNER: ☐
		ARCHITECT: ☐
	CONTRACT FOR:	
TO OWNER: *(Name and address)*	**CONTRACT DATED:**	CONTRACTOR: ☐
		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:

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AIA® Document G707 – 1994

Consent Of Surety to Final Payment

PROJECT: (Name *and address)*
Newburgh Enlarged City School District

District Wide A/C – Electrical Upgrades

Gidney Avenue School
300 Gidney Avenue
Newburgh, NY 12550
SED#44-16-00-01-0-006-015

Temple Hill Academy
525 Union Avenue
New Windsor, NY 12553
SED# 44-16-00-01-0-036-015

LaBella Associates DPC. Project No. 2233600

ARCHITECT'S PROJECT NUMBER: 2233600

Meadow Hill Gem School
124 Meadow Hill Road
Newburgh, NY 12550
SED#44-16-00-01-0-035-014

CONTRACT FOR:

CONTRACT DATED:

OWNER: @
ARCHITECT: @
CONTRACTOR: @
SURETY:
OTHER: @

TO OWNER: *(name and address)*
Newburgh Enlarged City School District
124 Grand Street
Newburgh, New York 12550

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of surety)

, SURETY,

on bond of
(Insert name and address of Contractor)

, CONTRACTOR,

hereby approves of the final **payment to** the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety of any of its **obligations** to
Newburgh Enlarged City School District
124 Grand Street
Newburgh, NY 12550

, OWNER,

as set forth in said Surety's bond.

IN **WITNESS WHEREOF,** the Surety has hereunto set its hand on this date:
(Insert in writing the month followed by the numeric date and year.)

(Surety)

(Signature of authorized representative)

Attest:
(Seal):

(Printed name and title)

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SECTION 007216 GENERAL CONDITIONS OF THE CONTRACT

PART 1 - GENERAL

1.1 SUMMARY

A. Attached is AIA Document A232-2009, General Conditions of the Contract for Construction.

1. AIA Document A232-2009 defines the rights, responsibilities and relationships of the parties to the Contract for this Project.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 007216

PROJECT LABOR AGREEMENT

COVERING CONSTRUCTION

OF

CAPITAL CONSTRUCTION PROJECTS

NEWBURGH ENLARGED CITY SCHOOL DISTRICT

FINAL

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(Pages to be verified prior to signatures)

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PREAMBLE

WHEREAS, Newburgh Enlarged City School District ("NECSD"), desires to provide for the cost efficient, safe, quality, and timely completion of certain construction work described herein relating to the Capital Construction Projects approved by the qualified voters of NECSD on May 21, 2019 ("The Project") in a manner designed to afford the lowest reasonable costs to the NECSD, and the public it represents, and the advancement of permissible statutory objectives;

WHEREAS, NECSD engaged Arace & Company ("Arace") to undertake a study of whether the use of a Project Labor Agreement will best serve the NECSD's interest in obtaining the best work at the lowest possible price, preventing favoritism, fraud and corruption, and other considerations such as the impact of delay, the possibility of cost saving advantages, and any local history of labor unrest; and

WHEREAS, "Arace" Due Diligence Assessment of the Impacts and Implementation of a Project Labor Agreement, (the "study") dated May 20, 2020 ("Report"), concluded that use of a Project Labor Agreement would provide the NECSD with measurable economic benefits and would promote the NECSD's interest in obtaining the best work at the lowest prices as well as preventing favoritism, fraud and corruption; and

WHEREAS, NECSD has carefully reviewed and considered "Arace" Report and determined, among other things, that NECSD's interest in obtaining the best work at the lowest possible price, preventing favoritism, fraud and corruption, preventing the impact of delay, avoiding labor unrest, and gaining measurable management flexibility and benefits are best met by requiring a Project Labor Agreement and, therefore, directs that a Project Labor Agreement be made part of the Project; and;

WHEREAS, this Project Labor Agreement will foster the achievement of these goals, inter alia, by:

(1) expediting the construction process and otherwise minimizing the disruption to the project;

(2) avoiding the costly delays of potential strikes, slowdowns, and walkouts arising from work disputes and promoting labor harmony and peace for the duration of the project;

(3) standardizing the terms and conditions governing the employment of labor on the project;

(4) permitting flexibility in work scheduling where necessary at affordable pay rates;

(5) permitting adjustments to work rules and staffing requirements from those which otherwise might obtain;

(6) providing comprehensive and standardized mechanisms for the settlement of work disputes, including those relating to jurisdiction;

(7) Promoting work opportunities for those within the district

(8) ensuring a reliable source of skilled and experienced labor;

WHEREAS, Newburgh Enlarged City School District, has, through independent investigation and analysis, determined the substantial cost savings to the Project shall result from the application of this Agreement; and

WHEREAS, the New York State Building and Construction Trades Council, the Hudson Valley Building & Construction Trades Council, and its affiliated Local Unions and their members, desire to provide for stability, security and work opportunities which are afforded by a Project Labor Agreement; and

WHEREAS, the Parties desire to maximize project safety conditions for both workers and others;

NOW, THEREFORE, the Parties enter into this Agreement:

ARTICLE 1 – PARTIES TO THE AGREEMENT

SECTION 1.1 PARTIES TO THE AGREEMENT

This is a Project Labor Agreement ("Agreement") entered into for all construction as part of the Capital Construction Bond Project (as defined below) between (i) the Newburgh Enlarged City School District ("NECSD") (ii) the Hudson Valley Building and Construction Trades Council ("Council") on behalf of itself and its affiliated Local Unions ("Local Unions"); and (iii) the signatory Local Unions on behalf of themselves and their members.

ARTICLE 2 - GENERAL CONDITIONS

SECTION 2.1 DEFINITIONS

Throughout this Agreement:

(A) "Union Parties" and "Unions" means the Hudson Valley Building & Construction Trades Council, AFL-CIO and the signatory Local Unions, individually and collectively;

(B) "Local Union(s)" means the Local Unions signatory to this Agreement, individually and collectively;

(C) "The Project" means the work to be performed in connection with construction of the Capital Construction Project as more fully set forth in Article 3, Section 3.1.

(D) "Project Work" means the work covered by this Agreement and fully defined

in Article 3, Section 3.1;

(E) "Contractor(s)" means any General Contractor, Prime Contractor, Construction Manager (or any Contractor who may serve as a successor in that role), and all other contractors and subcontractors of whatever tier engaged in Project Work within the scope of this Agreement as defined in Article 3;
(F) "Council" means the Hudson Valley Building & Construction Trades Council, AFL-CIO.
(G) "Owner" means Newburgh Enlarged City School District ("NECSD").
(H) "Owner's Representative" means any Construction Manager or other entity designated by the Owner to enter into this Agreement or otherwise act on its behalf.

SECTION 2.2 CONDITIONS FOR AGREEMENT TO BECOME EFFECTIVE

This Agreement shall not become effective unless each of the following conditions are met: (1) the Agreement is signed by the Council and the Local Unions having jurisdiction over the Project Work; (2) the Agreement is approved by the NYS Building & Construction Trades Council (NYSBCTC); (3) the Agreement is approved by the Building & Construction Trades Department (BCTD); (4) the Agreement is authorized by the Owner and (5) the Agreement is signed by the Construction Manager (CM)

SECTION 2.3 ENTITIES BOUND & ADMINISTRATION OF AGREEMENT

This Agreement shall be binding on all signatory Unions and their affiliates and all Contractors performing Project Work as defined in Article 3. The Contractors shall include in any subcontract that they let for performance during the term of this Agreement a requirement that their subcontractors, of whatever tier, become signatory and bound by this Agreement with respect to that subcontracted work performed within the scope of Article 3, and require that each subcontractor, of whatever tier, sign a letter of assent (Schedule B). This Agreement shall be administered by the Designee named by the Owner pursuant to Schedule C.

SECTION 2.4 SUPREMACY CLAUSE

This Agreement, together with the local Collective Bargaining Agreements appended hereto and referred to herein as "Schedule A" represents the complete understanding with respect to the Project and supersedes any national agreement, local agreement, or other collective bargaining agreement of any type which would otherwise apply to Project Work, in whole or in part, with the following exception: to the extent a Contractor is a signatory to the NTL Articles of Agreement, the National Stack/Chimney Agreement, the National Cooling Tower Agreement, the UA/IBEW Joint National Agreement for Instrument and Control Systems Technicians, and the National Agreement of the International Union of Elevator Constructors, those agreements shall apply.

Notwithstanding this exception, Articles 7, 9, and 10 of this Agreement shall also apply. Where a subject covered by the provisions of this Agreement is also covered by a Schedule A, the provisions of this Agreement shall prevail. If this Agreement is silent on any matter addressed in the applicable Schedule A agreement, the Schedule A agreement shall govern. It is understood that by virtue of having become bound by this Project Labor Agreement, the Contractors will not be obligated to sign any other local, area, or national agreement.

SECTION 2.5 LIABILITY

The liability of any Contractor and the liability of any Union under this Agreement shall be several and not joint. The Contractors, and Subcontractors shall not be liable for any violations of this Agreement by any other Contractor or Subcontractor; and the Council and Local Unions shall not be liable for any violations of this Agreement by any other Union. Notwithstanding the above, every signatory to the Agreement further acknowledges that it will be liable for its own breach, partial breach or otherwise, whether related or not to the breach of another signatory.

SECTION 2.6 THE BID SPECIFICATIONS

The Owner shall require in its bid specifications for all Project Work within the scope of Article 3 that all successful bidders and their Subcontractors of whatever tier become bound by, and signatory to, this Agreement. Every Contractor shall require its Subcontractors, of whatever tier, to execute the Letter of Assent in Schedule B and to become bound by this Agreement.

SECTION 2.7 AVAILABILITY AND APPLICABILITY TO ALL SUCCESSFUL BIDDERS

This Agreement shall be binding on all signatory Unions and their affiliates, and all Contractors, unions and/or non-unions performing Project Work. Unless expressly provided for in this Agreement, this Agreement shall not apply to the work of any Contractor which is performed at any location other than the site of Project Work.

ARTICLE 3 - SCOPE OF THE AGREEMENT

SECTION 3.1 PROJECT WORK

This Agreement shall only apply to Project Work as defined in this Article.

Subject to the exclusions in this Article, Project Work means solely that work performed in connection with construction of the Capital Construction Projects as approved by the Bond vote on May 21, 2019 and included in the contract documents bid on the Capital Construction Projects.

Specifically excluded from coverage under this Agreement is:

(a) all work relating to bids solicited and/or work awarded prior to the execution of this Agreement by the parties and/or approval of it by NECSD,

(b) maintenance and repair work performed in the normal course of NECSD's operations,

(c) any work to be completed by the NECSD or any of its term maintenance contractors and/or vendors,

(d) any computers, work shop equipment tied to computers CNC machines, 3d related equipment, robotic equipment, donated hospital or nursing equipment, printers, monitors, data switching equipment, wireless access points which shall be installed by others (except contractors would install any associated mounting hardware, brackets etc. and provide interconnecting cabling and conduit).

(e) pool construction bid prior to execution of this agreement.

SECTION 3.2 TIME LIMITATIONS

To be covered by this Agreement, Project Work must be awarded after the effective date of this Agreement.

This Agreement shall expire upon completion and acceptance by the Owner of any Project component. The Agreement shall not have further force or effect on such items or areas except where inspections, additions, repairs, modifications, check-out and/or warranty work are assigned in writing (copy to Local Union involved) by the CM for explicit performance under the terms of this Agreement. This Agreement may be extended by written mutual agreement of the parties.

Due to the uncertainty of future funding, uncertainties related or due to the COVID 19 pandemic and the length of the project, the parties to this agreement agree to meet upon notice from NECSD or the construction manager for the purpose of amending the agreement.

SECTION 3.3 EXCLUDED EMPLOYEES

Notwithstanding the provisions of Section 3.1 of this Article, the following person/entities are not subject to the provisions of this Agreement even though performing work on or in connection with the Project:

a. Superintendents, supervisors (excluding general and forepersons specifically covered by a craft's Schedule A), engineers, inspectors and testers, quality control/assurance personnel, timekeepers, mail carriers, clerks, office workers, messengers, guards employed by Owner, technicians, non-manual employees, and all professional, engineering (except field surveyors), administrative and management persons;

b Employees of the Project Owner;

c. Employees and entities engaged in off-site manufacture, modifications, repairs, maintenance, or painting, handling or fabrication of project components, materials, equipment, or machinery or any deliveries including local deliveries of all major construction materials such as fill, ready mix, asphalt, concrete and other aggregates except when any of the above project work is covered under New York State Labor Law 220 (Prevailing Wage) it shall be covered under this Agreement.

d. Employees of the Construction Manager, except those performing manual, on- site construction labor who will be covered by this Agreement;

e. Employees engaged in on-site equipment warranty work;

f. Employees engaged in geophysical testing (whether land or water) other than boring for core samples;

g. Employees engaged in laboratory or specialty testing or inspections, unless ordinarily done by a member of a Trade Union;

h. Employees engaged in ancillary Project Work performed by third parties such as electric utilities, gas utilities, telephone companies, and railroads. Utility work provided by gas, electric, and cable companies, which is not performed by utility company employees, shall be subject to the terms of this Agreement.

Unless specifically excluded in this Agreement, all furniture, fixtures, and equipment that are fastened, mounted, or adhered to a surface by glue, screws, nails, mechanical fasteners, or by any other means shall be included as covered work under this Agreement. This shall include all unloading, loading, transporting to place of install, clean-up, uncrating, and unwrapping of protective coverings. The above items that are not fastened, mounted, or adhered to a surface shall be excluded from this Agreement. This shall not preclude the Owner from using respective unions to unload, carry, place, or clean-up of these items, unless such services are performed directly by the Owner or by a vendor working on State Contract which may not be party to this Agreement.

i. Employees and consultants engaged in security and control services manufacturing and installation if not included in or part of the Contractors contract, except for the installation of conduit-cable related to security and controls which shall be covered work under this agreement.

j. Employees and entities engaged in the removal of all on-site construction debris, waste materials or onsite soils or materials except when this work is covered under New York State Labor Law 220 (Prevailing Wage) it shall be covered under this Agreement.

k. Employees of contractors performing excluded work under Article 3.1d

ARTICLE 4 - UNION RECOGNITION AND EMPLOYMENT

SECTION 4.1 PRE-HIRE RECOGNITION

The Contractors recognize the signatory Unions as the sole and exclusive bargaining representatives of all craft employees who are performing Project Work within the scope of Article 3 of this Agreement.

SECTION 4.2 UNION REFERRAL

A. The Contractors agree to hire craft employees for Project Work covered by this Agreement through the job referral systems and hiring halls established in the Local Unions' area collective bargaining agreements (attached as Schedule A to this Agreement), where those referrals meet the qualifications set forth in items 1, 2, and 4 of subparagraph B. The Unions agree to provide such craft employees (including apprentices) to all Contractors on a non-discriminatory basis. Notwithstanding this, Contractors shall have sole right to determine the competency of all referrals; the number of employees required; and the selection of employees for layoff (subject to Article 5, Section 5.3). In the event that a Local Union is unable to fill any request for qualified employees within a 48-hour period after such requisition is made by a Contractor (Saturdays, Sundays and holidays excepted), a Contractor may employ qualified applicants from any other available source. In the event that the Local Union does not have a job referral system, the Contractor shall give the Local Union first preference to refer applicants, subject to the other provisions of this Article. The Contractor shall notify the Local Union of craft employees hired for Project Work within its jurisdiction from any source other than referral by the Union. The Local Unions will cooperate with Contractor requests for minority, women, or economically disadvantaged referrals to meet the goals of Article 4, Section 4.4. These workers may be delivered under a "Direct Entry" designation or by use of a Department of Labor waiver.

B. A Contractor may request by name, and the Local Union will honor, referral of persons who have applied to the Local Union for Project Work and who meet the following qualifications:

(1) possess any license required by New York State law for the Project Work to be performed;
(2) Have worked a total of at least 1000 hours in the construction craft during the

prior two years, and

(3) Were on the Contractor's active payroll for at least 60 out of the 180 calendar days prior to the contract award.
(4) Have the ability to safely perform the basic functions of the applicable trade.
(5) Have not committed a felony or misdemeanor, or other violation that would render such person unfit to work on school district property.

C. Except as specifically addressed in (F) below, no more than twenty (20%) per centum of the employees covered by this Agreement, per Contractor by craft, shall be hired through the provisions of Paragraph B of this section (any fraction shall be rounded to the next highest whole number). Craft forepersons and/or general forepersons shall be included in these twenty (20%) percent. If requested by the appropriate Union, a Contractor utilizing this provision for by-name referrals shall furnish the Union with a written certification that the individuals requested for referral meet the requirements of (1) - (4) above.

D. The Local Unions shall exert their utmost efforts to recruit sufficient numbers of skilled craft workers to fulfill the manpower requirements of the Contractor. When a contractor of any tier is contracted to perform work on the project and such contractor is not signatory to a Schedule A agreement (not including signatory through this agreement) and the Union cannot provide ample labor to support the construction schedule or project. The contractor shall hire outside the union hiring halls and the contractor shall at their discretion replace the non-union or non-dispatched employee when notified by the union that labor has become available through the union. The contractor shall use other employees affiliated with the Council before hiring except, where specifically addressed in this agreement if those employees from the other unions have the required trade skills to perform the work. Those hired through this provision shall be laid off before those of an affiliated union.

E. Notwithstanding the foregoing, the NECSD shall have the sole discretion to request that a person be removed from working on this Project.

F. For work related to construction of the career tech education proprietary equipment as agreed upon by the parties, the contractor, installer or vendor shall hire one company or core employee through the special provisions and at the same time hire one employee hired through the respective union and after 2 employees no more than 33.3% of the employees covered by this Agreement, per Contractor by craft, shall be hired through the provisions of Paragraph B of this section (any fraction shall be rounded to the next highest whole number). Craft forepersons and/or general forepersons shall be included in this 33.3%. If requested by the appropriate Union, a Contractor utilizing this provision for by-name referrals shall furnish the Union with a written certification that individuals requested for referral meet the

requirement of (1) – (4) above.

SECTION 4.3 NON-DISCRIMINATION IN REFERRALS

The Local Unions represent that their hiring halls and referral systems shall be operated in a non-discriminatory manner and in full compliance with all applicable federal, state and local laws and regulations which require equal employment opportunities. Referrals shall not be affected in any way by the rules, regulations, bylaws, constitutional provisions or any other aspects or obligations of union membership, policies, or requirements and shall be subject to such other conditions as are established in this Article. No employment applicant shall be discriminated against by any referral system or hiring hall because of the applicant's union membership, or lack thereof.

SECTION 4.4 WORKFORCE DIVERSITY UTILIZATION

The Unions recognize and acknowledge that workforce diversity of minorities and women are employment goals consistent with our values of fair play. The Local Unions agree and will strive to utilize their best efforts to provide qualified minority and female applicants.

SECTION 4.5 CROSS AND QUALIFIED REFERRALS

The Local Unions shall not knowingly refer to a Contractor an employee then employed by another Contractor working under this Agreement. The Local Unions shall exert their utmost efforts to recruit sufficient numbers of skilled and qualified crafts employees to fulfill the requirements of the Contractor.

SECTION 4.6 UNION DUES

Nothing in this Agreement requires employees to join a union or pay dues or fees to a union as a condition of working on the covered project. This Agreement is not, however, intended to supersede independent requirements in applicable local union agreements as to contractors that are otherwise signatory to those agreements and as to employees of such employers performing covered work.

ARTICLE 5 – UNION REPRESENTATION

SECTION 5.1 LOCAL UNION REPRESENTATIVE

Each Local Union signatory to this Agreement shall be entitled to designate a representative and/or Business Manager who shall be afforded access to the Project site.

SECTION 5.2 STEWARDS

A. Each Local Union shall have the right to designate from among those referred to the Project a working journey person as a Steward or Lead Engineer and one alternate per shift, and shall notify the General Contractor of the identity of the designated Steward or Lead Engineer (and alternate) prior to the assumption of such duties. Stewards or Lead Engineer shall not exercise supervisory functions and shall receive the regular rate of pay for their craft classifications. There will be no non-working Stewards or Lead Engineer on the Project.

B. In addition to his/her work as an employee, the Steward or Lead Engineer shall have the right to receive complaints or grievances and to discuss and assist in their adjustment with the Contractor's appropriate supervisor; such activities, however, are not to interfere with the Steward's work unless an emergency situation exists. Each Steward or Lead Engineer shall be concerned with the employees of the Steward's Contractor and, if applicable, subcontractors of that Contractor, but not with the employees of any other Contractor. The Contractor will not discriminate against the Steward or Lead Engineer in the proper performance of Union duties.

SECTION 5.3 LAYOFF OF A STEWARD

Contractors agree to notify the appropriate Union 24 hours prior to the layoff of a

Steward or Lead Engineer, except in cases of discipline or discharge for just cause. If a Steward is protected against layoff by a Schedule A, such provisions shall be recognized to the extent the Steward or Lead Engineer possesses the necessary qualifications to perform the work required. In any case in which a Steward or Lead Engineer is discharged or disciplined for just cause, the Local Union involved shall be notified immediately by the Contractor.

SECTION 5.4 UNION STANDARDS

The Council and its affiliates have a legitimate interest in preventing the undermining of the work opportunities and standards gained through collective bargaining and desire to preserve and protect work opportunities for its members.

NECSD, while recognizing this interest, must maintain its ability to utilize the services of off-site fabricators and those entities involved in deliveries of construction materials when not covered under New York State Labor Law 220.

While the scope of the Agreement is limited to construction as defined, Contractors should whenever economically feasible make reasonable efforts to use union signatory vendors, which includes, but not limited to, UA Yellow Label and SMW Blue Label products for off-site assemblies or fabrications and deliveries of construction materials. The Construction Manager agrees to support efforts to retain as much work as possible.

This article does not refer to construction material normally purchased pre-assembled or manufactures, it references work normally and historically done on-site or in local union fabrications shops.

If any dispute should arise with respect to this Article, the Trades agree to install any off-site assemblies or fabricated items regardless of the source. The parties shall endeavor to settle such dispute in the Labor Management forum or appropriate sub-committee before a grievance is filed under Article 9.

ARTICLE 6 – MANAGEMENT RIGHTS

SECTION 6.1 RESERVATION OF RIGHTS

Except as expressly limited by a specific provision of this Agreement, Contractors retain full and exclusive authority for the management of their operations including, but not limited to: the right to direct the work force, including determination as to the number to be hired and the qualifications therefore; the promotion, transfer, layoff of its employees; or the discipline or discharge for just cause of its employees; the assignment and schedule of work; the promulgation of reasonable Project work rules; and the requirement, timing

and number of employees to be utilized for overtime work. Nothing contained herein shall be construed so as to allow direction of an Employee to perform work outside the jurisdiction of that Employee's Labor Union affiliation, if any. No rules, customs, or practices which limit or restrict productivity or efficiency of the individual (as determined by the Contractor) and/or joint working efforts with other employees shall be permitted or observed.

SECTION 6.2 MATERIALS, METHODS & EQUIPMENT

There shall be no limitation or restriction upon the Owner's choice of materials, techniques, methods, technology or design, or, regardless of source or location, upon the use and installation of equipment, machinery, package units, pre-cast, pre-fabricated, pre- finished, or pre-assembled materials, tools, or other labor-saving devices. Contractors may, without restriction, install or use materials, supplies or equipment regardless of their source. The on-site installation or application of such items shall be performed by the craft having jurisdiction over such work pursuant to an applicable collective bargaining agreement; provided, however, it is recognized that other personnel having special qualifications may participate, in a supervisory capacity, in the installation, check-off or testing of specialized or unusual equipment or facilities as designated by the Contractor.

ARTICLE 7 - WORK STOPPAGES AND LOCKOUTS

SECTION 7.1 NO STRIKES-NO LOCK OUT

There shall be no strikes, sympathy strikes, picketing, work stoppages, slowdowns, demonstrations or other disruptive activity on Project Work site for any reason by any signatory to this Agreement. There shall be no union or concerted or employee activity which disrupts or interferes with the Project Work. Should any employee breach this provision, the Unions will use their best efforts to immediately end the breach and return all employees to work. There shall be no lockout by any signatory to this Agreement.

SECTION 7.2 DISCHARGE FOR VIOLATION

A Contractor may discharge any employee violating Section 7.1, above, and any such employee will not be eligible thereafter for referral under this Agreement for a period of 100 working days.

SECTION 7.3 NOTIFICATION

If a Contractor contends that any Union has violated this Article, it shall notify the Council of such fact, with copies of the notification to the Local Union involved. The Council and Local Union shall instruct, order, and otherwise use their best efforts to cause

the employees to immediately cease and desist from any violation of this Article. The Council shall not be liable for the unauthorized acts of a Local Union or its members. Similarly, a Local Union and its members shall not be liable for any unauthorized acts of its members, the Council, or another Local Union.

SECTION 7.4 EXPEDITED ARBITRATION

Any Contractor or Union alleging a violation of Section 7.1 of this Article or Section 8.3(D)(ii) of Article 8 may utilize the expedited procedure set forth below (in lieu of, or in addition to, any actions at law or equity) that may be brought.

A. A party invoking this procedure shall notify J.J. Pierson, Neal M. Eiseman and Thomas Hines who shall alternate as Arbitrator under this expedited arbitration procedure. If the Arbitrator next on the list is not available to hear the matter within 24 hours of notice, the next
Arbitrator on the list shall be called. Copies of such notification will be simultaneously sent to all parties (the alleged violator, the Council, the Local Union, the Contractor, and the Owner).

B. The Arbitrator shall hold a hearing within 48 hours of receiving the notice invoking the procedure if it is contended that the violation still exists. The Arbitrator shall provide at least 24 hours' notice (excluding Sundays and holidays) to all parties as to time and place of the hearing.

C. All notices pursuant to this Article must be delivered to all parties (Local Union, Council, Contractor, alleged violator) and may be provided by telephone, telegraph, hand delivery, fax, email, or confirmed overnight delivery. The hearing may be held on any day including Saturdays or Sundays. The hearing shall be completed in one session which shall not exceed 8 hours duration (no more than 4 hours being allowed to either side to present their case and conduct their cross examination) unless otherwise agreed. A failure of any party to attend the hearing shall not delay the hearing of evidence by those present or the issuance of an award by the Arbitrator.

D. (i) Section 7.1 hearings:
The sole issue at the hearing shall be whether a violation of Section 7.1 occurred. If a violation is found to have occurred, the Arbitrator shall issue a Cease-and-Desist Award restraining such violation and serve copies on all parties. The Arbitrator shall have no authority to consider any matter in justification, explanation or mitigation of such violation or to award damages (any damages issue is reserved solely for court proceedings, if any). The Award shall be issued in writing within 3 hours after the close of the hearing, and may be issued without an Opinion. If any involved party desires an Opinion, one shall be issued within 15 calendar days, but its issuance shall not delay compliance with, or enforcement of, the Award.

(ii) Section 8.3(D)(ii) hearings:
The sole issue at the hearing shall be whether a violation of Section 8.3(D)(ii) occurred. If a violation is found to have occurred, it shall be prima facie evidence of intentional mis-assignment, and the Arbitrator shall issue an immediate stop-work order with respect to the work involved and reassign the work as necessary. The Arbitrator is also authorized to (a) award damages or back pay in order to make the aggrieved trade whole, and (b) remove the offending contractor from the job in egregious situations.

E. An Award issued under this procedure may be enforced by any court of competent jurisdiction upon the filing of this Agreement together with the Award. Notice of the filing of such enforcement proceedings shall be given to all parties. In any court proceeding to obtain a temporary or preliminary order enforcing the Arbitrator's Award as issued under this expedited procedure, the involved Union and Contractor waive their right to a hearing and agree that such proceeding may be commenced by order to show cause. Such agreement does not waive any party's right to participate in a hearing for a final court order of enforcement or in any contempt proceeding.

F. Any rights created by statute or law governing arbitration proceedings which are inconsistent with the procedure set forth in this Article, or which interfere with compliance thereto, are hereby waived by the Contractors and Unions to whom they accrue.

G. The fees and expenses of the Arbitrator shall be equally divided between the involved Contractor and Union.

SECTION 7.5 ARBITRATION OF DISCHARGES FOR VIOLATION

Procedures contained in Article 9 shall not be applicable to any alleged violation of this Article, with the single exception that an employee discharged for violation of Section 7.1, above, may have recourse to the procedures of Article 9 to determine only if the employee did, in fact, violate the provisions of Section 7.1 of this Article; but not for the purpose of modifying the discipline imposed where a violation is found to have occurred.

ARTICLE 8 – LABOR MANAGEMENT COMMITTEE

SECTION 8.1 SUBJECTS

The Project Labor Management Committee ("Committee") will meet on a regular basis to: 1) promote harmonious relations among the Contractors and Unions; 2) enhance safety awareness, cost effectiveness and productivity of construction operations; 3) protect the public interest; 4) discuss matters relating to staffing and scheduling with safety and productivity as considerations; and 5) review Affirmative Action and equal employment

opportunity matters pertaining to the Project, if any.

SECTION 8.2 COMPOSITION

The Committee shall be jointly chaired by a designee of the Owner and the Council. It may include representatives of the Local Unions and contractors involved in the issues being discussed. The Committee may conduct business through mutually agreed upon sub-committees.

SECTION 8.3 PRE-JOB CONFERENCE

(A) So that the start and continuation of work may progress without interruption, the Committee shall require each Contractor and Subcontractor of whatever tier to conduct a pre-job conference with the Council prior to commencing work. The Construction Manager and General Contractor shall be advised in advance of such conferences and may participate if they wish.

(B) The purpose of the pre-job conference shall be for the parties to gain an understanding of each Contractor's proposed work assignments, the standard work day and work week, the number of employees to be employed, the method of referral, the applicable wage rates and fringe benefit contributions and any other matters in accordance with this Agreement.

(C) Proposed Trade Assignments. In conjunction with the pre-job conference, each Contractor shall fill out the attached Schedule D – Proposed Trade Assignments identifying all subcontractors and indicating what trades will be used to perform the Project work. This form shall be submitted to the Council at least fourteen (14) days in advance of the commencement of work. If any Local Union(s) objects to or disagrees with the Proposed Trade Assignment of either the Contractor or subcontractor, the Local Union will state its objection and there shall be a good faith discussion among the Contractor or subcontractor and the objecting Local Union and other affected Unions to resolve the matter. If no resolution is reached, any involved Local Union may submit their position in writing, together with support documentation, within seven (7) calendar days to the Contractor or subcontractor with a copy to all affected Local Unions. The Contractor or subcontractor will review all submitted supporting documentation regarding the Proposed Trade Assignments and will submit to the General Contractor, the Council, and all affected Local Unions a "Final Trade Assignment" letter within fourteen (14) days calendar days of the pre-job meeting at which the Proposed Trade Assignments were made.

(D) Disputes and Violations.

(1) Unresolved disputes concerning trade assignments shall be handled in accordance with Section 10.1, 10.2, and 10.3 of Article 10 in accordance with the National Plan established by the Building and Construction Trades Department, provided however, that disputes concerning intra-trade assignments (assignments between trades within the same International Union) will be determined by the applicable International Union.

(2) Failure to conduct a pre-job conference, failure to include all required parties in a pre-job conference, or failure to adhere to agreed-upon Schedule D trade assignments is a violation of this Agreement and prima facie evidence of intentional mis-assignment. Alleged violations of this provision shall be considered a lock-out and subject to the expedited arbitration procedures of Article 7, Section 7.4.

(3) All remaining unresolved issues shall be subject to the provisions of Article 9.

ARTICLE 9 - GRIEVANCE & ARBITRATION PROCEDURE

SECTION 9.1 CLOSE COOPERATION

The Contractors, Unions, and employees, collectively and individually, realize the importance to all parties to maintain continuous and uninterrupted performance of Project Work and agree to resolve disputes in accordance with the grievance-arbitration provisions set forth in this Article.

SECTION 9.2 PROCEDURE

Any question, dispute or claim arising during the term of this Agreement involving the interpretation or application of this Agreement (other than jurisdictional disputes and alleged violations Section 7.1, and Section 8.3(D)(i) or (ii), shall be considered a grievance and shall be resolved pursuant to the following procedure.

Step 1:

(a). When any employee covered by this Agreement feels aggrieved by a claimed violation of this Agreement, the employee shall give notice of the claimed violation to the Local Union representative or job steward, who shall notify the work site representative of the involved Contractor and the

General Contractor. To be timely, such notice must be given within 7 calendar days after the act, occurrence or event giving rise to the grievance. The Local Union representative or the job steward shall meet with the work site representative of the involved Contractor and the General Contractor and endeavor to adjust the matter within 7 calendar days after timely notice has been given. The representative of the involved Contractor shall keep the minutes of the meeting and shall respond to the Union representative in writing, with copy to the General Contractor, within twenty-four (24) hours after the conclusion of the meeting. If they fail to resolve the matter within the prescribed period, the grieving party, may, within 7 calendar days thereafter, pursue Step 2 of the grievance procedure by serving the involved Contractor with written copies of the grievance setting forth a description of the claimed violation, the date on which the grievance occurred, and the provisions of the Agreement alleged to have been violated. Grievances and disputes settled at Step 1 are non-precedential except as to the specific Local Union, employee and Contractor directly involved unless the settlement is accepted in writing by the Labor-Management Committee as creating a precedent with respect to Project Work.

(b) Should any signatory to this Agreement have a dispute [excepting jurisdictional disputes and alleged violations of Section 7.1 or Section 8.3(D)(i) or (ii) with any other signatory to this Agreement and, if after conferring, a settlement is not reached within 7 calendar days, the dispute may be reduced to writing and the grieving party may proceed to Step 2 in the same manner as outlined in subparagraph (a) for the adjustment of employee grievances.

Step 2:

Upon timely receiving a written grievance, the involved Contractor shall notify and schedule a meeting with the Business Manager of the involved Local Union, the Council, and the General Contractor, and their respective representatives, for the purpose of arriving at a satisfactory settlement. Such meeting shall be held within 7 calendar days of the involved Contractor's receipt of the written grievance. Meeting minutes shall be kept by the Contractor with copies to the parties within twenty-four (24) hours.

Step 3:

(a) If the grievance shall have been submitted but not resolved in Step 2, any of the participating Step 2 entities may, within 21 calendar days after the initial Step 2 meeting, submit the grievance in writing (copies to other participants, including the General Contractor) along with copies of the minutes from Step 1 and Step 2, to (J.J. Pierson, Neal M. Eiseman and Thomas Hines) who shall act, alternately, as the Arbitrator under this procedure. The

Labor Arbitration Rules of the American Arbitration Association shall govern the conduct of the arbitration hearing, at which all Step 2 participants shall be parties. The decision of the Arbitrator shall be final and binding on the involved Contractor, Local Union, and employees, and the fees and expenses of such arbitrations shall be borne equally by the involved Contractor and Local Union.

(b) Failure of the grieving party to adhere to the time limits set forth in this Article shall render the grievance null and void. These time limits may be extended only by written consent of the General Contractor, the involved Contractor, and the involved Local Union at the particular step where the extension is agreed upon. The Arbitrator shall have authority to make decisions only on the issues presented to him and shall not have the authority to change, add to, delete or modify any provision of this Agreement.

ARTICLE 10 - JURISDICTIONAL DISPUTES

SECTION 10.1 ASSIGNMENT

The assignment of work shall be solely the responsibility of the Contractor performing the work involved, subject to the pre-job conference and the procedures set forth in Section 8.3(C), and such work assignments shall be in accordance with the National Plan for the Settlement of Jurisdictional Disputes in the Construction Industry ("National Plan") or any successor Plan approved by the Building & Construction Trades Department, AFL-CIO.

SECTION 10.2 PROCEDURE FOR SETTLEMENT OF JURISDICTIONAL DISPUTES

All jurisdictional disputes involving Project Work shall be settled according to the National Plan, provided however, that disputes concerning intra-trade assignments (assignments between trades within the same International Union) will be determined by the applicable International Union.

SECTION 10.3 NO DISRUPTIONS

There will be no strikes, work stoppages, or slowdowns, arising out of any jurisdictional dispute. Pending the resolution of the dispute, the work shall continue uninterrupted and as assigned by the Contractor. No jurisdictional dispute shall excuse a violation of Article 7.

SECTION 10.4 AWARD

Any jurisdictional award pursuant to this Article shall be final and binding on the

disputing Unions and the involved Contractor on this Project only, and may be enforced in

any court of competent jurisdiction. Such award or resolution shall not establish a precedent on any other construction work not covered by this Agreement.

SECTION 10.5 LIMITATIONS

. Awards made under this Article shall determine only to whom the disputed work belongs. The deciding person or group hereunder shall have no authority to (a) assign work to a double crew, that is, to more employees than the minimum required by the Contractor to perform the work involved; (b) assign the work to employees who are not qualified to perform the work involved; or (c) assign work being performed by non-union employees to union employees. This provision does not prohibit the establishment, with the agreement of the involved Contractor, of composite crews where more than one (1) employee is needed for the job.

ARTICLE 11 - WAGES AND BENEFITS

SECTION 11.1 CLASSIFICATION AND HOURLY RATE

All employees covered by this Agreement shall be classified in accordance with the work performed and paid the wage rates applicable for those classifications as required by the Schedule A applicable to the work. The term "straight time" in this Agreement shall mean the hourly wage rate applicable for those classifications as required by the applicable New York State Labor Law Section 220 ("Section 220") prevailing wage determination.

SECTION 11.2 EMPLOYEE BENEFITS

A. Unless expressly provided differently in this Agreement, Contractors agree to pay employee benefits/supplements on behalf of all of their employees covered by this Agreement in the amounts required by the applicable Section 220 schedule in effect. Except as provided herein, the Contractors agree that such payments shall be made to those established jointly trusteed employee benefit funds designated in Schedule A, and in the amounts so designated, to the extent such payments are required by and satisfy the Section 220 obligation. Bona fide jointly trusteed fringe benefit plans established or negotiated through collective bargaining during the life of this Agreement may be added if they similarly fall within Section 220. Contractors not otherwise contractually bound to do so shall not be required to contribute to non-Section 220 benefits, trusts or plans; however, this provision does not relieve Contractors signatory to local collective bargaining agreements with any Local Union from complying with the benefit requirements for all funds contained in those collective bargaining agreements.

B. Notwithstanding Section 11.2(A):

(1) Contractors who designate employees pursuant to Article 4, Section 4.2(B), may satisfy the above benefits obligation with respect to those employees by: (1) providing those employees with coverage under their private benefit plans for health, welfare, pension, annuity and 401(k); or (2) paying the full amount of such benefit to the employee in employees' wages. The total benefit payments to be made on behalf of each such employee must equal the total Section 220 benefit/supplement amount. If the Contractor's contribution into the private benefit plan for the above funds is less than the amount required by Section 220, the difference must be paid to the employee in cash. Payments of other benefits covered under Section 220 shall be paid to the respective Unions on behalf of employee

(2) This same option shall apply with respect to any other employee who is referred to the Contractor through the hiring hall process provided such employee was previously employed by the Contractor and was a participant in a bona fide private benefit plan maintained by the Contractor which satisfies the requirements of Section 220.

(3) The option for a private plan equivalent supplement shall not apply to contributions into Joint Apprentice Training Committee (JATC) or similar apprentice funds designated in Schedule A if the Contractor does not have an apprentice training program approved by the Department of Labor. Upon request by the Council, any contractor providing coverage under this provision will provide the Council with documentation of benefit payments made to individual employees during the term of their employment on the Project.

(4) Contractors who exercise the option under Section 11.2(B) of this Article to pay into their own private benefit plans rather than the applicable jointly trusteed funds designated in Schedule A shall be responsible for and guarantee employee benefit/supplement payments and shall indemnify and hold harmless the jointly trusteed funds designated in Schedule A against any and all benefit/supplement claims by its employees.

C. Contractors who contribute to jointly trusteed funds under this Section agree to be bound by the written terms of the legally-established jointly trusteed Trust agreements specifying the detailed basis on which payments are to be paid into, and benefits paid out of, such trust funds but only with regard to work done on this Project and only for those employees for whom this Agreement requires such benefit Payments. Notwithstanding the foregoing, a Contractor's liability shall be at all times limited to the amount of contributions required to be made to the Trust Funds.

D. Each Contractor shall be responsible for and guarantee the payment of all required fringe benefits on the Project. The Local Unions and/or the Council shall notify the General Contractor and the Construction Manager within 120 hours excluding weekends whenever a Contractor or Subcontractor, including the General Contractor, fails to make a required benefit payment and such delinquency remains outstanding after 30 days. Notification must be in writing and may be by email. If written notice of such a delinquency is received by the General Contractor within that 48-hour period, the General Contractor shall notify the Construction Manager immediately, but in any case, within 24 hours. If the Construction Manager receives notice of a delinquency by the General Contractor, it shall withhold from any funds due to the delinquent Contractor the amount of that delinquency, up to the total amount due, until any dispute regarding the delinquency has been resolved. The General Contractor shall have no other obligation with respect to contributions owed by any Contractor (or its Subcontractor); but the General Contractor shall continue to be obligated with respect to contributions based on work done by the General Contractor. If notice of a delinquency is not received by the Construction Manager within the required time periods, Owner shall have no basis upon which to withhold, with respect to that delinquency, any part of a payment which is otherwise due. Construction Manager shall require contractors to submit proof of benefit payment with pay request.

ARTICLE 12 - HOURS OF WORK, PREMIUM PAYMENTS, SHIFTS AND HOLIDAYS

SECTION 12.1 WORK WEEK AND WORK DAY

A. Unless otherwise provided for in this Agreement, the standard work week shall be five days, Monday through Friday, eight hours per day plus ½ hour unpaid lunch period each day. The starting time for the standard work week shall start at either 6:00 a.m., 6:30 a.m., 7:00 a.m., 7:30 a.m. or 8:00 a.m. Multiple starting times shall be allowed.

B. Four-tens: notwithstanding any other provision of the Agreement, when working a four-day work week, the work shall consist of 4 days, Monday through Thursday, ten hours per day plus ½ hour unpaid lunch period at the straight time rate. The starting time for four-tens shall be 6:00 a.m. 6:30 a.m. 7:00 a.m. A three-day minimal notice shall be required for four-tens to the respective involved unions.

C. On a 5-day work week, Saturday may be used as a make-up day at straight time to fulfill the 40-hour work week due to inclement weather. On a 4-day work week, Friday maybe used as a make-up day at straight time to fulfill the 40-hour work week. Make-up days shall be scheduled for a minimum of 8 hours, except in the case of inclement weather in which Section 12.5 shall apply. Make-up days shall not be mandatory and no discipline shall be taken against employees electing not to work the make-up day. This shall also apply when more than one shift or multiple shifts are worked.

D. The changing of the regular starting time, except in the case of overtime and the switch from a 5- day and 4-day work weeks shall be a 4-week minimum.

SECTION 12.2 OVERTIME

Overtime pay for hours outside of the standard work week and work day, defined in Section 12.1, and all work on Saturdays shall be paid at time and one half the hourly rate and benefits will be paid on straight time. All work on Sundays shall be paid at two times the hourly rate and benefits will be paid at straight time.

SECTION 12.3 SHIFTS

A. Flexible Schedules - Scheduling of shift work, including Saturday and Sunday work, shall be within the discretion of the Contractor in order to meet Project Work schedules and existing Project Work conditions. Shifts must have prior approval of the General Contractor and/or Owner and must be scheduled with not less than three work days' notice to the Local Union.

B. Second and/or Third Shifts -- Saturday and/or Sunday Work.
The second shift shall start between 3 p.m. and 6 p.m. and the third shift shall start between 11 p.m. and 2 a.m. Shift differentials shall be straight time plus fifty percent (50%) of the Schedule A shift differential. No other premium or payments for such work shall be required unless such work is in excess of 40 hours during the week. There shall be no reduction in hours worked on a second and/or third shift, except that when 3 shifts are working together, the length of one or more shifts can be reduced to accommodate a 24-hour day and only actual hours worked will be paid. Work performed on Saturdays or Sundays shall be paid as provided in the applicable Schedule A.

C. To clarify above: "Schedule A Shift Differential designated percentage rates vary according to each trade's prevailing Collective Bargaining Agreement. Shift work as part of this Project Labor Agreement is 50% of the designated percentage of the shift percentages of each trades, for example if a trades shift differential is 15% it would be 7.5%."

SECTION 12.4 HOLIDAYS

A. Schedule - There shall be seven (7) recognized holidays:

New Year's Day
President's Day
Memorial Day
Fourth of July
Labor Day
Thanksgiving Day
Christmas Day

All said holidays shall be observed on the dates designated by New York State Law. In the absence of such designation, they shall be observed on the calendar date, except that holidays which occur on Sunday shall be observed on the following Monday.

B. Payment - Regular holiday pay, if any, for work performed on a recognized holiday shall be in accordance with the applicable Schedule A. There will be no benefits paid on holidays unless worked.

C. Exclusivity - No holidays other than those listed in Section 12.4 shall be recognized or observed.

SECTION 12.5 REPORTING PAY

A. Employees who report to the work location pursuant to a regular schedule and who are not provided with work or whose work is terminated early by a Contractor, for whatever reason, shall receive two (2) hours reporting pay and actual hours worked thereafter

B. When an employee who has completed his or her scheduled shift and has left the Project site is "called out" to perform special work of a casual, incidental, or irregular nature, the employee shall receive pay for actual hours worked at applicable straight time or overtime rates in accordance with this Agreement, but no less than a minimum guarantee of one (1) hour at the employee's straight time rate.

C. When an employee leaves the job or work location of their own volition, is discharged for cause, or is not working as a result of the Contractor's invocation of Section 12.8 below, he or she shall be paid only for the actual time worked.

D. There shall be no pay for time not actually worked except as specifically set forth in this Article 12 and where an applicable Schedule A applies to Forepersons, Stewards and Lead Engineer in reference to pay.

SECTION 12.6 PAYMENT OF WAGES

A. Payday: Payment shall be made by check, drawn on a New York bank with branches located within commuting distance of the job site. Paychecks shall be issued by the Contractor at the job site by 3:00 p.m. on Thursdays. In the event that the following Friday is a bank holiday, paychecks shall be issued on Wednesday of that week. Not more than one week's wages shall be held back in any pay period. Paycheck stubs shall contain the name and business address of the Contractor, together with an itemization of deductions from gross wages.

B. Termination: Employees who are laid off or discharged for cause shall be paid in full for that which is due them at the time of termination. The Contractor shall also provide the employee with a written statement setting forth the date of layoff or discharge.

SECTION 12.7 INJURY/DISABILITY

An employee who, after commencing work, suffers a work-related injury or disability while performing work duties, shall receive no less than eight (8) hours wages for that day. Further, the employee shall be rehired at such time as the employee is able to return to duties provided there is still work available on the Project for which the employee is qualified and able to perform.

SECTION 12.8 EMERGENCY WORK SUSPENSION

A Contractor may, if considered necessary for the protection of life, property, and/or safety of employees or others, suspend all or a portion of Project Work. In such instances, employees shall be paid for actual time worked; provided however, that when a Contractor requests that employees remain at the job site available for work, employees shall be paid for "stand-by" time at their hourly rate of pay.

ARTICLE 13 - APPRENTICESHIP & HELMETS TO HARDHATS

SECTION 13.1 APPRENTICE RATIOS

Recognizing the need to maintain continuing supportive programs designed to develop adequate numbers of competent workers in the construction industry and to provide craft entry opportunities for minorities, women and economically disadvantaged non-minority males, Contractors will employ apprentices in their respective crafts to perform such work as is within their capabilities and that is customarily performed by the craft in which they are indentured. Contractors may utilize apprentices and such other appropriate classifications as are contained in the applicable Schedule A in a ratio of not less than twenty-five percent (25%) of the work force by craft (without regard to whether a lesser ratio is set forth in Schedule A), unless the applicable Schedule A provides for a higher percentage. The first person assigned to the job shall be a Journeyman. The second person assigned may be an apprentice. Subsequent assignments shall be Journeymen until the applicable ratio is achieved. This assignment shall be repeated until staffing needs are satisfied. Apprentices and such other classifications as are appropriate will be employed in a manner consistent with the provisions of the applicable Schedule A.

SECTION 13.2 NYS DEPARTMENT OF LABOR- APPRENTICESHIP

To assist the Contractors in attaining a maximum effort on this Project, the Unions agree to work in close cooperation with, and accept monitoring by, the New York State Department of Labor to ensure that minorities and women are afforded every opportunity to participate in apprenticeship programs that result in the placement of apprentices on this Project. In addition, up to fifty percent (50%) of the apprentices placed on this Project may be first year, minority, women or economically disadvantaged apprentices. The Local Unions will cooperate with Contractor requests for minority, women, or economically disadvantaged referrals to meet this Contractor effort. These workers may be delivered under a "Direct Entry" designation or by use of a Department of Labor Waiver.

SECTION 13.3 HELMETS TO HARDHATS

The Contractors and the Unions desire to facilitate the entry into the building and construction trades of veterans who are interested in careers in the building and construction industry. The Contractors and the Unions agree to utilize the services of the Center for Military Recruitment, Assessment and Veterans Employment (the "Center") and the Center's "Helmets to Hardhats" program as a resource for preliminary orientation and assessment of construction aptitude; referral to apprenticeship programs or hiring halls; counseling and mentoring; and support networks, employment opportunities, and other needs as identified by the parties.

The Unions and the Contractors agree to work with the Center to create and maintain an integrated database of veterans interested in working on the Project as well as information about apprenticeship and employment opportunities related to this Project. To the extent permitted by law, the Unions will give credit to such veterans for bona fide, provable past experience.

SECTION 13.4 PARTICIPATION GOALS (MBE, WBE, SVDOB)

The Newburgh School District, contractors, the Hudson Valley Building and Construction Trades Council and its affiliated unions are committed to meeting the NYS Participation Goals and shall be in alignment with the current goal or standards set for by New York State for Minority Business Enterprises (MBE), Woman Owned Business Enterprise (WBE) and Service-Disabled Veteran Owned Business (SVDOB) to ensure participation on the project by MBE, WBE and SVDOB firms while maintaining fiscal responsibility.

Outreach by the construction managers, contractors, Hudson Valley Building and Construction Trades and affiliated unions and contractor associations to ensure participation goals of MBE, WBE and SVDOB firms are met will be required through the project.

ARTICLE 14 – NO DISCRIMINATION

SECTION 14.1 COOPERATIVE EFFORTS

The Contractors and Unions agree that they shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, marital status, age, union or non-union status, real or perceived sexual orientation or any other status protected by law, in any manner prohibited by law or regulation. It is recognized that special procedures may be established by Contractors and Local Unions and the New York State Department of Labor for the training and employment of persons who have not previously qualified to be employed on construction projects of the type covered by this Agreement. The parties to this Agreement shall assist in such programs and agree to use their best efforts to ensure that the goals for female and minority employment are met on this Project. Nothing in this section shall be grieveable.

SECTION 14.2 LANGUAGE OF AGREEMENT

The use of the masculine or feminine gender in this Agreement shall be construed as including both genders.

ARTICLE 15– GENERAL TERMS

SECTION 15.1 PROJECT RULES

The Construction Manager, General Contractor and/or other Contractors may establish from time to time such reasonable Project rules as are necessary for the good order of the Project. These rules shall be outlined at the pre-job conference, detailed in the contract documents, posted at the Project site, and may be amended thereafter as necessary.

Security Protocols – The Construction Manager and/or NECSD, in their sole discretion, will determine security protocols for the entire Project Site. Strict compliance by all employees with security procedures, protocols, and directives issued by these entities or its delegated, is required by all employees at all times.

SECTION 15.2 TOOLS OF THE TRADE

The welding/cutting torch and chain fall are tools of the trade having jurisdiction over the work performed. Employees using these tools shall perform any of the work of the trade. There shall be no restrictions on the emergency use of any tools or equipment by any qualified employee or on the use of any tools or equipment for the performance of work within the employee's jurisdiction.

SECTION 15.3 SUPERVISION

Employees shall work under the supervision of the craft foreperson or general foreperson.

SECTION 15.4 FULL WORKDAY

Employees shall be at their work area at the starting time established by the Contractor. The signatories reaffirm their policy of a fair day's work for a fair day's wage.

SECTION 15.5 CAREER AND TECHNICAL EDUCATION ("CTE")

With the exception of work already excluded under this Agreement, the parties to this Agreement agree to meet for the purpose of determining which proprietary equipment in the Career and Technical Education ("CTE") Building will be included or excluded under the Project Labor Agreement. This equipment includes, but is not limited to, the equipment in the café, culinary room, auto, makers spaces, photo/art, nursing and EMS, cosmetology/barbershop, architecture/engineering and carpentry/machinery rooms. The parties shall meet upon finalization of plans & specifications for the "CTE" Building and in advance of advertisement of bids related to the "CTE" Building.

ARTICLE 16 - SAFETY PROTECTION OF PERSON AND PROPERTY

SECTION 16.1 SAFETY REQUIREMENTS

Each Contractor will ensure that applicable OSHA and New York State mandated safety requirements are at all times maintained on the Project and the employees and Unions agree to cooperate fully with these efforts. Employees must perform their work at all times in a safe manner and protect themselves and the property of the Contractor and NECSD from injury or harm. Failure to do so may be grounds for discipline, including discharge. Prevention of accidents at the site is the responsibility of the Contractors, its employees, subcontractors and suppliers, persons, and entities at the site. The Contractors shall establish their own safety programs implementing safety measures, policies, and standards conforming to those required or recommended by governmental and quasi-governmental authorities having jurisdiction. The Construction Manager is not responsible for identifying unsafe practices,
nor for failure to stop the Contractors' unsafe practices; and, the Construction Manger's failure to stop the Contractors' unsafe practices shall not relieve the Contractors of the responsibility therefore.

SECTION 16.2 CONTRACTOR RULES

Employees covered by this Agreement shall at all times be bound by the reasonable safety, security, and visitor rules as established by the Owner. Such rules will be published in the contract documents and may be posted in conspicuous places throughout the Project.

SECTION 16.3 INSPECTIONS

The Contractors and NECSD's Architect and Construction Manager retain the right

to inspect incoming shipments of equipment, apparatus, machinery, and construction materials of every kind.

ARTICLE 17 – TEMPORARY SERVICES

Temporary light, power, cooling, ventilation and other services shall only be required on the specific request of the Contractor and when requested shall be assigned to the appropriate trade with jurisdiction. Temporary coverage may be provided by the Contractor's employees already working under this Agreement during regular work hours. The Contractor will determine the need for temporary coverage requirements during non-work hours. For safety reasons, temporary light and power panels will only be accessed by employees of the electrical contractor responsible for supplying the temporary light and power panels. This shall not require a standby employee who is not performing Project Work. There shall be no stacking of trades on temporary services. In the event temporary services are claimed by multiple trades, the matter shall be resolved pursuant to Article 10.

ARTICLE 18 - SAVINGS AND SEPARABILITY

SECTION 18.1 THIS AGREEMENT

In the event that the application of any provision of this Agreement is enjoined, on either an interlocutory or permanent basis, or is otherwise determined to be in violation of law, the provision involved (and/or its application to a particular part of the Project, as necessary) shall be rendered, temporarily or permanently, null and void, but the remainder of the Agreement shall remain in full force and effect to the extent allowed by law. In the event a court of competent jurisdiction finds any portion of the Agreement to be invalid, the parties will immediately enter into negotiations concerning the substance affected by such decision for the purpose of achieving conformity with the court determination and the intent of the parties hereto for contracts to be let in the future.

SECTION 18.2 NON-WAIVER

Nothing in this Agreement is intended to be or shall be construed as a waiver by any Union(s) of any prevailing wage determination or schedule that is applicable to their trade for any public work that has been or may be performed in the future on any work outside the scope of this Agreement. Nothing contained in this Agreement is intended to be or shall be construed as a waiver by any Union(s) of any more favorable term or condition of employment that may be contained in any collective bargaining agreement applicable to work outside the scope of this Agreement.

ARTICLE 19 - FUTURE CHANGES IN SCHEDULE A AREA CONTRACTS

SECTION 19.1 CHANGES TO AREA CONTRACTS

Each Schedule A attached to this Agreement shall continue in full force and effect until the Contractor and/or Union parties to the area collective bargaining agreements which are the basis for the Schedule A notify the Owner and General Contractor in writing of the agreed upon changes in those agreements which are applicable to the Project, and their effective dates. Such changes shall only be effective to the extent consistent with this Agreement. Any disagreement between signatories to this Agreement over the incorporation into Schedule A of provisions agreed upon in the renegotiation of area collective bargaining agreements shall be resolved in accordance with the procedure set forth in Article 9 of this Agreement.

SECTION 19.2 LABOR DISPUTES DURING AREA CONTRACT NEGOTIATIONS

The Unions agree that there shall be no strikes, work stoppages, sympathy actions, picketing, slowdowns or other disruptive activity or other violations of Article 7 affecting the Project by any Local Union involved in the renegotiation of area local collective bargaining agreements, nor shall there be any lock-out on this Project affecting a Local Union during the course of such renegotiations.

ARTICLE 20 - WORKERS' COMPENSATION ADR

At the written option of the Contractor and with the written approval of the Hudson Valley Building Trades Council, all Local Unions, Contractors and sub-contractors working on this Project agree to be bound by the Collectively Bargained Workers Compensation Alternative Dispute Resolution Agreement (ADR Agreement) and to the ADR program set forth therein, by and between the Construction Industry Council of Westchester and the Hudson Valley, Inc., and the Building and Construction Trades Council of Westchester and Putnam County, New York, entered into on January 26, 2007, as amended

ARTICLE 21-HUDSON VALLEY BUILDING AND CONSTRUCTION TRADES LABOR MANAGEMENT ALLIANCE

If not prohibited by law and there are no direct or additional costs to the Owner or Contractors, parties to this Agreement agree to participate in the Hudson Valley Building and Construction Trades Labor Management Alliance.

IN WITNESS WHEREOF the parties have caused this Agreement to be executed and effective as of the 1st day of February 2021.

FOR THE HUDSON VALLEY BUILDING AND CONSTRUCTION TRADES COUNCIL:

By: _____
L. Todd Diorio, President

FOR THE PALOMBO GROUP
BY: _____
(Name/Title) Luis H. Rodriguez, President

FOR NEWBURGH ENLARGED CITY SCHOOL DISTRICT:

BY: _____
(Name/Title) ROGER RAMOS / BOE APPOINTED OWNERS REPRESENTATIVE

FOR THE LOCAL UNIONS:

INTERNATIONAL BROTHERHOOD OF BOILERMAKERS, IRON SHIP BUILDERS, BLACKSMITHS, FORGERS & HELPERS, DISTRICT NO. 5

BY: _____
(Name/Title)

_____ _____
E-mail Office No. or Cell

THE INTERNATIONAL UNION OF BRICKLAYERS AND ALLIED CRAFTWORKERS LOCAL 1 BY: David D. Williams
(Name/Title)

DWilliams@BACINY.com 845.565.8544
E-mail Office No. or Cell

NORTH ATLANTIC STATES REGIONAL COUNCIL OF CARPENTERS LU# 279

BY: Martin J. Ross
(Name/Title)

mross@nasrcc.org 845-763-2456
E-mail Office No. or Cell

INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS LOCAL NO.363 BY: Sam Fuller BY HGR.
(Name/Title)

SFULLER@IBEW363.ORG 845-216-7023
E-mail Office No. or Cell

INTERNATIONAL ASSOCIATION OF HEAT AND FROST INSULATORS AND ALLIED WORKERS LOCAL #91

BY: T. J. Lee Business Manager
(Name/Title)

awl91@insulators.org (914) 788-0500
E-mail Office No. or Cell

FOR THE LOCAL UNIONS:

INTERNATIONAL BROTHERHOOD OF BOILERMAKERS, IRON SHIP BUILDERS, BLACKSMITHS, FORGERS & HELPERS, DISTRICT NO. 5

BY: _____ BM/ST
(Name/Title)

boilermakers1000/5@verizon.net — 516-326-2500
E-mail — Office No. or Cell

THE INTERNATIONAL UNION OF BRICKLAYERS AND ALLIED CRAFTWORKERS LOCAL 1 BY: _____
(Name/Title)

DWILLIAMS@BACINY.com — 845-565-8344
E-mail — Office No. or Cell

NORTH ATLANTIC STATES REGIONAL COUNCIL OF CARPENTERS LU# 279

BY: _____
(Name/Title)

mross@nasrcc.org — 845-763-2456
E-mail — Office No. or Cell

INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS LOCAL NO.363 BY: _____ BUS MGR.
(Name/Title)

SPRATTO@IBEWLU363.ORG — 845-216-7023
E-mail — Office No. or Cell

INTERNATIONAL ASSOCIATION OF HEAT AND FROST INSULATORS AND ALLIED WORKERS LOCAL #91

BY: _____
(Name/Title)

_____ — _____
E-mail — Office No. or Cell

INTERNATIONAL ASSOCIATION OF BRIDGE, STRUCTURAL, ORNAMENTAL AND REINFORCING IRON WORKERS LOCAL NO. 417

BY: Michael P. Snyder
(Name/Title)

gator417@verizon.net
E-mail

914-443-4991
Office No. or Cell

LABORERS' INTERNATIONAL UNION OF N.A. LOCAL 17

BY: R. Tedesco Bu

(Name/Title)

Tdiorio555@AOL.com
E-mail

914 474 6222
Office No. or Cell

INTERNATIONAL UNION OF OPERATING ENGINEERS, LOCAL 825

BY: C Wood

(Name/Title)
CWood@iuoe825.org
E-mail

908-347-0502
Office No. or Cell

DISTRICT COUNCIL NO. 9, INTERNATIONAL UNION OF PAINTERS AND ALLIED TRADES,
A.F.L. - C.I.O

BY: Business Rep
(Name/Title)
Skzdc9@Aol.com
E-mail

914-260-1807
Office No. or Cell

PLUMBERS, STEAMFITTERS AND SERVICE TECHNICIANS LOCAL UNION 373

BY: Robert Ambrosetti
(Name/Title)

RA373@AOL.com
E-mail

845-656-8091
Office No. or Cell

INTERNATIONAL ASSOCIATION OF SHEET METAL, AIR, RAIL AND TRANSPORTATION WORKERS (SMART) LOCAL 38

BY: _____
(Name/Title)

unionofficesmart38.org _____ 845-278-6868
E-mail Office No. or Cell

ROAD SPRINKLER FITTERS LOCAL UNION 669

BY: _____
(Name/Title)

_____ _____
E-mail Office No. or Cell

TEAMSTERS UNION LOCAL 445

BY: _____ John Clineman
(Name/Title)

jclineman@Teamsters union 445 org _____ 845-857-4353
E-mail Office No. or Cell

INTERNATIONAL UNION OF ELEVATOR CONSTRUCTORS

BY: _____ B.R. IUEC 17
(Name/Title)

IUEC138@aol.com _____ 845-332-5380
E-mail Office No. or Cell

NEW YORK CITY DISTRICT COUNCIL OF CARPENTERS LOCAL 740 Millwright 2257 Floorcovers

BY: _____ Vice President
(Name/Title)

MCAUANAUGH@NYCDISTRICTCOUNCIL.org _____ 212-366-7438
E-mail Office No. or Cell

INTERNATIONAL ASSOCIATION OF SHEET METAL, AIR, RAIL AND TRANSPORTATION WORKERS (SMART) LOCAL 38

BY:_____
(Name/Title)

E-mail

Office No. or Cell

ROAD SPRINKLER FITTERS LOCAL UNION 669

BY: Kenneth Kelly Business Agent
(Name/Title)

Klilley669@gmail.com
E-mail

914-475-9158
Office No. or Cell

TEAMSTERS UNION LOCAL 445

BY:_____
(Name/Title)

E-mail

Office No. or Cell

INTERNATIONAL UNION OF ELEVATOR CONSTRUCTORS

BY:_____
(Name/Title)

E-mail

Office No. or Cell

NEW YORK CITY DISTRICT COUNCIL OF CARPENTERS LOCAL 740

BY:_____
(Name/Title)

E-mail

Office No. or Cell

BRICKLAYERS AND ALLIED CRAFTS, TILE, MARBLE & TERAZZO UNION OF NEW YORK AND NEW JERSEY, LOCAL NO. 7

BY: Robert Virga BA.
(Name/Title)

SVIRGA@BACLOCAL7.COM
E-mail

917-734-7429
Office No. or Cell

UNITED UNION OF ROOFERS, WATERPROOFERS AND ALLIED WORKERS LOCAL NO. 8

BY: Bill Wilmer B.A.
(Name/Title)

WWILMER@ROOFERS8.ORG
E-mail

646 294 1510
Office No. or Cell

SCHEDULE A – LOCAL COLLECTIVE BARGAINING AGREEMENTS

ARTICLES OF AGREEMENT between the INTERNATIONAL BROTHERHOOD OF BOILERMAKERS, IRON SHIP BUILDERS, BLACKSMITHS, FORGERS & HELPERS, AFL-CIO and THE FIRMS WHOSE SIGNATURES ARE AFFIXED HERETO January 1, 2018 -December 31,2020

AGREEMENT by and between THE CONSTRUCTION CONTRACTORS ASSOCIATION OF THE HUDSON VALLEY, BUILDING CONTRACTORS ASSOCIATION, AND THE MASON AND CONCRETE CONTRACTORS ASSOCIATION OF THE HUDSON VALLEY and THE INTERNATIONAL UNION OF BRICKLAYERS AND ALLIED CRAFTWORKERS LOCAL 1 NEW YORK June 1, 2017 - May 31,2020

AGREEMENT between THE ASSOCIATIONS and the NORTH ATLANTIC STATE REGIONAL CONCIL OF CARPENTERS LOCAL UNION 279 May 1, 2019 -April 30, 2022

AGREEMENT by and between the HUDSON VALLEY CHAPTER, NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION and LOCAL UNION 363, INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS April 1, 2018 - March 31, 2022

AGREEMENT by and between the NATIONAL ELEVATOR BARGAINING ASSOCIATION and the INTERNATIONAL UNION OF ELEVATOR CONSTRUCTORS July 9, 2017 -July 8, 2022

MEMORANDUM OF AGREEMENT by and between the WINDOW AND PLATE GLASS DEALERS ASSOCIATION and DISTRICT COUNCIL NO. 9 GLAXIERS LOCAL UNION #1087 May 1, 2017-April 30, 2023

AGREEMENT OF WORKING CONDITIONS between INDUSTRIAL INSULATION CONTRACTORS OF SOUTHERN NEW YORK and THE INTERNATIONAL ASSOCIATION OF HEAT AND FROST INSULATORS AND ALLIED WORKERS LOCAL #91 May 30, 2016 - May 26, 2019

AGREEMENT between FABRICATORS, ERECTORS AND REINFORCING CONTRACTORS ASSOCIATION OF THE HUDSON VALLEY, INC. and LOCAL UNION NO. 417 OF THE INTERNATIONAL ASSOCIATION OF BRIDGE, STRUCTURAL, ORNAMENTAL AND REINFORCING IRON WORKERS July 1, 2018-June 30, 2021

INDEPENDENT MILLWRIGHT AGREEMENT between NEW YORK CITY MILLWRIGHT CONTRACTORS ASSOCIATION and THE DISTRICT COUNCIL OF NEW YORK CITY AND VICINITY OF THE UNITED BROTHERHOOD OF CARPENTERS AND JOINERS OF AMERICA and MILLWRIGHT LOCAL 740 July 1, 2011 -June 30, 2017

AGREEMENT between MASTER PAINTERS and DISTRICT COUNCIL NO. 9 May 1, 2014 -April 30,2020

RESILIENT FLOOR COVERERS AGREEMENT between THE GREATER NEW YORK FLOOR COVERERS ASSOCIATION, INC. and THE DISTRICT COUNCIL OF NEW YORK AND VICINITY OF THE UNITED BROTHERHOOD OF CARPENTERS AND JOINERS OF AMERICA September 16, 2016 - June 30, 2024

AGREEMENT between UNITED UNION OF ROOFERS, WATERPROOFERS AND ALLIED WORKERS, LOCAL UNION NO. 8 and ROOFING & WATERPROOFING CONTRACTORS ASSOCIATION OF NEW YORK AND VICINITY July 1, 2019 -April 30, 2022

COMMERCIAL AGREEMENT between LOCAL UNION NO. 38 OF THE INTERNATIONAL ASSOCIATION OF SHEET METAL, AIR, RAIL AND TRANSPORTATION WORKERS (SMART) and SHEET METAL AND ROOFING CONTRACTORS' ASSOCIATION OF SOUTHEASTERN NEW YORK May 1, 2019-April 30, 2024

AGREEMENT between NATIONAL FIRE SPRINKLER ASSOCIATION, INC. and ROAD SPRINKLER FITTERS LOCAL UNION NO. 669 April 1, 2016-March 31, 2021

AGREEMENT HEAVY & HIGHWAY between TEAMSTERS UNION LOCAL 445, IBT, AFL-CIO and INDIVIDUAL EMPLOYERS May 1, 2017 -April 30, 2020

LOCAL UNION NO. 7 TILE, MARBLE, AND TERRAZZO, AFL-CIO OF NEW YORK AND NEW JERSEY AGREEMENT between the MARBLE INDUSTRY OF NEW YORK, INC. and THE MARBLE POLISHERS AND MAINTENANCE FINISHERS, LOCAL NO. 7 of the INTERNATIONAL UNION OF BRICKLAYERS AND ALLIED CRAFTSMEN July 1, 2018-June 30, 2022

AGREEMENT HEAVY & HIGHWAY between TEAMSTERS UNION LOCAL 445, IBT, AFL-CIO and INDIVIDUAL EMPLOYERS May 1, 2017 -April 30, 2020

AGREEMENT between THE GREATER NEW YORK AND NEW JERSEY TILE CONTRACTORS ASSOCIATION, INC. and THE TILE SETTERS AND TILE FINISHERS UNION OF NEW YORK AND NEW JERSEY, LOCAL UNION NO. 7 OF THE INTERNATIONAL UNIO OF BRICKLAYERS AND ALLIED CRAFTWORKERS June 2, 2017 -June 2, 2021

AGREEMENT between the MOSAIC, TERRAZZO AND CHEMICAL PRODUCT DECORATIVE FINISHER MASONS WORKERS ASSOCIATION LOCAL NO. 7 OF NEW YORK NEW JERSEY & VICINITY INTERNATIONAL UNION OF BRICKLAYERS AND ALLIED CRAFTWORKERS and MARBLE TERRAZZO AND SPECIALTY CONTRACTORS ASSOCIATION, INC. July 1, 2017-June 30,2022

BUILDING AGREEMENT between LABORERS' LOCAL UNION NO. 17 and CONSTRUCTION CONTRACTORS ASSOCIATION of the HUDSON VALLEY, INC. June 1, 2017 - May 31, 2020

HEAVY, HIGHWAY & SITE AGREEMENT between LABORERS' LOCAL UNION NO. 17, AGC OF AMERICA and CONSTRUCTION INDUSTRY COUNCIL May 1, 2017 – April 30, 2020

MECHANICAL CONTRACTORS ASSOCIATION OF ROCKLAND, ORANGE, SULLIVAN COUNTIES and PLUMBERS & STEAMFITTERS LOCAL NO. 373 May 2019 – April 2021

AGREEMENT between INTERNATIONAL UNION OF NORTH AMERICA OPERATING ENGINEERS LOCAL UNION NO. 825 INDEPENDENT AGREEMENT July 1, 2019

SCHEDULE A COLLECTIVE BARGAINING AGREEMENT can be viewed by visiting the Hudson Valley Building and Construction Trades Council website: builditunion.org
Username: hudsonvalley
Password: buildingtrades

IT SHALL BE THE REPSONSIBILITY OF THE CONTRACTOR TO VERIFY SCHEDULE A AGREEMENTS WITH THE RESPECTIVE UNIONS SIGNATORY TO THIS PROJECT LABOR AGREEMENT.

For questions about this Agreement or Schedule A contact:

Todd Diorio (845) 565-2737 or email tdiorio555@aol.com
President, HVBCTC

SCHEDULE B - LETTER OF ASSENT

The undersigned party confirms that it agrees to be a party to and be bound to the _____ Project Labor Agreement (hereinafter "Agreement" or "PLA") entered into between "COUNCIL" and "NECSD", understands that such Agreement may, from time to time, be amended by the parties or interpreted pursuant to its terms. The terms of the Agreement and its Schedules are hereby incorporated by reference herein.

The undersigned, as a Contractor or Subcontractor (hereinafter "Contractor") on the Project known as the Capital Construction Bond Projects and located within the "NECSD" (hereinafter "Project"), for and in consideration of the award to it of a contract to perform work on said Project, and in further consideration of the mutual promises made in the PLA, a copy of which was received and is acknowledged, hereby:

(1) Accepts and agrees to be bound by the terms and conditions of the Project Labor Agreement, together with any and all schedules, amendments, and supplements now existing or which are later made thereto;

(2) Agrees to be bound by, and incorporates and adopts the legally established collective bargaining agreements (Schedule "A") and local trust agreements as referenced in the Project Labor Agreement and this letter of Assent for this Project;

(3) Authorizes the parties to such local trust agreements to appoint trustees and successor trustees to administer the trust funds and hereby ratifies and accepts the trustees so appointed as if made by the Contractor;

(4) Certifies that it has no commitments or agreements that would preclude its full and complete compliance with the terms and conditions of said Project Labor Agreement. The Contractor agrees to employ labor that can work in harmony with all other labor on the Project and shall require labor harmony from every lower tier subcontractor it engages to work on the Project. Labor harmony disputes/issues shall be subject to the Labor Management Committee's Pre-Job conference provisions;

(5) Agrees to secure from any Contractor(s) (as defined in said Project Labor Agreement) which is or becomes a Subcontractor (of any tier) on the Project, a duly executed Agreement to be bound in from identical to this document;

(6) Agrees that it will not invoke the Most Favored Nations Clause that may be contained in any of its Collective Bargaining Agreements with affiliated unions as a result of the application of this Project Labor Agreement to this Project.

Dated: _____ _____

Name of CM, Contractor

By: Authorized Officer & Title _____ Date:_____

Address

Phone

e-mail

Employer EIN_____Employer NYS IU_____WC#_____

Sworn to before me this
_____ day of_____, 20____

Notary Public

SCHEDULE C – ADMINISTRATION OF AGREEMENT; DESIGNEE

Name of Project: _____

The Owner shall name a Designee to administer this Agreement. The Designee shall be notified in the event any jurisdictional issue, grievance, or other matter concerning this PLA arises, and such Designee shall actively take part in the resolution of the issue. Any signatory Union may request the Designee's assistance in rectifying an issue.

The Designee's contact information is as follows:

_____ (Office Phone)

_____ (Cell Phone)

_____ (Email)

_____ (Signature)

_____ (Print)

Owner

SCHEDULE D – NATIONAL PLAN

A copy of National Plan for the Settlement of Jurisdictional Disputes can be viewed by visiting the Hudson Valley Building and Construction Trades website: builditunion.org

Username: hudsonvalley Password: buildingtrades

DRAFT

AIA® Document A232™ – 2019

General Conditions of the Contract for Construction,
Construction Manager as Adviser Edition

for the following PROJECT:
(Name, and location or address)

Newburgh Enlarged City School District
HVAC Upgrades
SED Project Control No(s).
Gidney Ave. Elementary School SED #44-16-00-01-0-006-015
300 Gidney Ave, Newburgh, NY 12550
Meadow Hill School 44-16-00-01-0-035-014
124 Meadow Hill Road, Newburgh, NY 12550
Temple Hill School 44-16-00-01-0-036-015
525 Union Avenue, New Windsor, NY 12553~~Newburgh Enlarged City School District~~

LaBella Project #2233600 Phase I
~~New Career and Technical Education (CTE) Building~~
~~22 West Street~~
~~Newburgh, New York 12550~~
~~SED# 44-16-00-01-0-053-001~~
~~CSArch Project #108-2303~~

THE CONSTRUCTION MANAGER:
(Name, legal status, and address)

Jacobs Project Management Co.
One Penn Plaza, 24th Floor, Suite 24000
New York, New York 10119

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

Newburgh Enlarged City School District
124 Grand Street~~.~~
Newburgh, New York 12550

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

Labella Associates D.P.C.
21 Fox St., Poughkeepsie,
NY 12601
~~Collins+Scoville Architecture | Engineering | Construction Management D.P.C.~~

~~dba CSArch~~
~~19 Front Street~~
~~Newburgh, New York 12550~~

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

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

This document is intended to be used in conjunction with AIA Documents A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser.

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DRAFT

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User Notes: (1631924039)

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 or proposal 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 Contractors, and by the Owner's own forces and Separate Contractors.

§ 1.1.5 Contractors. Contractors are persons or entities, other than the Contractor or Separate Contractors, who perform Work under contracts with the Owner that are administered by the Architect and Construction Manager.

§ 1.1.6 Separate Contractors. Separate Contractors are persons or entities who perform construction under separate contracts with the Owner not administered by the Architect and Construction Manager.

§ 1.1.7 The Drawings. The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.8 The Specifications. The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.9 Instruments of Service. Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.10 Initial Decision Maker. The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.1.11 Project Labor Agreement. "Project Labor Agreement" refers to a pre-hire collective bargaining agreement between a Contractor and a building and construction trade labor organization establishing the labor organization as the collective bargaining representative for all person who will perform work on a public works project, and which provides that only contractors and

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subcontractors who provide a signed Letter of Assent agreeing to be bound by the Project Labor Agreement.

§ 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. If, in the interpretation of Contract Documents, conflicting requirements within the Drawings and Specifications occur, or if it appears that the Drawings and Specifications are not in agreement, the requirement to be followed shall be decided by the Architect. Addenda supersede the provisions they amended. 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. All dimensions shown on the Drawings are for bidding purposes only. It is the responsibility of the Contractor to verify all dimensions in the field to ensure proper and accurate fit of materials and items to be installed.
2. The lists of equipment, tabulations of data and schedules appearing in the Specifications or Drawings are included for assistance and guidance in arriving at a more complete understanding of the intended installation. They are not intended, or to be construed, as relieving the responsibility of the Contractor in making their own takeoffs.
3. It is intended that all mechanical and electrical systems will be complete and in proper operation and that all construction components will be complete and in compliance with accepted construction practice upon completion of the Work. Even if items are missing from the Plans and/or Specifications, but are normally required for proper operation of mechanical and electrical systems, or to complete otherwise incomplete construction or to meet governing code requirements, they shall be included by the Contractor, unless he sought and received contradictory interpretation or clarification from the Architect in writing.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 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. Sections of the General Requirements, Division 01, govern the execution of all remaining Divisions of the Specifications.
2. It shall be the Contractor's responsibility, when subcontracting any portion of Work, to arrange or group items of work under particular trades to conform with prevailing customs of the trade, regardless of the particular Divisions and Sections of the Specifications in which the work is described.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.2.4 Within the Contract Documents for which each Prime Contractor is responsible, any Work included by reference in any section to another Specification's Section shall be included as Work under the Contract, whether or not it is called for under the Section referred to. Failure to cross-reference such items shall not relieve the Contractor or any Prime Contractor from the obligations to provide such work.

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§ 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~~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, except to the extent of the Owner's rights as set forth in the Owner-Architect Agreement, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, sub-subcontractors, and suppliers 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 the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights. ~~The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, sub-subcontractors, and suppliers 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 the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.~~

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice
§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission
The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

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.

§ 1.7.2 Contractor's Use of Instruments of Service in Electronic Form

§ 1.7.2.1 The Architect may, with the concurrence of the Owner and upon compensation by the Contractor to the Architect, furnish to the Contractor versions of Instruments of Service in digital form. The Instruments of Service executed or identified in

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accordance with Subparagraph 1.1.7 shall prevail in case of an inconsistency with subsequent versions made through manipulatable electronic means.

§ 1.7.2.2 The Contractor shall not transfer or reuse Instruments of Service in electronic or machine-readable form without the prior written consent of the Architect.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

§ 1.9 COMMUNICATION

§ 1.9.1 Construction Manager, Contractor and Architect shall meet periodically at mutually agreed upon intervals for the purpose of establishing procedures to facilitate cooperation, communication and timely responses among the participants. By participating in these meetings, the parties do not intend to create additional contractual obligations or modify the legal relationships which may already exist.

§ 1.10 Project Labor Agreement

§ 1.12.1 THIS PROJECT IS SUBJECT TO A PROJECT LABOR AGREEMENT COVERING CONSTRUCTION OF CONSTRUCTION PROJECTS, NEWBURGH ENLARGED CITY SCHOOL DISTRICT EFFECTIVE FEBRUARY 1, 2021, BETWEEN NEWBURGH ENLARGED CITY SCHOOL DISTRICT, THE HUDSON VALLEY BUILDING AND CONSTRUCTION TRADES COUNCIL ON BEHALF OF ITSELF AND ITS AFFILIATED LOCAL UNIONS, AND SIGNATORY LOCAL UNIONS ON BEHALF OF THEMSELVES AND THEIR MEMBERS ("PLA"), WHICH IS ATTACHED TO THESE GENERAL CONDITIONS AS APPENDIX "A ", THE PROVISIONS OF WHICH MAY BE SPECIFICALLY INCLUDED HEREIN AS WELL AS INCORPORATED BY REFERENCE WITHIN THESE GENERAL CONDITIONS AS FULLY AS IF SET FORTH AT LENGTH HEREIN. TO THE EXTENT OF ANY CONFLICT BETWEEN THE GENERAL/SPECIAL CONDITIONS AND THE PLA, THE PROVISIONS IN THE PLA WILL CONTROL. NOTWITHSTANDING SPECIFIC REFERENCES TO CERTAIN PROVISIONS THE PLA IN THESE GENERAL CONDITIONS, THE CONTRACTORS AND SUBCONTRACTORS OF ALL TIERS MUST COMPLY WITH ALL PROVISIONS OF THE PLA.

ALL SUCCESSFUL BIDDERS AND THEIR SUBCONTRACTORS OF WHATEVER TIER MUST BECOME BOUND BY, AND SIGNATORIES TO, THE PLA BY SIGNING A LETTER OF ASSENT. THE LETTER OF ASSENT REQUIRED OF CONTRACTORS AND SUBCONTRACTORS IS SET FORTH AS SCHEDULE B TO THE PLA.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Construction Manager and the Architect do not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. ~~Such information shall include a correct~~

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~~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 ~~Evidence of the Owner's Financial Arrangements~~

~~§ 2.2.1~~ ~~Prior to commencement of the Work, and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.~~

§ 2.2.2 **~~Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen thirty days of the Contractor's written request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.~~**Omitted**

~~§ 2.2.3~~ ~~After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.~~

~~§ 2.2.4~~ ~~Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' written notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.~~

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 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, assisted by the Construction Manager, shall secure and pay for the building permit.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 The Owner shall retain a construction manager adviser lawfully practicing construction management in the jurisdiction where the Project is located. That person or entity is identified as the Construction Manager in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.4 ~~If the employment of the Construction Manager or Architect terminates, the Owner shall employ a successor construction manager or architect 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.~~Omitted

§ 2.3.5

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The Owner shall furnish, upon written request only and as necessary to complete this work, 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 reasonably rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.
~~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.~~

§ 2.3.6 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.

§ 2.3.7
The Contractor and/or Prime Contractors will be furnished, free of charge, ~~three~~two sets of the Contract Drawings and Project Manuals. Additional sets will be furnished at cost of reproduction and postage and handling when applicable. Subcontractors and other entities desiring copies of Drawings and Project Manuals shall obtain them via one of the Prime Contracts.
~~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.~~

§ 2.3.8 The Owner shall forward all communications to the Contractor through the Construction Manager. Other communication shall be made as set forth in Section 4.2.6.

§ 2.4 Owner's Right to Stop the Work
If the Contractor 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.

§ 2.5 Owner's Right to Carry Out the Work
If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of 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 default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to review by the Construction Manager and prior approval of the Architect, and the Construction Manager or Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for 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. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

§ 2.6 ACCELERATION CLAUSE
§ 2.6.1 The Owner reserves the right to accelerate the work of the Contract. In the event that the Owner directs acceleration, such directive will be only in written form. The Contractor shall keep cost and other project records related to the written acceleration directive separately from normal project costs and records and shall provide a written record of acceleration cost to the Owner on a daily basis.

§ 2.6.2~~3~~ In order to p~~reserve a claim to~~ recover additional costs due to a written acceleration directive, the Contractor must document that additional expenses were incurred and paid by the Contractor. Labor costs recoverable will be only overtime or shift premium costs or the cost of additional laborers brought to the site to accomplish the accelerated work effort. Equipment costs

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recoverable will be only the cost of added equipment mobilized to the site to accomplish the accelerated work effort.

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 Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its 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. Staging and storage areas for materials shall be as agreed on between the Contractor and the Owner's Project Representative.

§ 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 carefully examined the Contract Documents and the site, and represents that the Contractor is thoroughly familiar with the nature and location of the Work, the site, the specific conditions under which the Work is to be performed, and all matters which may in any way affect the Work or its performance. The Contractor further represents that as a result of such examinations and investigations, the Contractor thoroughly understands the Contract Documents and their intent and purpose, and is familiar with all applicable codes, ordinances, laws, regulations, and rules as they apply to the Work, and that the Contractor will abide by same. Claims for additional time or additional compensation as a result of the Contractor's failure to follow the foregoing procedure and to familiarize itself with all local conditions and the Contract Documents are waived and will not be permitted.

~~§ 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 Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information submitted in writing on such form as the 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. If the Contractor performs any construction activity which involves an error, inconsistency or omission in the Contract Documents without first providing notice to the Owner, Architect and Construction Manager of such condition and receiving authorization to proceed, the Contractor shall assume responsibility for such performance and shall bear an appropriate amount of the attributable costs for correction.~~§ 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 2.3.5, 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

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~~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 submit Claims in writing 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, subject to section 15.1.7, 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.

§ 3.2.5 Where existing conditions are obscured or concealed from the Owner or Architect's view prior to the start of this Project's construction activities, portrayal of such conditions in the documents is based on reasonable implications and assumptions. The Owner and Architect do not imply or guarantee to the Contractor in any way that such portrayals in the Documents are accurate or true.

§ 3.2.5.1 Physical investigations and testing of existing conditions were not undertaken by the Architect, unless so indicated in the Contract Documents.

§3.2.5.2 The Contractor may submit written requests for information to the Architect to help facilitate the Contractor's performance of the contract. Prior to submitting each request for information, the Contractor shall first carefully study and compare the Contract Documents, field conditions, other Owner provided information, Contractor prepared Coordination Drawings, and prior Project correspondence and documentation to determine that the information to be requested is not reasonably obtainable from such sources.

§ 3.2.5.3 Each request for information shall be submitted to the Architect, in writing, with a copy to the Construction Manager. Each request for information shall identify the specific sources which were reviewed by the Contractor in an effort to determine the information requested, and a statement to the effect that the information being requested could not be determined from such sources.

§ 3.2.5.4 The Contractor shall submit each request for information sufficiently in advance of the date by which such information is requested in order to allow the Architect sufficient time, in the Architect's professional judgment, to permit adequate review and response and to permit Contractor compliance with the latest construction schedule.

§ 3.2.5.5 The Construction Manager shall maintain a log at the Project site that sequentially numbers and lists each request for information. This log shall contain the Drawings reference or Specification section to which the request pertains, the date of the request, to whom the request was made, by whom the request was made, the nature of the request, and the Architect's resolution thereof. This log shall be reviewed at each Project meeting and the status of the requests for information shall be made part of the minutes of such meetings.

§ 3.2.5.6 The Contractor shall reimburse the Owner amounts charged to the Owner by the Architect or Construction Manager for responding to Contractor requests for information where such information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner provided information, Contractor prepared Coordination Drawings, or prior Project correspondence or documentation.

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§ 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. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be 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 notice to the Owner, the Construction Manager, and the Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. The Construction Manager shall review the proposed alternative for sequencing, constructability, and coordination impacts on the other Contractors. Unless the Architect or the Construction Manager objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures. The Contractor shall be responsible for and coordinate any and all inspections required by any governmental body having jurisdiction over the project. Failure to obtain any permits, licenses or other approvals because of the failure of the Contractor to conform to this requirement shall not extend the Contract time, and the Contractor shall not be entitled to any increase in the contract sum therefor. In addition, any additional costs and/or expenses of any nature incurred by the Owner as a result of the Contractor's failure to conform to this requirement shall constitute a charge against the Contractor's contract. Each contractor shall be responsible for complying with union regulations existing under current labor agreements in performing construction work on the project.

§ 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 or entities 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.

§ 3.3.4 During period of active Construction, the Contractor shall consult daily and cooperate with the Construction Manager. On a daily basis, the Contractor shall keep the Construction Manager and Architect notified of when Work will be starting, restarting, suspended and temporarily or permanently concluding.

§ 3.3.5 Within 15 days of the date of the Notice to Proceed, each Contractor shall submit to the Construction Manager and Architect a list of all Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities.

§ 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 After the Contract has been executed, the Architect in conjunction with the Construction Manager, will consider a formal request for the substitution of products in place of those specified only under the conditions set forth in the General Requirements (Division 01 of the Specifications). Substitutions shall satisfy the following conditions:

1. The materials, products and equipment described in the Contract Documents establish the standard of required quality, function, dimension and appearance expected.
2. Requests for substitutions must be submitted at the time that bids are received.
3. Substitution requests will be considered only if standards are met or exceeded as described above and are subsequently approved in writing by the Architect and Owner.

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4. Each such request shall include the name of the material, product or equipment item for which substitution is requested and a complete description of the proposed substitute, including drawings, cuts, performance and test data and any other information necessary for a complete evaluation.
5. Each such request shall include a statement setting forth any changes in other materials, product or equipment or other work that incorporation of the substitution would require.
6. The burden of proof of the merit of the proposed substitution is upon the proposer.
7. The Architect's decision of approval or disapproval of a proposed substitution shall be final and will be set forth in writing.
8. Additional substitution requests, during construction, will be considered only if substitution is caused by specific material, product or equipment's subsequent removal from, or unavailability in the market place and only at "no change" or "credit" to Contract amount.
9. Contractor's Responsibilities: If any of the following conditions occur due to substitutions, the contractor making the substitution shall bear the cost of such conditions, including payment for services rendered by the Architect:
    (a) Redesign required for any of the Work.
    (b) Material or quantity changes for any of the Work.
    (c) Delays in any of the Work.
    (d) Request for information generated due to substitutions."

~~§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect, in consultation with the Construction Manager, and in accordance with a Change Order or Construction Change Directive.~~

§ 3.4.3 The Contractor, as indicated in the Instructions to Bidders, shall furnish in writing to the Owner through the Construction Manager a list showing the name of the manufacturer proposed to be used for equivalents of products identified in the Specifications, and where applicable, the name of the installing subcontractor. By identifying and submitting a proposed manufacturer and/or installer the Contractor warrants that products furnished and/or installed by them conform to such requirements of the Contract Documents. The Construction Manager, in conjunction with the Architect will ~~promptly~~ reply with reasonable promptness to the Contractor in writing stating whether or not the Owner, Construction Manager or Architect, after due investigation, have reasonable objection to any such proposed manufacturer or installer.

.1 If adequate data on a proposed equivalent manufacturer or installer is not available, the Architect may state that the action will be deferred until the Contractor provides additional data.
.2 Failure of the Owner, Construction Manager or Architect to object to a manufacturer or installer shall not constitute a waiver of the requirements of the Contract Documents.
.3 Products furnished by the listed manufacturer or installed by the listed installer shall conform to such requirements of the Contract Documents.

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§ 3.4.3 The ~~§ 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.~~
Contractor shall insure that its work continues uninterrupted pursuant the Project Schedule during the pendency of any labor dispute.

§ 3.4.4 The Contractor shall comply with the most current Contract Requirements and Prevailing Wage Rate Schedules as published by the Bureau of Public Works, State of New York, Department of Labor established for this Project.

§ 3.4.5 No materials or supplies for the Work shall be purchased by the Contractor or by any subcontractor subject to any chattel mortgage or under a conditional sale or other agreement by which an interest is retained by the seller. The Contractor warrants that he has full title to all materials and supplies used by him in the Work, or resold to the Owner, pursuant to this Contract Document, free from all liens, claims or encumbrances.

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§ 3.4.6 All materials used permanently in the Work shall be new unless otherwise specified. The apparent silence of the Specifications as to any detail described concerning any Work to be done and materials to be furnished shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the first quality are to be used, and all interpretations of the Specifications shall be made on this basis. All material incorporated in the Project Work shall be clean and exhibit no appearance of aging, exposure to weather, prior use, handling or damage of any kind.

§ 3.4.7 Manufacturer's identifications shall be inconspicuous, but where nameplates contain information relative to characteristics or maintenance, they shall be clearly visible and located for easy access.

§ 3.4.8 Equipment intended for permanent installation shall not be operated for temporary purposes without the written permission of the Architect.

§ 3.4.9 Materials shall be delivered in manufacturer's original sealed containers, with complete identification of contents and manufacturer, and kept sealed in original containers until used. Labels shall not be removed until materials have been installed and inspected.

§ 3.4.10 Whenever the Contract Documents require delivery by the Contractor of any materials, equipment or other items, the term delivery shall be deemed to include unloading and storing with proper protection where directed.

§ 3.4.11 Materials shall be applied or installed under proper climactic conditions, not when they may be affected by temperature, moisture, humidity or dust.

§ 3.4.12 As defined by Federal and State Laws, no materials incorporated into the Project Work shall contain asbestos. Material shall be "asbestos-free" containing zero percent (0%) asbestos. The Architect reserves the right to request certification from the material manufacturer through the Contractor for certification that materials installed contact zero percent (0%) asbestos.

§ 3.4.13 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.

.1 A sufficient force of competent experienced workman, foreman and superintendents shall be employed at all times to permit the Work to be pursued with diligence until completion.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner, Construction Manager, and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements 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.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

Exempt from Sales Tax: New York State Sales Tax is not applicable to any materials and supplies to be incorporated into Work under the terms of the Contract, the Owner being exempt therefrom. There is no exemption from the sales or use tax on charges to the Contractor or subcontractor for lease of tools, machinery, equipment or other property used in conjunction with the Project. The Contractors and subcontractors shall be solely responsible for and pay any and all applicable

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taxes, including sales and compensating use taxes, on such leased tools, machinery, equipment or other property, and for materials not incorporated in the Project and the amount of such taxes, if any, shall be deemed included in executed Base Bid.
~~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 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 of and completion of the contract, which are legally required.
~~**§ 3.7.1** Unless otherwise provided in the Contract Documents, the Owner, assisted by 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~~which it knows or should have known was 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 in writing before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect and Construction Manager will ~~promptly~~ investigate such conditions with reasonable promptness 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 that an equitable adjustment be made 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, stating the reasons. If the Owner or Contractor disputes the Architect's determination or recommendation, either party may submit a Claim 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.~~

.1 Contingency Allowances shall cover the direct cost to the Contractor for labor, materials and equipment, including delivery, unloading, storage, handling and installation. They do not include the Contractor's overhead and profit, including the costs of bonds, insurance, administration and supervision, which costs should be carried as part of the Contract Sum.

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~~§ 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.~~

§ 3.8.2~~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 full time during performance of the Work. The Superintendent shall be the same individual throughout the duration of the project. ~~-~~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 notify the Owner and Architect, through the Construction Manager, of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Construction Manager may notify the Contractor, stating whether the Owner, the Construction Manager, or the Architect (1) has reasonable objection to the proposed superintendent or (2) require additional time for review. Failure of the Construction Manager to provide notice 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 and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information, and the Construction Manager's use in developing the Project schedule, a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. 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 Contractors, or the construction or operations of the Owner's own forces or Separate Contractors.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Construction Manager's and Architect's approval. The Architect and Construction Manager's approval shall not be unreasonably 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 in their respective judgments to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved 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 the Owner in reviewing and coordinating all schedules for incorporation into the Project schedule that is prepared by the Construction Manager. The Contractor

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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 ~~make available~~maintain~~,~~ at the Project site for the Owner two sets of record Drawings and one set of record Specifications, Addenda, ~~the Contract Documents, including~~ Change Orders, Allowance Authorizations, ~~Construction Change Directives,~~ and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of ~~the~~ approved Shop Drawings, Product Data, Samples, and similar required submittals in good order and condition. . ~~Each Prime~~The Contractor shall mark these documents on a weekly basis to record all approved changes, and to record the dimensional locations of his installed work if it deviates from that shown on the Contract or Shop Drawings. Particular attention shall be given to site utilities, the location of valves, HVAC equipment, and all ductwork and major electrical conduit. These shall be in electronic form or paper copy, available to the Construction Manager, Architect, and Owner, 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 how 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 4.2.10 through 4.2.12. Informational submittals upon which the Construction Manager and Architect are not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Construction Manager or Architect without action.

§ 3.12.5 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 Contractors, Separate Contractors, or the Owner's own forces. The Contractor shall cooperate with the Construction Manager in the coordination of the Contractor's Shop Drawings, Product Data, Samples, and similar submittals with related documents submitted by other Contractors.

§ 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 Work performed without approved shop drawings, product data, samples or similar submittals as required by the Specifications is subject to all comments and conditions of approval regardless of Work progress. Completed work must be in accordance with all comments and conditions of approval regardless of Work progress. Completed work must be in accordance with all comments on approved submittals. Any portion of the Work performed prior to review and approval by the Construction

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Manager and Architect of required Shop Drawings, Product Data, Samples, or other Submittals, is performed at Contractor's risk. No Contract adjustments will be made to correct or modify Work installed without prior written approval of the Construction Manager and Architect.

~~§ 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 the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified 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 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.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner, the Architect, and the Construction Manager shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Construction Manager shall review submittals for sequencing, constructability, and coordination impacts on other Contractors.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Construction Manager and Architect at the time and in the form specified by the Architect.

§ 3.13 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, 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.

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§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner, Separate Contractors, or of other Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner, Separate Contractors, or by other Contractors except with written consent of the Construction Manager, Owner, and such other Contractors or Separate Contractors. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Separate Contractors, other Contractors, or the Owner, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. 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. Upon completion of the work, and prior to final inspection and acceptable of the same by the owner, the contractor shall thoroughly clean all Work, remedy any defetcs, and leave the project in goos conditions.

§ 3.16 Access to Work

The Contractor shall provide the Owner, Construction Manager, and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner, Construction Manager, and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner, Architect, or Construction Manager. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect through the Construction Manager.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall defend, indemnify and hold harmless the Owner, Construction Manager, Architect, each of their consultant's, officers, board members, agents, and employees from and against any suits, claims, damages, losses, or expenses, including but not limited to attorneys' fees and litigation costs, arising out of or resulting from performance of the Work, provided that such suit, claim, damage, loss or expense is attributable to any bodily injury, sickness, disease, or death, or injury to or destruction of any tangible property, including loss of use resulting therefrom, but only to the extent caused in whole or in part by the act, omission, fault, breach of contract, breach of warranty or statutory violation of the Contractor, a subcontractor, or any person or entity directly or indirectly employed by them, or any person or entity for whose acts they may be liable or arises out of operation of law as a consequence of any act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of the above may be liable, regardless of whether any of them has been negligent. This provision shall not be construed to require the Contractor to indemnify the Owner, Construction Manager, or Architect for the negligence of the Owner, Construction Manager, or Architect to the extent such negligence, in whole or in part, proximately caused the damages resulting in the suit, claim, damage, loss or expense."

~~§ 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~~

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~~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 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

§ 3.18.3 The indemnification provisions contained in this **§ 3.18** shall survive the completion or termination of the Contract

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§ 3.19 DAILY RECORDS CLAUSE

§3.19.1 The Contractor shall prepare and maintain Daily Inspection Records to document the progress of the work on a daily basis. Such daily records shall include a detailed daily accounting of all labor and all equipment on the site for the Contractor and all subcontractors, at any tier. Such daily records will make a clear distinction between work being performed under Change Order, base scope work and/or disputed work.

3.19.2 In the event that any labor or equipment is idled, solely as a result of Owner actions or inactions, the daily records shall record which laborers and equipment were idled and for how long. In the event that specific work activities were stopped, solely as a result of Owner actions or inactions, and labor and equipment was reassigned to perform work on other activities, the daily records will make a clear record of which activities were stopped and where labor and equipment was redirected to.

§3.19.3 Such daily records shall be copied and provided to the Owner at the end of every week.

ARTICLE 4 ARCHITECT AND CONSTRUCTION MANAGER

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner and Architect.

~~**§ 4.1.2** The Construction Manager is the person or entity retained by the Owner pursuant to Section 2.3.3 and identified as such in the Agreement.~~

~~**§ 4.1.3** 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.~~

§ 4.2 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 an Owner's Representative (1) during construction, (2) until 90 days after issuance of the State Education Department's Certificate of Substantial Completion or issuance of the Final Project Certificate for Payment, whichever is later, and (3) with the Owner's concurrence, from time to time during the one-year period for correction of Work described in Section 12.2. The Construction Manager and Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified in writing in accordance with other provisions 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~~

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~~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, ~~or is~~ to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if, in its professional judgment, the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of the site visits, the Architect will keep the Owner and the Construction Manager reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner and Construction Manager known deviations from the Contract Documents and defects and deficiencies observed in the Work.

§ 4.2.2.1 The Contractor shall reimburse the Owner for compensation paid to the Architect for additional site visits made necessary by the fault, neglect or request of the Contractor.

§ 4.2.3 The Construction Manager shall provide one or more representatives who shall be in attendance at the Project site whenever the Work is being performed. The Construction Manager will determine in general if the Work observed is being performed in accordance with the Contract Documents, will keep the Owner and Architect reasonably informed of the progress of the Work, and will promptly report to the Owner and Architect known deviations from the Contract Documents and the most recent Project schedule, and defects and deficiencies observed in the Work.

§ 4.2.4 The Construction Manager will schedule and coordinate the activities of the Contractor and other Contractors in accordance with the latest approved Project schedule.

§ 4.2.5 The Construction Manager, except to the extent required by Section 4.2.4, and Architect will not have control over, charge of, or responsibility for, the 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, 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. The Owner shall communicate with the Contractor and the Construction Manager's consultants through the Construction Manager about matters arising out of or relating to the Contract Documents. The Owner and Construction Manager shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Construction Manager otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with other Contractors shall be through the Construction Manager. Communications by and with the Owner's own forces and Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 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. Whenever the Construction Manager considers it necessary or advisable, the Construction Manager will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, upon written authorization of the Owner, whether or not the 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

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give rise to a duty or responsibility of the Architect or the Construction Manager to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons performing any of the Work.

§ 4.2.9 Utilizing the submittal schedule provided by the Contractor, the Construction Manager shall prepare, and revise as necessary, a Project submittal schedule incorporating information from other Contractors, the Owner, Owner's consultants, Owner's Separate Contractors and vendors, governmental agencies, and participants in the Project under the management of the Construction Manager. The Project submittal schedule and any revisions shall be submitted to the Architect for approval.

§ 4.2.10 The Construction Manager will receive and promptly 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 other Contractors, the Construction Manager will also check and coordinate the information contained within each submittal received from the Contractor and other 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.

§ 4.2.11 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Upon the Architect's completed review, the Architect shall transmit its submittal review to the Construction Manager.

§ 4.2.12 Review of the Contractor's submittals by the 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 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.

§ 4.2.13 The Construction Manager will prepare Change Orders and Construction Change Directives.

§ 4.2.14 The Construction Manager and the Architect will take appropriate action on Change Orders or Construction Change Directives in accordance with Article 7, and the Architect will have authority to order minor changes in the Work as provided in Section 7.4. The Architect, in consultation with the Construction Manager, will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.15 Utilizing the documents provided by the Contractor, the Construction Manager will maintain at the site for the Owner one copy of all Contract Documents, approved Shop Drawings, Product Data, Samples, and similar required submittals, in good order and marked currently to record all changes and selections made during construction. These will be available to the Architect and the Contractor, and will be delivered to the Owner upon completion of the Project.

§ 4.2.16 The Construction Manager will assist the Architect in conducting inspections to determine the date or 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.

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§ 4.2.17 ~~If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site.~~ The Owner shall notify the Construction Manager of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.18 The Architect will interpret and decide matters concerning performance of the Contractor under, and requirements of, the Contract Documents on written request of the Construction Manager, Owner, or Contractor through the Construction Manager. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.19 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. The Architect will not be liable for the results of any such interpre~~s~~tations or decisions rendered in good faith and in accordance with its professional judgment. ~~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.~~

~~**§ 4.2.20** The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.~~

§ 4.2.21 The Construction Manager will receive and review requests for information from the Contractor, and forward each request for information to the Architect, with the Construction Manager's recommendation. The Architect will review and respond in writing, through 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 but, in any event, allowing the Architect sufficient time in its professional judgment to properly ~~–~~review the request. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include other Contractors or Separate Contractors or the subcontractors of other Contractors or Separate Contractors.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 ~~Unless otherwise~~As stated in the ~~Contract Documents~~bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall notify in writing ~~the Construction Manager,~~ for review by the ~~Owner,~~ Construction Manager and Architect, of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Construction Manager may notify the Contractor whether the Owner, the Construction Manager or the Architect (1) has reasonable objection to any such proposed person or entity or, (2) requires additional time for review.

§ 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

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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 for one previously selected if the Owner, Construction Manager or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including, but not limited to, the responsibility for safety of the Subcontractor's Work and obligations to defend and indemnify, that the Contractor, by these Contract 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; 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 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 SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction with Own Forces and to Award Other Contracts

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When the Owner performs construction or operations with the Owner's own forces or Separate Contractors, the Owner shall provide for coordination of such forces and Separate Contractors with the Work of the Contractor, who shall cooperate with them.

§ 6.1.3 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

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§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner's own forces, Separate Contractors, Construction Manager and other 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, Separate Contractors or other Contractors, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Construction Manager and Architect in writing and in detail of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor or other Contractors that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Construction Manager and the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's or other Contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractors or other Contractors that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs, including costs that are payable to a Separate Contractors or to other Contractors, because of the Contractor's delays, improperly timed activities or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction, or to property of the Owner, Separate Contractors, or other Contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner, Separate Contractors, and other Contractors shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, other Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Construction Manager, with notice to the Architect, will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, 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. The Contractor shall proceed promptly with changes in the Work, 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.

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§ 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 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Construction Manager shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the ~~Specifications~~Contract Documents~~Agreement~~, or if no such amount is set forth in the ~~specifications~~Contract Documents~~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 7.3.4 shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance directly related to the work, and other employee costs approved by the Construction Manager and Architect;

.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 and equipment normally encumbered to perform the work, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, ~~and sales, use, or similar taxes,~~ directly related to the work~~change~~; and

~~.5~~

.5 Costs of supervision by the Site Superintendent directly attributable to the change, if the change requires an extension of time beyond that time indicated in the Contract.

~~Costs of supervision and field office personnel directly attributable to the change.~~

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction Manager of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 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.

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§ 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 may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Construction Manager and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Construction Manager that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

§ 7.5 OVERHEAD AND PROFIT

§ 7.5.1 The combined overhead and profit included in the total cost to the Owner shall be based on the following schedule:

§ 7.5.1.a ~~Prime~~ The Contractor: For Work performed by the ~~Prime~~ The Contractor's own forces, markup shall not exceed a total of fifteen percent (15%), of the value of labor and materials (L+M).

.1 Example: Total ~~Prime~~ Contractor Amount = (L+M) + 15% O&P

§ 7.5.1.b ~~Prime~~ Contractor's Subcontractor: For Work performed by the Subcontractor's own forces, markup shall not exceed a total of ten percent (10%), of the value of labor and material (L+M). For the ~~Prime~~ Contractor, for work performed by that ~~Prime~~ Contractor's Subcontractor, markup shall not exceed five percent (5%) for the value of the Subcontractor amount.

.1 Example: Total Subcontractor Amount = (L+M) + 10% O&P
.2 Example: Total ~~Prime~~ Contractor Amount = Total Subcontract Amount + 5% O&P

§ 7.5.1.c Sub-Subcontractor: For Work performed by the Subcontractor's own forces, markup shall not exceed a total of five percent (5%) of the value of labor and materials (L+M). For the Subcontractor, for work performed by the Subcontractor's Sub-subcontract, markup shall not exceed 5% of the Subcontractor Amount. For the Prime Contractor, for Work performed by the Subcontractor's Sub-subcontractor, markup shall not exceed 5% of the Subcontractor Amount.

.1 Example: Total Sub-subcontractor Amount = (L+M) + 5% O&P
.2 Example: Total Subcontractor Amount = Sub-subcontractor Amount + 5% O&P
.3 Example: Total ~~Prime~~ Contractor Amount = Subcontractor Amount + 5% O&P

§ 7.5.2 Performance and Payment Bond Adjustments: Do not itemize increases for bond premiums for each individual Change Order per General Conditions of the Contract, Paragraph 11.4.

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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. The Work of this Project shall be substantially complete on or before the dates indicated in Milestone Construction Schedule for those portions of the Work so stipulated. Actual damages may be assessed by the Owner if specified completion dates are not adhered to by the Contractor.

~~§ 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, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 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 (1) an act or neglect of the Owner, Architect, Construction Manager, or an employee of any of them, or of the Owner's own forces, Separate Contractors, or other Contractors; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts and the Architect, based on the recommendation of the Construction Manager, determines justify delay, then the Contract Time shall be extended 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 The Owner shall not be liable to the Contractor and/or any subcontractor for claims or 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 and hereby waives any claim for damages for delay, including, but not limited to, those resulting from increased labor or material costs; directions given or not given by the Owner, Construction Manager or Architect, including scheduling and coordination of the Work; the Architect's preparation of drawings and specifications or review of shop drawings and requests for instruction(s); or, on account of any delay, obstruction or hindrance for any cause whatsoever by the Owner, Construction Manager, Architect, or any other contractor on the project, whether or not foreseeable or anticipated. The Contractor agrees that its sole right and remedy therefor 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."**

~~§ 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.~~

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ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

~~Where the Contract is based on a stipulated sum or Guaranteed Maximum Price~~As indicated in the Contract Documents, the Contractor shall submit a schedule of values to the Construction Manager, before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Construction Manager and the Architect. This schedule, unless objected to by the Construction Manager or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. The Construction Manager shall forward to the Architect the Contractor's schedule of values. Any changes to the schedule of values shall be submitted to the Construction Manager and supported by such data to substantiate its accuracy as the Construction Manager and the Architect may require, and unless objected to by the Construction Manager or the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 The Contractor shall submit applications for payment in accordance with Specification Section "Payment Procedures." ~~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. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner, Construction Manager or Architect require, such as copies of requisitions, and releases of waivers of lien from Subcontractors and 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 supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.1.3 Until Substantial Completion, the Owner shall pay ninety-five percent (95%) of the amount due to the Contractor on account of progress payments.

§ 9.3.1.4 When the work or major portions thereof as contemplated by the terms of the Contract are substantially complete, the Contractor shall submit to the Construction Manager and Architect a requisition for payment of the remaining amount of the Contract balance. Upon receipt of such requisition, the Owner shall approve and promptly pay the remaining amount of the Contract less two times the value of any remaining items to be completed and an amount necessary to satisfy any claims, liens or judgments against the Contractor, which have not been suitably discharged, as determined by the Architect in conjunction with the Construction Manager. Any claims, liens or judgments referred to in this clause shall pertain to the Project and shall be filed in accordance with the terms of the Contract, and applicable laws.

§ 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,

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and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site. The Owner shall have the right, at any time on reasonable notice to inspect materials and equipment which have been stored off the site in accordance with this paragraph.

§ 9.3.2.1 Proof of insurance for items stored off site and copies of invoices are to be provided with Applications for Payment requesting payment for stored materials.

§ 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, suppliers, or other persons or entities that 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 (1) issue to the Owner a Certificate for Payment, in the full amount of the Application for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward to the Contractor the Architect's notice of withholding certification.

§ 9.4.2 Where there is more than one Contractor performing portions of the Project, the Construction Manager will, within seven days after the Construction Manager receives all of the Contractors' Applications for Payment: (1) review the Applications and certify the amount the Construction Manager determines is due each of the Contractors; (2) prepare a Summary of Contractors' Applications for Payment by combining information from each Contractor's application with information from similar applications for progress payments from the other Contractors; (3) prepare a Project Application and Certificate for Payment; (4) certify the amount the Construction Manager determines is due all Contractors; and (5) forward the Summary of Contractors' Applications for Payment and Project Application and Certificate for Payment to the Architect.

§ 9.4.2.1 Within seven days after the Architect receives the Project Application and Project Certificate for Payment and the Summary of Contractors' Applications for Payment from the Construction Manager, the Architect will either (1) issue to the Owner a Project Certificate for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Project Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Project Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward the Architect's notice of withholding certification to the Contractors.

§ 9.4.3 The Construction Manager's certification of an Application for Payment or, in the case of more than one Contractor, a Project Application and Certificate for Payment, shall be based upon the Construction Manager's evaluation of the Work and the data in the Application or Applications 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, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is, or Contractors are, entitled to payment in the amount certified.

§ 9.4.4 The Architect's issuance of a Certificate for Payment or, in the case of more than one Contractor, Project Application and Certificate for Payment, shall be based upon the Architect's evaluation of the Work, the recommendation of the Construction Manager, and data in the Application for Payment or Project Application for Payment. The Architect's certification will constitute a representation

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that, to the best of the Architect's judgment, knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is, or Contractors are, entitled to payment in the amount certified.

§ 9.4.5 The representations made pursuant to Sections 9.4.3 and 9.4.4 are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Construction Manager or Architect.

§ 9.4.6 The issuance of a 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 construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and 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 9.4.3 and 9.4.4 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 9.4.2. 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, 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 suppliers for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- **.5** damage to the Owner or a Separate Contractor or other 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.
- **.8** failure of Contractor to provide executed supplementary bid forms, performance and payment bonds or a current Certificate of Insurance.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect or Construction Manager withholds certification for payment under Section 9.5.1, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier 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.

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§ 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 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 and suppliers 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 or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to 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 or provided by 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, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

~~**§ 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' 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 shutdown, 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.

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§ 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 written list of items to be completed or corrected prior to ~~final payment~~Architect's first (1st) inspection. 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 Contractor's punchlist, 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 Contractor's ~~list~~punchlist, which is not sufficiently complete in accordance with 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.

§ 9.8.3.1 Except with the consent of the Owner, the Architect in conjunction with the Construction Manager will perform no more than three (3) inspections to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The three (3) inspections will include not only determining if the area is substantially complete, but will also include any follow-up inspection to confirm *all* open punchlist items have been completed for that specific item. The Owner may deduct from the Contract Sum amounts paid to the Architect for any additional inspections necessitated by the Contractor's misrepresentation of conditions.

§ 9.8.4 When the Architect, assisted by the Construction Manager, determines that the Work of all of the Contractors, 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; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and 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 the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the 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. The payment shall be sufficient to increase the total payments to one-hundred percent (100%) of the Contract Sum, less two times the value of any remaining items to be completed and any amount necessary to satisfy claims, liens or judgments against the Contractor which have not been suitably discharged, as determined by the Architect assisted by the Construction Manager.

§ 9.8.6 In the event the Contractor does not achieve final completion within ninety (90) days after the date of Substantial Completion, allowing for any approved extensions of the Contract time, Contractor shall not be entitled to any further payment and Contractor agrees that such failure to complete the work within the time set forth above shall constitute a waiver of all claims by the Contractor to any money that may be due. This provision shall not operate as a waiver by the Owner of any claims or remedies of any nature against the Contractor arising out of the Contract.

§ 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 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

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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 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 shall perform an inspection to confirm the completion of Work of the Contractor. The Construction Manager shall make recommendations to the Architect when the Work of all of the Contractors is ready for final inspection, and shall then forward the Contractors' notices and Application for Payment or Project Application for Payment, to the Architect, who will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Construction Manager and Architect will promptly issue a final Certificate for Payment or Project Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Construction Manager's and Architect's final Certificate for Payment or Project Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.1.1 Except with the consent of the Owner, the Architect in conjunction with the Construction Manager will perform no more than two (2) inspections to determine whether the Work or a designated portion thereof has attained Final Completion in accordance with the Contract Documents. The Owner may deduct from the Contract Sum amounts paid to the Architect for any additional inspections necessitated by the Contractor's misrepresentation of final completion.

§ 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, (3) a written statement that the Contractor knows of no 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 (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner and (7) all Project closeout documents per the General Conditions of the Contract. 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, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance 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 the lien, claim, security interest, or encumbrance, 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, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be

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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.

§ 9.10.3.1 Exception is made for the Contractor expressly retained for the removal of lead, asbestos or polychlorinated (PCB) from the site. In this condition, all Contract Specifications and Drawings shall govern the handling of this material.

§ 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;
- **.3** terms of special warranties required by the Contract Documents; or
- **.4** audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a 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.

~~**§ 9.10.6** In the event the Contractor does not achieve final completion within thirty (30) days after the date of substantial completion, allowing for any approved extensions of the contract time, Contractor shall not be entitled to any further payment and Contractor hereby agrees that such failure to complete the work within the time set forth above shall constitute a waiver of all claims by the Contractor to any money that may be due. This provision shall not operate as a waiver by the Owner of any claims or remedies of any nature against the Contractor arising out of the contract.~~

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, a Subcontractor, or a Sub-subcontractor;
- **.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, Separate Contractors, 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 implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

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§ 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. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is 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, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. 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 notify the Owner, Construction Manager and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the 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 the material or substance or who are to perform the task of removal or safe containment of the 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 by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.2.1 Exception is made for the Contractor expressly retained for the removal of lead, asbestos or polychlorinated (PCB) from the site. In this condition, all Contract Specifications and Drawings shall govern the handling of this material.

~~**§ 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~~

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~~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 hazardous 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 hazardous 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 reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances 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 reimburse 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 Insurance and Bonds

§ 11.1.1 The Contractor shall obtain, pay for and keep in full force and effect during the entire term of this Contract, and during the performance, final completion and acceptance of any Work, and after the term of this Contract (as may be specified herein) insurance, in a company or companies lawfully licensed and admitted to do business in the jurisdiction in which the Project is located, as designated by this Article 11 and any other insurance required by applicable law, regulations, or orders of state, municipality or other entity having jurisdiction over the Work or the Project. Contractor shall not take any action, or omit to take any action that would suspend or invalidate any of the required coverages during the time period such coverages are required to be in effect.

§ 11.1.1.1 Workers' Compensation and NYS Disability Insurance. and any other federal and/or state coverages as appropriate, including but not limited to: Occupational Disease Benefits, Voluntary Compensation, and Disability Benefits, for not less than the statutory requirements, and if applicable an "Other States Endorsement"; and

Statutory Workers' Compensation (c-105.2 or U-26.3); and NYS Disability (DB120.1) Insurance 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 the state. The form can be completed and submitted directly to the WC Board online.

§ 11.1.1.2 Commercial General Liability Insurance is to be provided under the Insurance Service Office's (ISO) most current form, on a project specific basis, with limits not less than the following required limits:

Each Occurrence:	$1,000,000
General Aggregate:	$2,000,000
Products and Completed/Operations:	$2,000,000
Personal & Advertising Injury:	$1,000,000
Fire Damage:	$ 100,000
Medical Expense:	$ 10,000

The general aggregate shall apply on a per-project basis.

Such insurance shall include the following coverages:

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(i) claims for damages because of bodily injury, occupational sickness or disease, or death;
(ii) claims for damages insured by usual personal injury liability coverage;
(iii) claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
(iv) premises operations;
(v) product liability and completed operations, and the policy shall specifically include coverage for two (2) years of extended completed operations coverage, which will commence immediately following the expiration date of the Commercial General Liability policy;
(vi) contractual liability covering liabilities assumed under the Contract (including the tort liability of another assumed in a contract), and including, coverage for claims arising out of construction or demolition operations when working within 50 feet of railroad track;
(vii) personal injury and advertising injury liability;
(viii) extended bodily injury coverage with respect to bodily injury resulting from the use of reasonable force to protect persons or property;
(ix) medical payments coverage;
(x) broad form property damage liability coverage, including coverage for completed operations;
(xi) explosion, collapse, and underground property damage (XCU);
(xii) construction means and methods;
(xiii) independent contractors;

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(xiv) Owner and other's identified herein as additional insured to be specifically evidenced as additional insureds via ISO Endorsements CG 2037 and GC2038.

(xv) No coverage restrictions and/or exclusions involving NYS Labor Law Statutes or gravity related injuries.

(xvi) No policies containing escape clauses or exclusions contrary to the owner's interests will be accepted.

§11.1.1.3 Owners Contractors Protective (OCP) Insurance for projects less than or equal to $1,000,000 and/or on 1 story (10 feet) only; $1,000,000 per occurrence, $2,000,000 aggregate with the Owner as the name insured.

For Projects greater than $1,000,000 and/or work over 1 story (10 feet); $2,000,000 per occurrence, $4,000,000 aggregate with the Owner as the named insured.

The OCP Policy must be with a NYS licensed and admitted carrier.

The Owner will be the Named Insured on OCP Policies. There will be no Additional Insureds on any OCP Policies.

§11.1.1.4 Automobile Liability Insurance, including uninsured/underinsured and medical payment protection, and including all owned, non-owned and hired autos, with a limit of liability of not less than $1,000,000 each occurrence (combined single limit for personal injury, including bodily injury or death, and property damage).

§11.1.1.5 Umbrella/Excess Insurance, providing excess coverage in excess of the limits for the insurance coverages required by Sections 11.1.1.1, 11.1.1.2, and 11.1.1.3 above, with such excess/umbrella coverage being at least as broad as each and every one of the underlying policies), with the provision that coverage shall extend for a period of at least two (2) years from the date of final completion and acceptance by Owner of all Work.

$5,000,000 each Occurrence and Aggregate for general construction and no work at elevation (1 story or 10 feet) and project values less than or equal to $1,000,000.

$10,000,000 each Occurrence and Aggregate for high-risk construction, work at elevation (>1 story or 10 feet) and project values greater than $1,000,000.

Umbrella/Excess coverage shall be on a follow-form basis or provide broader coverage over the General Liability and Auto Liability coverages.

§ 11.1.2 All insurance shall be written on an occurrence basis. Completed copies of the endorsements must be attached to the Certificate of Insurance to include the General Liability, Auto and Umbrella/Excess Coverages.

§ 11.1.3 Contractor's insurance requirements shall be provided by an insurance carrier licensed and admitted to do business in the State of New York and have an A.M. Best Rating of A(-)8 or better as determine in the most recent A.M. Best Publication.

§ 11.1.4 Insurance coverage to be provided by the Contractor shall state that the Contractor's coverage shall be "primary" and non-contributing to any insurances (or self-insurance), including any deductible, maintained by, or provided to Owner or the other Additional Insureds; and shall contain a Waiver of Subrogation in favor of Owner and the other Additional Insureds, so that in no event shall the insurance carriers have any right of recovery against Owner, the other Additional Insureds, or the agents or employees or either of them; and shall contain a separation of insured provision (severability of interest clause). If the Owner or another Additional Insured has other insurance

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which is applicable to the loss, such other insurance shall be on an excess or contingent basis.

§ 11.1.5 In the event that any of the insurance coverage to be provided by the Contractor contains a deductible or self-insured retention, the Contractor shall indemnify and hold the Owner, and any Additional Insured harmless from the payment of such deductible, which deductible shall in all circumstances remain the sole obligation and expense of the Contractor.

§ 11.1.6 The Contractor shall require all Subcontractors to carry the same insurance coverage's and limits of liability as set forth herein and submit same to the Owner through the Construction Manager and obtain approval prior to start of any Work. This includes an OCP policy. To facilitate the review process, the Contractor shall submit the Subcontractors insurance a minimum of 4 weeks before they are scheduled to start work on site. In the event Contractor fails to obtain the required certificates of insurance from Subcontractor and provide them to Construction Manager and a claim is made or suffered, the Contractor shall, to the fullest extent permitted by law, indemnify, defend, and hold harmless the Owner and the Additional Insureds 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 Documents and shall survive the term or earlier termination of the Contract.

§ 11.1.7 Environmental Impairment Liability (Pollution Insurance) (EIL): All Contractors and Subcontractors involved with the removal and/or abatement of pollutants (including but not limited to asbestos abatement contractors, lead abatement contractors, roofing contractors, tank removal contractors) are required to maintain a minimum of $2,000,000 EIL coverage. Owner and all other parties required by this Contract to be Additional Insured and all others identified by Owner as such, shall be included as Additional Insured on any EIL policy on a primary and non-contributing basis.

§ 11.1.8 The Contractor assumes responsibility for all injury or destruction of the Contractor's and Subcontractors' materials, tools, machinery, equipment, appliances, shoring, scaffolding, and personal property of Contractor's and Subcontractors' employees from whatever cause arises. Any policy of insurance secured covering the Contractor's or Subcontractors' property 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.

§ 11.1.9 Additional Insured/Certificate Holder. The Contractor shall cause the commercial liability and other coverage required by the Contract to include the following as Additional Insureds:

(i) Newburgh Enlarged City School District;
(ii) Members of the Board of the Newburgh Enlarged City School District;
(iii) Jacobs Project Management
(iv) LaBella Associates; and
(v) Any directors, partners, members, shareholders, officers, employees, successors, assigns, heirs, affiliates, agents, and representatives of each and any of the foregoing.

Contractor shall also add any other entities and/or individuals as may be required by Owner as

Additional Insured. The certificate holder shall be Newburgh Enlarged City School District.

Contractor shall provide an Additional Insured endorsement that expressly names each of the above identified Additional Insureds (non-blanket) and shall ensure that the endorsement does not include language that requires an Additional Insured to have a written contract with the named insured for

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coverage to apply.

All subcontractors shall have a contract with the prime contractor and will name the district as an additional insured on a primary, non-contributory basis and include a waiver of subrogation. Additional insured status shall be provided by standard or other endorsements that extend coverage to the District/BOCES for on-going operations (CG 20 38) and products and completed operations (CG 20 37). The decision to accept an endorsement rest solely with the District/BOCES. A completed copy of the endorsements must be attached to the Certificate of Insurance

§ 11.1.10 Certificates of insurance acceptable to the Owner shall be provided to the Construction Manager and filed with the Owner prior to commencement of the Work. A fully completed New York Construction Certificate of Liability Insurance Addendum (ACORD 855 2014/15) must be included with the certificates of insurance. For any "yes" answers on items G through L on this form, additional details must be provided in writing – policy exclusions may not be accepted.

The certificates and the insurance policies shall contain a provision that coverages afforded under the policies will not be allowed to be materially changed or canceled or allowed to expire until at least thirty (30) days' prior written notice has been given to the Owner via Certified/Registered Mail. If any of the foregoing insurance coverages are required to remain in force after final payment, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

§ 11.1.11 The Contractor acknowledges that its failure to obtain or keep current the required insurance coverage shall constitute a material breach of contract and subjects the Contractor to liability for damages the Owner (or others, including without limitation the other Additional Insured) sustains as a result of such breach. In addition, the Contractor shall be responsible to the fullest extent permitted by law for the indemnification to the Owner and all

Additional Insured of any and all costs associated with such lapse in coverage, including but not limited to reasonable attorneys' fees (and this indemnification obligation shall survive the term or earlier termination of the Contract).

§ 11.1.12 The amount of insurance required by the Contract shall not be construed to be a limitation of the liability of on the part of the Contractor or any of its Subcontractors.

§ 11.1.13 No act or omission of any insurance agent, broker, or insurance company representative shall relieve Contractor of any of its obligations under this Contract.

§ 11.1.14 Notwithstanding anything in Section 11.3 and its subsections to the contrary, 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 on a full replacement cost basis. The Contractor is responsible for all deductible amounts.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.5 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice

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directly to the Owner, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall obtain, pay for and keep in full force and effect during the entire term of this Contract, and during the performance, final completion and acceptance of any Work, and after the term of this Contract (as may be specified herein) insurance, in a company or companies lawfully licensed to do business in the jurisdiction in which the Project is located, as designated by this Article 11 and any other insurance required by applicable law, regulations, or orders of state, municipality or other entity having jurisdiction over the Work or the Project. Contractor shall not take any action, or omit to take any action that would suspend or invalidate any of the required coverages during the time period such coverages are required to be in effect.

§ 11.1.1.1 Workers' Compensation and NYS Disability Insurance. and any other federal and/or state coverages as appropriate, including but not limited to: Occupational Disease Benefits, Voluntary Compensation, and Disability Benefits, for not less than the statutory requirements, and if applicable an "Other States Endorsement"; and

Statutory Workers' Compensation (c-105.2 or U-26.3); and NYS Disability Insurance 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 the state. The form can be completed and submitted directly to the WC Board online.

§ 11.1.1.2 Commercial General Liability Insurance is to be provided under the Insurance Service Office's (ISO) most current form, on a project specific basis, with limits not less than the following required limits:

Each Occurrence:	$1,000,000
General Aggregate:	$2,000,000
Products and Completed/Operations:	$2,000,000
Personal & Advertising Injury:	$1,000,000
Fire Damage:	$ 100,000
Medical Expense:	$ 10,000

The general aggregate shall apply on a per-project basis.

Such insurance shall include the following coverages:

- claims for damages because of bodily injury, occupational sickness or disease, or death;
- claims for damages insured by usual personal injury liability coverage;
- claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- premises operations;
- product liability and completed operations, and the policy shall specifically include coverage for two (2) years of extended completed operations coverage, which will commence immediately following the expiration date of the Commercial General Liability policy;
- owners protective;
- contractors protective;
- contractual liability covering liabilities assumed under the Contract (including the tort liability of another assumed in a contract), and including, coverage for claims arising out of construction or demolition operations when working within 50 feet of railroad track;
- personal injury and advertising injury liability;
- extended bodily injury coverage with respect to bodily injury resulting from the use of reasonable force to protect persons or property;
- medical payments coverage;
- broad form property damage liability coverage, including coverage for completed operations;
- explosion, collapse, and underground property damage (XCU);
- construction means and methods;
- independent contractors;

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Owner and other's identified herein as additional insured to be specifically evidenced as additional insureds via ISO Endorsements GC 2010 and CG 2037.

§11.1.1.3 Owners Contractors Protective (OCP) Insurance for projects less than or equal to $1,000,000 and/or on 1 story (10 feet) only; $1,000,000 per occurrence, $2,000,000 aggregate with the Owner as the name insured.

For Projects greater than $1,000,000 and/or work over 1 story (10 feet); $2,000,000 per occurrence, $4,000,000 aggregate with the Owner as the named insured.

The OCP Policy must be with a NYS licensed and admitted carrier.

The Owner will be the Named Insured on OCP Policies. There will be no Additional Insureds on any OCP Policies.

§11.1.1.4 Automobile Liability Insurance, including uninsured/underinsured and medical payment protection, and including all owned, non-owned and hired autos, with a limit of liability of not less than $1,000,000 each occurrence (combined single limit for personal injury, including bodily injury or death, and property damage).

§11.1.1.5 Umbrella/Excess Insurance, providing excess coverage in excess of the limits for the insurance coverages required by Sections 11.1.1.1, 11.1.1.2, and 11.1.1.3 above, with such excess/umbrella coverage being at least as broad as each and every one of the underlying policies), with the provision that coverage shall extend for a period of at least two (2) years from the date of final completion and acceptance by Owner of all Work.

$5,000,000 each Occurrence and Aggregate for general construction and no work at elevation (1 story or 10 feet) and project values less than or equal to $1,000,000.

$10,000,000 each Occurrence and Aggregate for high-risk construction, work at elevation (>1 story or 10 feet) and project values greater than $1,000,000.

Umbrella/Excess coverage shall be on a follow-form basis or provide broader coverage over the General Liability and Auto Liability coverages.

§ 11.1.2 All insurance shall be written on an occurrence basis. A copy of the additional insured endorsement shall be attached.

§ 11.1.3 Contractor's insurance requirements shall be provided by an insurance carrier licensed to do business in the State of New York and have an A.M. Best Rating of A(-)8 or better as determine in the most recent A.M. Best Publication, or as may otherwise be agreed by Owner.

§ 11.1.4 Insurance coverage to be provided by the Contractor shall state that the Contractor's coverage shall be "primary" and non-contributing to any insurances (or self-insurance), including any deductible, maintained by, or provided to Owner or the other Additional Insureds; and shall contain a Waiver of Subrogation in favor of Owner and the other Additional Insureds, so that in no event shall the insurance carriers have any right of recovery against Owner, the other Additional Insureds, or the agents or employees or either of them; and shall contain a separation of insured provision (severability of interest clause). If the Owner or another Additional Insured has other insurance which is applicable to the loss, such other insurance shall be on an excess or contingent basis.

§ 11.1.5 In the event that any of the insurance coverage to be provided by the Contractor contains a deductible or self-insured retention, the Contractor shall indemnify and hold the Owner, and any Additional Insured harmless from the payment of such deductible, which deductible shall in all circumstances remain the sole obligation and expense of the Contractor.

§ 11.1.6 The Contractor shall require all Subcontractors to carry the same insurance coverage's and limits of liability as set forth herein and submit same to the Owner through the Construction Manager and obtain approval prior to start of any Work. This includes an OCP policy. To facilitate the review process, the Contractor shall submit the Subcontractors insurance a minimum of 4 weeks before they are scheduled to start work on site. In the event

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Contractor fails to obtain the required certificates of insurance from Subcontractor and prove them to Construction Manager and a claim is made or suffered, the Contractor shall, to the fullest extent permitted by law, indemnify, defend, and hold harmless the Owner and the Additional Insureds 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 Documents and shall survive the term or earlier termination of the Contract.

§ 11.1.7 Environmental Impairment Liability (Pollution Insurance) (EIL): All Contractors and Subcontractors involved with the removal and/or abatement of pollutants (including but not limited to asbestos abatement contractors, lead abatement contractors, roofing contractors, tank removal contractors) are required to maintain a minimum of $2,000,000 EIL coverage. Owner and all other parties required by this Contract to be Additional Insured and all others identified by Owner as such, shall be included as Additional Insured on any EIL policy on a primary and non-contributing basis.

§ 11.1.8 The Contractor assumes responsibility for all injury or destruction of the Contractor's and Subcontractors' materials, tools, machinery, equipment, appliances, shoring, scaffolding, and personal property of Contractor's and Subcontractors' employees from whatever cause arises. Any policy of insurance secured covering the Contractor's or Subcontractors' property 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.

§ 11.1.9 Additional Insured/Certificate Holder. The Contractor shall cause the commercial liability and other coverage required by the Contract to include the following as Additional Insureds:

- Newburgh Enlarged City School District;
- Members of the Board of the Newburgh Enlarged City School District;
- Jacobs Project Management
- Collins+Scoville Architecture | Engineering | Construction Management, D.P.C., d/b/a CSArch ; and
- Any directors, partners, members, shareholders, officers, employees, successors, assigns, heirs, affiliates, agents, and representatives of each and any of the foregoing.

Contractor shall also add any other entities and/or individuals as may be required by Owner as Additional Insured.

The certificate holder shall be Newburgh Enlarged City School District unless Owner requires otherwise.

Contractor shall provide an Additional Insured endorsement that expressly names each of the above identified Additional Insureds (non-blanket) and shall ensure that the endorsement does not include language that requires an Additional Insured to have a written contract with the named insured for coverage to apply.

Additional insured status shall be provided by standard or other endorsements that extend coverage to the District/BOCES for on-going operations (CG 20 38) and products and completed operations (CG 20 37). The decision to accept an endorsement rest solely with the District/BOCES. A completed copy of the endorsements must be attached to the Certificate of Insurance

§ 11.1.10 Certificates of insurance acceptable to the Construction Manager and Owner shall be provided to the Construction Manager and filed with the Owner prior to commencement of the Work. A fully completed New York Construction Certificate of Liability Insurance Addendum (ACORD 855 2014/15) must be included with the certificates of insurance. The certificates and the insurance policies shall contain a provision that coverages afforded under the policies will not be allowed to be materially changed or canceled or allowed to expire until at least thirty (30) days' prior written notice has been given to the Owner via Certified/Registered Mail. If any of the foregoing insurance coverages are required to remain in force after final payment, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

§ 11.1.11 The Contractor acknowledges that its failure to obtain or keep current the required insurance coverage shall constitute a material breach of contract and subjects the Contractor to liability for damages the Owner (or others, including without limitation the other Additional Insured) sustains as a result of such breach. In addition, the Contractor shall be responsible to the fullest extent permitted by law for the indemnification to the Owner and all

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Additional Insured of any and all costs associated with such lapse in coverage, including but not limited to reasonable attorneys' fees (and this indemnification obligation shall survive the term or earlier termination of the Contract).

§ 11.1.12 The amount of insurance required by the Contract shall not be construed to be a limitation of the liability of on the part of the Contractor or any of its Subcontractors.

§ 11.1.13 No act or omission of any insurance agent, broker, or insurance company representative shall relieve Contractor of any of its obligations under this Contract.

§ 11.1.14 Notwithstanding anything in Section 11.3 and its subsections to the contrary, 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 on a full replacement cost basis. The Contractor is responsible for all deductible amounts.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.54 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice directly to the Owner, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.1.65 MISCELLANEOUS PROVISIONS

§ 11.1.65.2 In addition to the above, Contractor will also satisfy any insurance required by any governmental authority.

§ 11.1.65.3 Each insurance certificate will have the following entities listed as "named insured" or "additional insured": Contractor, Owner (full name), Collins+Scoville Architecture | Engineering |Construction Management, D.P.C. (dba CSArch Architecture | Engineering | Construction Management), and all of their employees and CSArch's consultants and all of their employees. Listing the above entities as "certificate holder" is NOT acceptable.

§ 11.1.65.4 Two (2) certificates of insurance shall be submitted to, and reviewed by, the Owner prior to start of construction. If the Owner is damaged or subject to loss due to failure of the Contractor to obtain and maintain such insurance, then the Contractor shall bear all cost and responsibilities attributable thereto.

§ 11.1.65.5 Certificates shall be accompanied by a statement of any deductibles, self-insured retentions and exclusion in the policy, including endorsements affecting the coverage for additional insureds.

§ 11.1.65.6 The Contractor shall exhibit any and all policies within three (3) days if demanded by the Owner, Construction Manager or Architect.

§ 11.1.65.7 This insurance must be purchased from a New York State licensed, A.M. Best Rated "A-", "A", or "A+" carrier., and

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~~§ 11.1.65.8 A copy of the requirements for insurance set forth herein shall be forwarded by the Contractor to the Contractor's insurance carrier to ensure that required coverage is provided.~~

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

11.2.1.1 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 the Contract Documents 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.

§ 11.2.1.2 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.

§ 11.2.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles, unless the underlying loss is caused in whole or in part by Contractor or any of its Subcontractors or anyone for whom either of them are responsible, then, the Contractor shall pay such costs of deductibles.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform both the Contractor and the Construction Manager, separately and in writing, prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice directly to the Contractor, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

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§ 11.3 Waivers of Subrogation

§ 11.3.1 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; (2) the Construction Manager and Construction Manager's consultants; (3) the Architect and Architect's consultants; (4) other Contractors and any of their subcontractors, sub-subcontractors, agents, and employees; and (5) Separate Contractors, 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 those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Construction Manager, Construction Manager's consultants, Architect, Architect's consultants, other Contractors, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this Section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.1.1 Owner and Contractor intend that any policies provided in response to the insurance provisions shall protect all of the parties insured and provide primary coverage for losses and damages caused by perils covered thereby. Accordingly, all such policies shall contain provisions to the effect that in the event of payment for loss or damage, the insurer will have no right of recovery against any of the parties named as insureds or additional insureds.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at 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, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor, Architect, and Construction Manager for loss of use of the Owner's property, due to fire or other hazards however caused.

§ 11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement 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 11.5.2. The Owner shall pay the Construction Manager, Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Construction Manager, Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15.

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Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

§ 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.

§ 11.4.1.1 The Contractor shall furnish bonds covering faithful performance of the contract and payment of obligations arising thereunder. The value of each bond shall be for one-hundred percent (100%) of the Contract Sum and shall be adjusted during the Project construction period to reflect changes in the Contract Sum. Bonds shall be issued by a bonding company licensed in the State of New York, on AIA Document A312, Performance and Payment Bond.

§ 11.4.1.2 Contractor shall deliver bonds in conjunction with executed Agreement and they shall be dated the same date as Agreement.

§ 11.4.1.3 The attorney in fact who executes the required bonds on behalf of the surety, shall affix thereto a certified and current copy of the power of attorney.

§ 11.4.1.4 Status Reports issued by a Bonding Company shall be sent to and completed by the Owner and then returned to the Bonding Company by the Owner.

§ 11.4.1.5 Any additional cost for bonding premium shall not be itemized within individual Change Orders. Adjustments for Contractor's bonding cost shall be adjusted at the end of the Project based on approved executed changes in the Work and the Bonding Company's final adjusted premium at project closeout.

§ 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 examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Construction Manager or Architect has not specifically requested to examine 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, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before 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, discovered before 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 any applicable special warranty required by the Contract Documents,

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any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The 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, Construction Manager or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work 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.

§ 12.2.3.1 Upon request by the Owner and prior to expiration of one year from the date of Substantial Completion, the Construction Manager and the Architect will conduct and the Contractor shall attend a meeting with the Owner to review the facility operations and performance.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner, Separate Contractors, or other Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 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. The parties expressly agree that any claim, dispute or other controversy of any nature arising out of the Contract or performance of the Work shall be commenced and maintained in New York State Supreme Court located in ~~Schenectady~~ Orange~~Albany~~ County.

§ 13.1.2 The Contractor shall at all times observe and comply with all Federal and State Laws, and all Laws, Ordinances and Regulations of the Owner, in any manner affecting the work, and all such orders decreed as exist at present and those which may be enacted later, by bodies or tribunals having jurisdiction or authority over the Work, and the Contractor shall defend, indemnify and save harmless the Owner, Construction Manager and Architect and all ~~its~~their officers, agents or servants against any claim or liability arising from, or based on, a violation of any such law, ordinances, regulation or order, whether by himself or by his employee or agents.

§ 13.1.3 The Contractor specifically agrees as required by Labor Law, Sections 220 and 220-d, as amended that:

1. No laborer, workman or mechanic in the employ of the Contractor, subcontractor or other person doing contracting or contracting to do the whole or any part of the work contemplated by the Contract, shall

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be permitted or required to work more than eight hours in one calendar day or more than five days in one week, except in the emergencies set forth in the Labor Law.

2. The wages paid for a legal day's work shall not be less than the prevailing rate of wages as defined by law, and
3. The minimum hourly rate of wages to be paid shall not be less than that stated in the Specifications, and any re-determination of the prevailing rate of wages after the Contract is approved shall be deemed to be incorporated herein by reference as of the effective date of re-determination and shall form a part of this Contract. The Labor Law provides that the Contract may be forfeited and no sum paid for any work done thereunder on a second conviction of willfully paying less than:
   a. the stipulated wage scale as provided in Labor Law, Section 220, Sub-division 3, as amended; or
   b. the stipulated minimum hourly wage scale as provided in Labor Law, 220-d, as amended.

§ 13.1.4 The Contractor specifically agrees as required by the provisions of Labor Law, Section 220-e, as amended that:

1. In hiring of employees for the performance of work under this Contract or any subcontract hereunder or for the manufacture, sale, or distribution of materials, equipment or supplies, hereunder, no Contractor or Subcontractor nor any person acting on behalf of such Contractor or Subcontractor, 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.
2. No Contractor, Subcontractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee under this Contract on account of race, creed, color, disability, sex, or national origin.
3. There may be deducted from the amount payable to the Contractor by the Owner under this Contract, a penalty of fifty dollars ($50) for each person for each calendar day during which such a person was discriminated against or intimidated in violation of the provisions of the Contract, and
4. The provisions of this section covering every Contract for or on behalf of the Owner, the State or a municipality for the manufacture or sale or distribution of materials, equipment or supplies shall be limited to operations performed within the territorial limits of the State of New York.

§ 13.1.5 During the performance of this Contract, the Contractor agrees as follows:

1. The Contractor will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, sexual orientation, military status, sex, disability, predisposing genetic characteristics, marital status, or domestic violence victim status.
2. If directed to do so by the Owner or the State Commissioner of Human Rights, the Contractor will send to each labor union or representative of workers which with the Contractor has or is bound by a collective bargaining or other agreement or understanding, a notice, to be provided by the State Commissioner of Human Rights, advising such labor union or representative of the Contractor's agreement under clauses (1) through (6) (hereinafter called "non-discrimination clauses"). If the Contractor was directed to do so by the Owner as part of the bid or negation of this Contract, the Contractor shall request such labor union or representative to furnish a written statement that such a labor union representative will not discriminate because of age, race, creed, color, national origin, sexual orientation, military status, sex, disability, predisposing genetic characteristics, or marital status, and that such labor union or representative will cooperate, within the limits of its legal contractual authority, in the implementation of the policy and provisions of these non-discrimination clauses and that it consents and agrees that the recruitment, employment and the terms and conditions of employment under this Contract shall be in accordance with the purposes and provision of these non-discrimination clauses. If such labor union or representative fails or refuses to comply with such a request that it furnish such a statement, the Contractor shall promptly notify the Owner and the State Commissioner of Human Rights of such failure or refusal.
3. If directed to do so by the Owner or the Commissioner of Human Rights, the Contractor will post and keep posted in conspicuous places, available to employees and applicants for employment, notices to be provided by the State Commissioner of Human Rights setting forth the substance of provisions of clauses (1) and (2) and such provision of the State's law against discrimination as the State Commissioner of Human Rights shall determine.

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4. The Contractor will state in all solicitations or advertisements for employees placed by or on behalf of the Contractor, that all qualified applicants will be afforded equal employment opportunities without discrimination because of age, race, creed, color, national origin, sexual orientation, military status, sex, disability, predisposing genetic characteristics, marital status, or domestic violence victim status.
5. The Contractor will comply with the provisions of Sections 290-299 of the Executive Law, and with the Civil Rights Law, will furnish all information and reports deemed necessary by the State Commissioner of Human Rights under these non-discrimination clauses and such section of the Executive Law, and will permit access to the Contractor's books, records, and accounts by the Owner, the State Commissioner of Human Rights, the Attorney General and the Industrial Commissioner for the purposes of investigation to ascertain compliance with the non-discrimination clauses and such sections of the Executive Law Civil Rights Law.
6. This Contract may be forthwith cancelled, terminated or suspended, in whole or in part, by the Owner upon the basis of a finding made by the State Commissioner of Human Rights that the Contractor has not complied with the non-discrimination clauses, and that the Contractor may be declared ineligible for future contracts made by or on behalf of the Owner, the State or a public authority or agency of the State, until the Contractor satisfies the State Commissioner of Human Rights that the Contractor has established and is carrying out a program in conformity with the provisions of these non-discrimination clauses. Such findings may be made by the State Commissioner of the Human Rights after conciliation efforts by the Commissioner have failed to achieve compliance with these non-discrimination clauses and after a verified complaint has been filed with the Commissioner, notice thereof has been given to the Contractor to be heard publicly in accordance with the Executive Law. Such sanctions may be imposed and remedies invoked independently of or in addition to sanctions and remedies otherwise provided by law, and
7. The Contractor will include the provisions of clauses .1 through .6 in every subcontract or purchase order in such a manner that such provisions will be binding upon each subcontractor or vendor as to operations to be performed within the State of New York. The Contractor will take action in enforcing such provisions of such subcontract or purchase order as the State Commissioner of Human Rights or the Owner may direct, including sanctions or remedies for non-compliance. If the Contractor becomes involved or is threatened with litigation with a subcontractor or vendor as a result of such directions by the State Commissioner of Human Rights or the Owner, the Contractor shall promptly so notify the Owner and the Attorney General requesting the Attorney General to intervene and protect the interests of the State of New York.

~~The Contract shall be governed by the law of the place where the Project is located excluding that jurisdiction's choice of law rules. 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 an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 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 upon in writing.

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§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. 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 tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Construction Manager, Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Construction Manager 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 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Construction Manager's and Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Construction Manager for transmittal to the Architect.

§ 13.4.5 If the Construction Manager or Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Construction Manager or Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments to Contractor, including any interest, shall be consistent with this Agreement and in accordance with New York State General Municipal Law Section 106-b.

~~Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties 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.~~

§ 13.6 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 and 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.

§13.7 EQUAL OPPORTUNITY

§13.7.1 The Contractor shall maintain policies of employment as follows:

1. he Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor shall take affirmative action to insure that applicants are employed and that employees are treated during employment without regard to their race, religion, color, sex and national origin. Such

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action shall include, but not 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 of training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination, and

2. the Contractor and the Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.

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, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.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, after the Contractor has provided written notice of the lack of certification with a reasonable opportunity to cure, has not notified the Contractor of the reason for withholding certification as provided in Section 9.4, or because the Owner, after the Contractor has provided written notice of the lack of payment with a reasonable opportunity to cure, 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 reasonable evidence as required by Section 2.2.~~

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, 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 thirty~~seven~~ days' notice to the Owner with a reasonable opportunity to cure, Construction Manager and Architect, terminate the Contract and recover from the Owner payment for Work properly executed., ~~as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.~~

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees, or any other persons performing portions of the Work 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 thirty~~seven~~ additional days' 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 or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;

.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.

.5 breaches any warranty made by the Contractor under or pursuant to the Contract Documents.

.6 fails to furnish the Owner with assurances satisfactory to the Owner evidencing the Contractor's ability to complete the Work in compliance with all of the requirements of the Contract Documents."

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§ 14.2.2 When any of the reasons described in Section 14.2.1 exist ~~, after consultation with the Construction Manager, and upon certification by the Architect that sufficient cause exists to justify such action,~~ the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' 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. The costs of finishing the Work include, without limitations, all reasonable attorney's fees, additional Architect/Engineering and Construction Manager costs, insurance, additional interest because of any delay in completing the Work, and all other direct and indirect and consequential damages incurred by the Owner by reason of the termination of the Contractors stated herein.

§ 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 may~~shall~~ be adjusted for increases in the cost and time caused by suspension, delay, or interruption under 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 Notwithstanding any other provision to the contrary in this Agreement, the Owner reserves the right at any time and in its absolute discretion to terminate the services of the Contractor and/or the Work for the Owner's convenience and without cause by giving written notice to the Contractor. This termination for the convenience of the Owner provision allows and authorizes the Owner to terminate this Agreement at any time and for any reason whatsoever. This right may be exercised by the Owner in its complete discretion.
~~The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.~~

§ 14.4.2 Upon receipt of 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.

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§ 14.4.3 In the case of such termination for the Owner's convenience, the Contractor shall be entitled to, and the Owner shall reimburse the Contractor for, an equitable portion of the Contractor's fee based on the portion of the Work properly completed before the effective date of termination ~~and for any other reasonable costs attributable to such termination~~. Contractor's entitlement to payment for all such work shall be predicated on its performance of such work in accordance with the Contract Documents as certified by the Architect and Construction Manager. Contractor shall be entitled to no other payment and waives any claim for damages.
~~In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.~~

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, a change in the Contract Time, 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. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents. The Owner may refer a claim to the Construction Manager and or the Architect for their review and assistance; however, such is not required by this Agreement.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the 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 Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2. The provisions of Education Law §3813(2) shall apply to this Agreement.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Construction Manager and Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall 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. The provisions of Education Law §3813(1) shall apply to this Agreement.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.3.3 Claims by the Contractor must be made by written notice in accordance with the following procedures.

.1 the Contractor may submit a claim concerning a matter properly noticed in accordance with the time requirements of this Contract set forth in paragraph 15.1.3 and elsewhere;

.2 failure by the Contractor to furnish the required claim documentation within the time set forth above shall constitute waiver of the Contractor's right to compensation for such claim.

.3 Contractor shall furnish three (3) certified copies of the required claim documentation. The claim documentation shall be complete when furnished. The evaluation of the Contractor's claim will be based, among other things, upon the Owner's Project Records and the Contractor's furnished claim documentation

.4 claim documentation shall conform to Generally Accepted Accounting Principles and shall be in the following format:

a. general introduction;
b. general background discussion
c. issues
   i. index of issues (listed numerically);

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ii. for each issue:
(1) background
(2) chronology
(3) Contractor's position (reason for Owner's potential liability)
(4) supporting documentation of merit or entitlement
(5) supporting documentation of damages
(6) begin each issue on a new page

d. all critical path method schedules (as-planned, monthly updates, schedule revisions and as-built, along with computer disks of all schedules related to the claim;

e. productivity exhibits (if appropriate); and

f. summary of issues and damages.

.5 supporting documentation of merit for each issue shall be cited by reference, photocopies or explanation. Supporting documentation may include, but shall not be limited to General Conditions, General Requirements, technical specifications, drawings, correspondence, conference notes, shop drawings and submittals, shop drawing logs, survey books, inspection reports, delivery schedules, test reports, daily reports, subcontracts, fragmentary CPM schedules or time impact analyses, photographs, technical reports, requests for information, field instructions and all other related records necessary to support the Contractor's claim.

.6 supporting documentation of damages for each issue shall be cited, photocopied or explained. Supporting documentation may include, but shall not be limited to, any or all documents related to the preparation and submission of the bid; certified, detailed labor records including labor distribution reports; material and equipment procurement records; construction equipment ownership, cost records or rental records; subcontractor or vendor files and cost records; service cost records; purchase orders; invoices; Project as-planned and as-built cost records; general ledger records; variance reports; accounting adjustment records, and any other accounting material necessary to support the Contractor's claims.

.7 each copy of the claim documentation shall be certified by a responsible officer of the Contractor in accordance with the requirements of these Contract Documents.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 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.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost. If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 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.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

§ 15.1.6.3 Claims for increase in the Contract time shall set forth in detail the circumstances that form the basis for the Claim, the date upon which each cause of delay began to affect the progress of Work, the date upon which each cause of delay ceased to affect the progress of the Work and the number of days increased in the Contract time claimed as a consequence of each such cause of delay. The Contractor shall provide such supporting documentation

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as the Owner may require including, where appropriate, a revised construction schedule indicating all the activities affected by the circumstances forming the basis of the Claim.

§ 15.1.6.4 The Contractor shall not be entitled to a separate increase in the Contract time for each one of the number of causes of delay which may have concurrent or interrelated effects on the progress of the Work, or for concurrent delays due to the fault of the Contractor.

§ 15.1.7 Waiver of 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.

§15.1.8.12 Claims and Actions Thereon. No claim against the Owner for damages for breach of contract or compensation for extra work shall be made or asserted in any action or proceeding at law, or in equity, unless the Contractor shall have strictly complied with all the requirements relating to the giving of notice and of information with respect to such claims all as provided in this Agreement.

§15.1.8.23 No Estoppel. Neither the Owner nor any department officer, agent or employees thereof, shall be bound, precluded or estopped by any determination, decision, approval, order, letter, payment or certificate made or given under or in connection with this Contract by the Owner, or any officer, agent or employee of the Owner, either before or after the final completion and acceptance of the Work and payment therefor: (1) from showing the true and correct classification, amount, quality or character of the Work actually done; or that any such termination, decision, order, letter, payment or certificate was untrue, incorrect or improperly made in any particular matter, or that the Work or any part thereof does not in fact conform to the requirements of this Contract; or (2) from demanding and recovering from the Contractor any overpayments made to him, or such damages as it may sustain by reason of his failure to perform each and every part of this Contract in strict accordance with its terms; or (3) both (1) and (2) hereto."

~~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 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.~~

§ 15.2 Initial Decision

§ 15.2.1 Claims, by the Contractor, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim by the Contractor against the Owner. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ~~ten~~ twenty one 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.

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§ 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~~Contractor to furnish additional supporting data, ~~such party shall respond,~~the Contractor shall respond, within ten days after receipt of the 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 If a Claim has not been resolved after consideration of the foregoing and of further evidence presented by the parties or requested by the Architect, the Architect will render to the parties the Architect's written recommendation relative to the Claim, including any recommended change in the Contract Sum or Contract Time or both. If there is a surety and there appears to be a possibility of a Contractor's default, the Architect may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.~~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, the Construction Manager, and the Architect, if the Architect 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 receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days of receipt thereof, 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.

§ 15.2.9 Nothing contained in this Agreement is intended to alter or replace any provisions of the laws of the state of New York relating to claims made against the Owner or to relieve Contractor from any obligations thereunder.

§ 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 15.1.7, 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, Mmediation 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~~

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~~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.~~

~~§ 15.3.4 **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.**~~**Omitted**

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§ 15.4 Arbitration

§ 15.4.1 The parties expressly agree to **delete** the requirement that any and all controversies and claims arising out of the contract be referred to arbitration. By so agreeing, the parties express their mutual intent that there is **no agreement** to arbitrate such disputes, notwithstanding the use and reference to arbitration elsewhere in the contract documents."

~~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. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. 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.~~

§ 15.5 The parties expressly agree that any claim, dispute, or other controversy of any nature arising out of the contract or performance of the work shall be commenced and maintained in New York State Supreme Court located in ~~Schenectady~~ ~~Albany~~Orange County.

~~**§ 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** Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party 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** Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party 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 those of the Owner and Contractor under this Agreement.~~

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SECTION 00 73 46 - PREVAILING WAGE RATES

PART 1 - GENERAL

1.1 GENERAL

A. The wage schedule can be obtained from the New York State Department of Labor prior to bid. The NYS prevailing wage rate schedule for this project can be obtained at the following WEB link:

1. NYSDOL PRC#: 2024014056
2. NYSDOL - Prevailing Wages (View PRC)

B. The Contractor shall be responsible for completing one copy of the form PW-16, the identification number is in small print and is located in the bottom left corner of the form, enclosed as part of the prevailing wage rate package. Leave the "CONTRACTS NOT YET AWARDED" section blank. Upon completion, the contractor shall mail the form to the architect for record keeping and for forwarding on to the New York State Department of Labor.

REQUIREMENTS OF ARTICLE 8 (SECTION 220-223) OF THE NEW YORK STATE LABOR LAW

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 007346

SECTION 008200 - STATUTORY REQUIREMENTS

1.01 Pursuant to the Requirements of the New York State Labor Law, the following conditions and stipulations shall be included within the Contract, and shall form a part of the Contract Documents:

A. No laborer, workman or mechanic in the employ of the Contractor, Subcontractor or other person doing or contracting to do the whole or a part of the work contemplated by the Contract shall be permitted or required to work more than eight (8) hours in any one (1) calendar day or more than five (5) days in any one (1) week except in cases of extraordinary emergency including fire, flood or danger to life or property.

B. Each laborer, workman or mechanic, employed by the Contractor, Subcontractor or other person about or upon the work shall be paid the wages herein provided.

C. Each laborer, workman or mechanic, employed by the Contractor, Subcontractor or other person about or upon the work shall be provided the supplements as required by Article 220 of the New York State Labor Law.

D. The following Wage Rate Schedule contains the minimum hourly rate of wage which can be paid and the minimum supplement that can be provided, as has been designated by the Industrial Commissioner, to the laborers, working men or mechanics, employed in the performance of the Contract, either by Contractor, Subcontractor of the person doing or contracting to do the whole or part of the work contemplated by the Contract. Such laborers, workingmen or mechanics shall be paid not less than such hourly minimum rate of wage and provided supplements not less than the prevailing supplements.

E. In the hiring of employees for the performance of work under this Contract or any Subcontract hereunder, no Contractor, Subcontractor, nor any person acting on behalf of such Contractor or Subcontractor, shall by reason of race, creed, color 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.

F. No Contractor, Subcontractor, nor any person on his behalf shall in any manner, discriminate against or intimidate any employee hired for the performance of work under this Contract on account of race, creed, color or national origin.

G. There may be deducted from the amount payable to the Contractor by Owner under this Contract a penalty of Five Dollars ($5.00) for each person for each calendar day during which such person was discriminated against or intimidated in violation of the provisions of the Contract.

H. This Contract may be canceled or terminated by Owner, and all money due or to become due hereunder may be forfeited, for a second or subsequent violation of the terms or conditions of this section of the Contract.

I. The aforesaid provisions of this section covering every Contract for or on behalf of the State or municipality for the manufacture, sale or distribution of materials, equipment or supplies shall be limited to operations performed within the territorial limits of the State of New York.

J. Preference in employment shall be given to citizens of the State of New York who have been residents for at least six (6) consecutive months immediately prior to the commencement of their employment. Persons other than citizens of the State of New York may be employed when such citizens are not available. If the Requirements of Section 222 concerning preference in employment to citizens of the State of New York are not complied with, this Contract shall be void.

K. If a harmful dust hazard is created for which appliances or methods for the elimination of harmful dust have been approved by the Board of Standards and Appeals, such appliances or methods shall be installed and maintained and effectively operated by the Contractor. If the provisions of Section 222-a concerning harmful dust hazards are not complied with, the Contract shall be void.

L. It is hereby agreed by and between the parties hereto that every Contractor and Subcontractor engaged in the public work described in this Contract shall post and maintain, at each of his establishments and at all places at which the public work described hereunder is being conducted, the Notice of the State Commission Against Discrimination indicating the substantive provision of the Law Against Discrimination, where complaints may be filed, and other pertinent information. Such Notice shall be posted in easily accessible and well-lighted places customarily frequented by employees and applicants for employment.

M. Requirements for OSHA 10 Compliance – Chapter 282 of the Laws of 2007 as Labor Law 220-h that have taken effect on July 18, 2008. The statute provides as follows:
The advertised specifications for every contract for public work of $ 250,000.00 or more must contain a provision requiring 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 receive such training “prior to performing any work on the project”.

All contractors and sub-contractors shall 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 in accordance with the Bureau enforcement of the above referenced statute.

Proof of completion may include but is not limited to:
1. Copies of bona fide course completion card.
2. Training roster, attendance record of other documentation from the certified trainer pending issuance of the card.
3. Other valid proof.

** Note – A certification by the employer attesting that all employees have completed such 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 518-485-5696.

END OF SECTION 000820

SECTION 008300 - SED COMMISSION'S 155.5 REGULATIONS

PART 1 - GENERAL

1.01 Uniform Safety Standards for School Construction and Maintenance Projects:

A. The occupied portion of any school building shall always comply with the minimum requirements necessary to maintain a Certificate of Occupancy.

B. All school areas to be disturbed during renovation or demolition have been tested for lead and asbestos by the School District. Contractors may obtain a copy of test results from the School District.

C. All construction materials shall be stored in a safe and secure manner. Coordinate locations with the School District's project representative.

D. Fences around construction supplies or debris shall be maintained.

E. Gates shall always be locked unless a worker is in attendance to prevent unauthorized entry.

F. During exterior renovation work, overhead protection shall be provided for any sidewalks or areas immediately beneath the work site or such areas shall be fenced off and provided with warning signs to prevent entry.

G. Workers shall be required to wear photo-identification badges at all times for identification and security purposes while working at occupied sites. Contractors shall provide each worker in their employ with photo-identification badges approved by the School District.

H. 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. Provisions shall be made to prevent the passage of dust and contaminants into occupied parts of the building. Periodic inspection and repairs of the containment barriers must be made to prevent exposure to dust or contaminants. Gypsum board must be used in exit ways or other areas that require fire rated separation. Heavy-duty plastic sheeting may be used only for a vapor, fine dust or air infiltration barrier, and shall not be used to separate occupied spaces from construction areas.

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 by each contractor working in that area 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.

I. All existing exits shall be maintained throughout the project.

J. All existing ventilation systems shall be maintained throughout the project.

K. 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 abatement measures shall be taken.

L. Each contractor shall be responsible for the control of chemical fumes, gases, 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.

M. Each contractor shall be responsible to 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 manufacturers recommendations before a space can be occupied.

N. Large and small asbestos abatement projects as defined by 12NYCRR56 shall not be performed while the building is occupied. The term "building", as referenced in this section, means a wing or section of a building that can be completely isolated from the rest of the building, including exits and ventilation systems, with sealed non-combustible construction.

O. All asbestos abatement projects shall comply with all applicable Federal and State laws including but not limited to New York State Department of Labor Industrial Code Rule 56 (12NYCRR56) and the Federal Asbestos Hazard Emergency Response Act (AHERA), 90 CFR Part 763 1998 Edition. Final clearance shall be by T.E.M. air monitoring.

P. All lead based paint abatement shall comply with protocols detailed in the guidelines for evaluation and control of lead based paint hazards in housing (June 1995, U.S. Department of Housing and Urban Development, Washington, DC 20410).

END OF SECTION 008300

Request for Shutdown

PROJECT Newburgh Enlarged City School District – Gidney Avenue Memorial School, Meadow Hill Gem School, Temple Hill Academy	**DATE:**
	CONTRACT No.
Project No. 2233600	**CONTRACT FOR:**

CONTRACTOR REQUEST		
Contractor Name:		
Foreman:	Emergency Phone:	
Type:		
Area Affected:		
Reason for Shutdown:		
1. Date Requested:	From Time:	To Time:
2. Date Requested:	From Time:	To Time:
3. Date Requested:	From Time:	To Time:
4. Date Requested:	From Time:	To Time:
Send to: LaBella, ATTN:		
OWNER'S REMARKS		
Owner's Remarks:		
Owner's Signature of Approval:		Date:

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Daily Report Cover

PROJECT:	Newburgh Enlarged City School District – Gidney Avenue Memorial School, Meadow Hill Gem School, Temple Hill Academy	**DATE:**	
		CONTRACT NO.	
CSARCH PROJECT NO. 2233600		**CONTRACT FOR:**	

	7:00 a.m.	Noon	3:30 p.m.
Temperature			
Weather			

PERSONNEL (list by trade or attach daily time sheet)

SUBCONTRACTORS / PERSONNEL

EQUIPMENT

Send to: LABELLA

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Two Week Look-Ahead Schedule

PROJECT: Newburgh Enlarged City School District – District Wide A/C – Electrical Upgrades	**DATE:**
Project No. 2233600	**CONTRACT No.**
	WORK AREA:

DATES	Enter Day of Week	Enter Day of Week	Enter Day of Week	Enter Day of Week	Enter Day of Week	Enter Day of Week	Enter Day of Week	Enter Day of Week	**COMMENTS/NOTES:**

Send to:

Substantial Completion Request for Inspection

PROJECT Newburgh Enlarged City School District District Wide A/C – Electrical Upgrades	**DATE:**
	CONTRACTOR:
CSARCH PROJECT No. 2233600	**CONTRACT No.**
	AREA:

DIRECTIONS:

- The Contractor has verified that installations and finishes are complete and installed per the Contract, and that the items listed below are outstanding and will be completed as agreed upon with the Architect and Owner.
- Upon verification of report by the Construction Site Representative, the Architect shall inspect and issue a Punch List.

Contract Supervisor's Signature:	Date:
Construction Site Representative Signature:	Date:

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SECTION 011200 – MULTIPLE PRIMES SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including the General and Supplemental Conditions and Division 1 Specification Section, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Construction schedule.
4. Requirements and assignments for each Contract.
5. Owner-furnished products.
6. Access to GC.
7. Coordination with occupants.
8. Work restrictions.

B. Section includes a summary of each contract, including responsibilities for coordination and temporary facilities and controls.

C. Each Contractor is responsible for reviewing all Drawings and Specifications for every contract to gain a complete understanding and knowledge of the entire Project, to determine how the work of each contract is to interface with every other contract. One set of Construction Documents is issued covering the Work of multiple Prime Contracts.

D. The Prime Contractor shall provide (1) Full Time experienced Construction Project Manager and (1) Full Time Superintendent, each with a minimum of 5 years of relevant Construction experience.

E. Prime Contractors shall provide resumes of the proposed Full Time Project Manager and Full Time Superintendent for CM, Architect and Owner approval. Project Manager must have experience on NYS school district construction projects.

DEFINITIONS

A. Project Identification: Project consists of all labor, materials, equipment, appliances, services, and incidentals necessary for layout, installing, and performing Alterations at the Newburgh Enlarged City School District as shown on the Contract Drawings and described in the Specifications.

B. Mechanical upgrades work to start in January of 2025 for Proposition 5 Phase 1 Schools (Gidney Avenue Elementary School, Temple Hill Academy and Meadow Hill GEM School).

C. The work will be constructed under multiple prime contracts. The GC is responsible for communicating, coordinating, and scheduling work with all awarded listed contracts below. One set of contract documents is issued covering multiple contracts. Each Prime Contract is defined as:

1. CONTRACT 1 MC – MECHANICAL/PLUMBING CONSTRUCTION WORK
2. CONTRACT 2 EC – ELECTRICAL CONSTRUCTION WORK
3. CONTRACT 3 GC – GENERAL CONSTRUCTION WORK

B. GC Scope includes the following but not limited to.

1. Interior Building and Exterior Site alterations and working at multiple schools on 2nd shift after school, weekends and non PLA holidays. Refer to the PLA for shift-work schedules.
   The gym and cafeteria walls at Temple Hill Academy and Meadow Hill GEM School have lead so if the contractor is drilling into walls, they need protective gear and hepa vac attachment on the drill.
2. All abatement will start as soon as school lets out June 27, 2025. Notification should go out 10 days before work starts. advanced notice to the CM, Architect and District, proper coordination and containment and performed at multiple schools after school, weekends, and non PLA holidays to meet the required project completion schedule.
3. GC is responsible for furnishing and installing all steel lintels related to any other Prime Contractors work.
4. GC shall include all work associated with concrete and provide cold weather concrete applications as required.
5. Abatement/GC/roofing/site work will be covered in the General Construction Scope and contract. Abatement will be priced as an deduct alternate.
6. This project is to be bid based on work being performed during the school year of 2025 as well as the summer of 2025. Work is to be specifically performed during weekends, evenings, school holidays, and summer work. It will be at the owner's discretion if work can be performed during normal working hours known as 7 AM through 3:30 PM. All shift work per the PLA agreement here in this contract.
   While School is in session the following No Fly times must be adhered to with no exceptions. Both Meadow Hill GEM School and Temple Hill Academy will have no fly times of – 7:30 AM to 9:00 AM in the mornings and 3:00 PM to 4:00 PM in the afternoons. Gidney Avenue Elementary School will have no fly times of 7:30AM to 10:00AM in the morning and 3PM to 4:30PM in the afternoons. There are to be no deliveries allowed, construction vehicles or any other construction activities happening during these times for the course of the project outside the construction site fence on the streets that surround the school property.

C. Architect Identification: The Contract Documents were prepared for the Project by **Labella**.
D. Construction Manager: **Jacobs Project Management** has been engaged as Construction Manager for this Project to serve as an advisor to Owner and to aid in administering the Contract for Construction between Owner and Contractor, according to a separate contract between Owner and Construction Manager.
E. Building Code in Effect for Project: 2020 NYS Building Code, Electrical Code, Mechanical Code and Local Fire Marshall requirements.

F. Comply with the following: New York State building Code and the building standards of the New York State Education Department.

1.3 THE CONTRACT

A. The Project will be constructed under a multiple prime contracting arrangement with the Owner awarding and holding separate Contracts. Each contractor shall furnish all labor, material, tools, equipment, supervision, layout, delivery, trucking, shop drawings, submittals, etc. necessary to complete the work described in the Divisions of Work of their respective divisions (Including where coordination between primes occurs) Contracts are based upon a complete set of Contract Documents.

B. Each Contractor has been given the opportunity prior to bidding to inspect the entire Project for references to their Contract work and agrees to accept as it exists on the date of the bid opening.

1. It is the Owner's intention to continue to occupy the existing buildings for normal School operations during the construction process. The Contractors all agree to:

a) Cooperate with the Owner’s personnel in maintaining and facilitating access to the school buildings and its facilities by the school staff, Students, Owner’s agents, service consultants, and the public, throughout the construction process.

b) Keep driveways and entrances serving the occupied School buildings clear and available to the Owner, the Owner’s employees, the public, and to emergency vehicles always. Do not obstruct access to, or use these areas for parking, staging of equipment or materials. All-access through these existing areas must be coordinated in advance and in accordance with the Owner’s usage and occupancy schedule. Additionally, contractors are responsible for providing their own storage containers on-site for material storage. The location for placement of storage containers is to be coordinated through the Construction Manager and approved by the school district. During school hours, no Contractors will be allowed to use district parking lots.

c) Schedule construction operations to minimize any conflicts or interruptions to the daily school functions. Coordinate any necessary interruptions with the designated project representative.

d) All existing Owner-occupied areas of buildings (not turned over to the Project Contractors) need to always remain operational. The contractors are responsible for maintaining all systems, such as but not limited to: fire alarm, clocks, electric, public address system, gas service, heat, security, data, etc. No old equipment to be removed without the replacement of the new equipment being operational.

e) Each Prime Contractor and their Subcontractors shall provide a list of potential and all employees that will require access to these schools within this contract. This list of employees will be checked through the NECSD Raptor System. Failure to provide this list of employees to the Construction Manager within a min. of 48 hrs in advance prior to site visit will result in the Prime Contractor or their subcontractors delay of access to the Project Site. Confirmation of acceptance must be provided by the district and sent to the

Contractor before work can start. Contractors should be wearing PPE with company name and once raptor cleared to display raptor sticker on hard hat.

f) Each contractor will provide sign in sheets of their respective manpower to the CM Daily.

C. Each Prime Contractor shall:

1. Be responsible for creating a schedule and coordinating with the general contractor to incorporate their activities into the general contractor's master project milestone schedule.
2. Provide reflective vests and all required OSHA-approved PPE to always be worn by all on-site personnel. Parties that do not abide by this requirement will be escorted off the premises.
3. Provide erosion and Sediment Control and dewatering as it relates to any excavation associated with the GC Prime Contract.
4. Provide potable drinking water for its own employees.
5. Provide access to all concealed systems as required for system maintenance and repair for items installed in their Prime Contract. This specifically talks to access panels needed for future maintenance by the district. All access panels to be installed in highly accessible locations and be commonly keyed per District specification.
6. Provide and maintain material lifting equipment required for the completion of their Contract requirements, and complying with NYS Labor Laws, OSHA Regulations, and other Federal, State, and local laws.
7. Provide and maintain additional temporary stairs, ladders, ramps, scaffolding, and platforms required specifically for completion of work of their own Contract, and as further detailed in this section. All work needs to comply with the NYS Labor Laws, OSHA regulation, and other Federal, State, and local laws.
8. Provide Fire Prevention materials and equipment for fire protection related to the work of their own Prime Contract. Provide fire extinguishers, fire blankets, and fire watch during all cutting and welding operations. Protect all existing components like smoke detectors. Fire alarm systems will not be taken offline while the building is occupied by students and faculty.
9. Provide any supplemental lighting required to install the work of its own Contract, beyond the minimum OSHA levels provided under the Electrical Work Prime Contract.
10. Provide any supplemental heat required to install the work of its own Contract when temp heat is needed outside the timeline of interior finishing work.
11. Provide traffic control for deliveries, and equipment needed to perform the work of their own Prime Contract. Access must be coordinated with district building operation schedule.
12. Each prime contractor shall provide protection of its own finished Work, after installation, until accepted by the Owner.
13. Provide fire caulking for any penetration related to the work for its own Prime Contract.
14. Provide any office and storage trailers required to complete the work of their own Prime Contract. Storage containers must be within the staging area and approved by the district. All storage trailers and containers to comply with NYSED requirements.

15. Each Prime Contractor is required to provide temporary protection at areas of work for all trades at the beginning of each work shift and clean each of the areas or rooms where work was performed during shift work at the end of each shift. Work should be cleaned to the specification of the school building custodian, Chief Custodian or Director of Facilities to allow the custodial staff to make the building ready for students and staff the next day.
16. Punchlist for Meadow Hill GEM School and Temple Hill Academy should be broken up into phases. Punchlist and final construction to be complete before August 22, 2025.
17. GC to provide for a thorough final cleaning of the areas affected by the new work and construction activity within the existing building. The GC shall hire a professional cleaning company pre accepted by the district. Professional cleaning will be performed upon final turnover to district and coordinated with the district. Cleaning must be accepted by the district and done to their standards. Each Prime Contractor is responsible for cleaning and dust and debris generated from the work of their own Contract. Maintain areas in a cleaned condition until the Owner occupies the space. All new floors to be cleaned and sealed by the contractor per the manufacturers specification requirements.

1.4 SUMMARY OF WORK

A. The work will be constructed under multiple prime contracts. One set of contract documents is issued covering the multiple contracts. Each Prime Contract is defined as:

1. CONTRACT 1 GC - GENERAL CONSTRUCTION WORK
2. CONTRACT 2 MC - MECHANICAL CONSTRUCTION WORK
3. CONTRACT 3 EC - ELECTRICAL CONSTRUCTION WORK

B. Prop 5 Phase 1– 2019 Capital Improvement Project- The work consists of but not limited to the following:

1. GENERAL CONTRACTOR - Civil work, masonry work, structural steel work, mill work, abatement, removal and replacement of ceiling tiles, painting and patching, masonry, fencing, roofing.
2. MECHANICAL CONTRACTOR - HVAC systems, miscellaneous steel support systems for hanging units, piping, testing, and balancing.
3. ELECTRICAL CONTRACTOR - New panels for new equipment, removal of existing panels, new conduit runs, labelling of all new and existing circuits.

1.5 WORK UNDER SEPARATE CONTRACTS

A. The project will be constructed under a multiple-prime contracting arrangement.
B. One set of documents is issued covering all prime contracts scope of work. Each prime contractor is to review ALL drawings and specifications for complete understanding and knowledge of

the work to be performed by all trades. Any questions of responsibility should be discovered Pre award.

C. The following Contract Documents are specifically included and defined as integral to each Prime Contract.

1. Bidding Requirements
2. Performance and Payment Bonds (with acknowledgement of if any and all Riders)
3. Conditions of the Contract, including
   a. General Conditions & Supplementary Conditions
   b. Insurance Requirements (with insurance acknowledgment affidavit)
   c. NYS Prevailing Wage Rates
   d. Project Labor Agreement

D. Extent of Contract: Unless the Contract Documents contain a more specific description of the work, names, and terminology on Drawings and in Specification Sections determine which contract includes a specific element of Project.

1. Unless otherwise indicated, the Work described in this Section for each contract shall be complete systems and assemblies, including products, components, accessories, and installation required by the Contract Documents.
2. The GC shall provide all trenching and backfilling for all new electrical and mechanical piping related to this contract.
3. All Concrete Work inside/outside the building footprint shall be provided by the GC, unless specifically assigned to another Contract.
4. Each prime contractor is responsible for all cutting, core drilling and patching associated with its own work. All patching is to be performed by mechanics qualified and experienced with the materials and finishes being patched and hired by the responsible Prime Contractor under the PLA. New openings requiring structural reinforcing including lintels for all trades will be the responsibility of the General construction contract. MC shall coordinate with the GC in providing opening sizes within the existing masonry with new steel lintels with the GC. Coordinate with shop drawings and/or lintel schedule for opening size requirements.
5. Each contractor is responsible for lead based paint precautions per OSHA requirements.
6. Each Prime Contractor shall designate a full-time superintendent to supervise the work of the Prime Contractor, who shall always be present on the job site when work is being performed; this person shall be familiar with Project and authorized to conclude matters relating to progress. This person shall also represent their company at weekly contractor meetings.
7. Termination and removal of its temporary facilities shall be provided by each contract for its own Work.
8. The Electrical Contractor shall provide temporary power and lighting if needed.
9. Temp Heat for any existing spaces that have not been completed with the new units. Electrical contractor to provide temp power to temp mechanical heating equipment.

E. **Temporary Facilities and Controls:** **In addition to** specific responsibilities for temporary facilities and controls indicated in this Section and in Division 1 Section 01 5000 "Temporary Facilities and Controls," each Contract is responsible for the following:

1. Installation, operation, maintenance, and removal of each temporary facility usually considered as its own normal construction activity, and costs and use charges associated with each facility.
2. Generators, plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
3. Each Prime Contractor is to stockpile their debris on a daily basis and place it in the dumpster. The general disposal dumpsters will be provided by the General Construction contract for use by the Prime contractors, recycling of materials will be instituted daily. Large mechanical equipment to be removed by the Mechanical Contractor, including but not limited to unit ventilators, fan room equipment, large air handling units, roof top units, etc. Waste disposal facilities, including collection and legal disposal of its own hazardous, dangerous, unsanitary, or other harmful waste materials will be by the Hazardous Material Abatement sub-Contractor under the GC contract – Waste Manifest for all Abatement Containing Materials is to be submitted upon Closeout of the Project. Abatement to be priced as an deduct alternate.
4. Secure lockup of its own tools, materials, and equipment.
5. Safety procedures as dictated by the district, OSHA, and the NYS Department of Labor.
6. Labor for daily clean-up.
7. General Contractor to include Temp site fence around areas of work at the site as directed by the CM and shown on the logistics plan. Fence will be removed when work is complete and signed off by the architect. Fence will be pole driven, not panelized, or at the direction of the Construction Manager. All gates to have locks and chain keyed. Fencing to have wind screen.
8. EC to provide generators for temp power to be used by all trades until other service from the utility provider or existing building can be established. Include power to the building to keep FA and internet functions powered at all times during a shut down. At no time will building power be interrupted unless scheduled with the district one week in advance. Include fuel and operator to ensure no interruption to required power. The electrical shutdowns at Meadow Hill GEM School and Temple Hill Academy cannot be performed at the same time as the security feeds through a loop.

1.6 CONTRACT 1 - MECHANICAL CONTRACT

A. Work of this Contract includes, but is not limited to, the following descriptions:

1. New mechanical units, piping, connections, and startup. Demolition and removal of old equipment and associated hardware, ductwork, RTU's, balancing, etc...
2. The Mechanical Contactor is responsible for reviewing the complete set of contract documents and coordinating all existing and new HVAC equipment upgrades. The Mechanical Contractor is responsible for providing a complete and fully operational system and in finished condition.
3. All personnel on site shall always have a School badge displayed where visible. If the same individual fails to have the ID a second time they will be removed from the site and not be allowed back on site till they obtain the proper identification. All personnel will be subject to the raptor system check and cleared before enter-

ing the property. All cleared personnel must display their Raptor badge on their hard hat at all times.

B. **Work of this Contract includes**, but is not limited to, the following descriptions:

1. HVAC Equipment, Piping, ductwork, plus other construction operations traditionally recognized as heating, ventilating and cooling work. It also includes Administrative and coordination responsibilities.

2. Coordination:

   a) Coordination with the work of all of the other contractors.
   b) Each trade will participate in producing coordination drawings.
   c) The mechanical, and electrical contractors will overlap their new work and coordinate locations, heights, routes, Etc. to eliminate hits and or obstructions from existing or new work. Each trade will meet once a week to coordinate their drawings. Ductwork and mechanical piping first, and electrical second. A full set of coordination drawings must be completed within **five weeks** after award of contract.

3. Demolition:

   a) Provide demolition of all HVAC equipment and piping as shown and as required at the existing locations. Discard equipment for reinstallation of new equipment as indicated on the drawings.
   b) All cutting and patching necessary for work of this contract, including layout, sleeves, coring, debris removal, saw cuts, drywall work, plaster work, grouting, painting, etc. GC to patch Floors, walls, louvers, Etc.. at the locations needing finish work.
   c) Mechanical contractor responsible for removing and disassembling equipment to remove it from the work area.

4. Temporary Facilities:

   a) Provide Temporary Facilities indicated as Work of this Contract in Division 1 “Temporary Facilities and Controls”
   b) Provide Temp Heat in existing rooms if new unit ventilator is not working. Temporary heater is to be safe for the operation of the school and the students till the permanent system is up and running.
   c) Include protecting all air intakes by mechanical equipment with filters to help mitigate dust control.
   d) Storage of material on and offsite is the contractors responsibility, prior to installation.
   e) Provide all temporary lighting and power during the one week shutdown for all HVAC work.

5. Construction:

   a) Mechanical Contractor is to coordinate rough opening in walls that require structural support including lintels with the General Contractor 4 weeks in

advance of needing the opening. The opening should be brought to the General Contractors attention during coordination and location and size of the opening required to also be provided.

b) Mechanical Contractor to coordinate with the General Contractor trenching and excavation, backfilling as well as new concrete equipment pads.

c) All low voltage for HVAC equipment by this trade. EC is responsible for providing power to equipment.

d) Provide and install all components into air and hydronic systems as required maintaining the integrity of the system per spec and programmed based on districts existing system:

    1) Provide TAB and participate in commissioning work of the EMCS as required for the work of this contract.
    2) Provide all ductwork as indicated on the drawings.
    3) Lifts and scaffold for means and methods of installation of work under this trade the responsibility of the trade.
    4) All exposed vertical piping for unit ventilators are to have painted metal pipe enclosures, color to be determined by Architect with district approval. Mechanical Contractor is responsible for this work.
    5) All interior horizontal piping is to be hidden above the ceiling. If there is a condition where piping maybe exposed but shows to be above the ceiling the mechanical contactor must notify the design team via a written RFI so they can review and respond accordingly.

e) Contractor to provide new filters for new units and contractor to provide an additional MERV 13 filter per unit.

f) Provide new RTUs and associated piping hangers and ductwork.

g) Provide all Mechanical equipment as scheduled on drawings.

h) Provide new unit heaters, and piping.

f) Provide contractor filters, final replacement filters and final duct cleaning for new work. Mechanical contractor is responsible for installing protection over existing register diffusers and grills as well as louvers to prevent construction debris from getting into existing systems.

i) Provide and install all insulation, painting and labeling of new and modified piping, ductwork and equipment as required.

j) Provide all testing, adjusting and balancing of all new and existing modified HVAC systems.

k) All fees required for inspections and permits. Building permit by owner

l) Provide support framing for HVAC equipment, i.e. mechanical equipment curbs, manufacture provided HVAC support frame or rails.

m) Furnish access doors for HVAC access (to be installed by GC). Must be lockable and common keyed.

n) Provide firestopping and sealing at all HVAC penetrations.

o) Provide the necessary curbs and layout for all roofing penetrations to the General Work Contractor.

p) Provide owner training / commissioning of equipment more than once if needed.

q) Provide replacement of all new unit filters after construction and punchlist is done and final cleaning is complete.

r) Provide Grilles as shown.

s) Provide and install all condensate drains from mechanical equipment.

6. General Requirements:

   a) a) including but not limited to, additional items specifically indicated as the Work of this Contract.

1.7 The Work of the HVAC Work Contract includes but is not limited to the Work that is specified in the Project Manual(s) and as shown on the drawings that form the contract plans. The Contractor is directed to examine all drawings since certain details and/or notes may appear anywhere therein that apply to his/her work.

1.8 CONTRACT 2 - ELECTRICAL WORK CONTRACT

A. Work of this Contract includes, but is not limited to, the following descriptions:

1. Electrical Distribution Service, Lighting, Communications, Fire Alarm, Emergency Lighting, and other systems traditionally recognized as Electrical work. The Electrical Contractor work includes but is not limited to the Work that is specified in the Project Manual(s) and as shown on the drawings that form the contract plans. The Contractor is directed to examine all drawings since certain details and/or notes may appear anywhere therein that apply to his/her work.

2. Coordination:

   a) Coordination with the work of all of the other contractors.
   b) Each trade will participate in producing coordination drawings.
   c) The mechanical, and electrical contractors will overlap their new work and coordinate locations, heights, routes, Etc. to eliminate hits and or obstructions from existing or new work. Each trade will meet once a week to coordinate their drawings. Ductwork and mechanical piping first, and electrical second. A full set of coordination drawings must be completed within **five weeks** after award of contract.

3. Demolition:

   a) Removal of items as shown and/or required.
   b) Removal and disconnections of electrical devices in walls,
   c) Coordinate with Jacobs, the General Contractor and Mechanical Contractor for necessary shutdowns and disconnects.
   d) See logistics plans for temp work to be performed by this trade.

4. Temporary Facilities: in addition to

   a) Provide Temporary Facilities indicated as Work of this Contract is Division 1 Section 01 5000, “Temporary Facilities and Controls”
   b) Provide temporary lighting (as required) construction staging/yard/work areas.
   c) Provide temp and permanent power outlets, panels and connections for other trades tools and equipment. No limit to how many temp services or voltage. Include abatement sub-contractors connections and disconnects

d) Provide and disconnect power to the abatement subcontractors temp panel.
e) Provide at minimum a 20KW, 120/208V, single phase mobile generator for use to power the building's Fire Alarm, Security System and IT systems while power is shut down during the new service upgrades. This should only pertain to the Electrical vault repair work at Temple Hill Academy and Meadow Hill GEM School. Please refer to Labella's construction documents for information on location and loads for temp generator. Block out a week during summertime for this shut down. Temporary lighting and power during the one week shutdown to be provided for all electrical work. This shutdown needs to be coordinated with the district at least one week in advance with the plan for sustaining districts operations presented.

5. Construction:

a) The General Construction Work Contract shall provide all openings in walls, floors, and roofs for all other Prime Contractors, that require lintels, and structural framing only. All other openings required for the work of this contract, will be the responsibility of this trade.
b) The General Construction Work Contract shall perform all necessary slab openings, trenching, excavation, backfilling, compaction, poured in place concrete infill inside and field required concrete for all other primes.
c) Provide ALL power wiring to ALL HVAC equipment. (Install motor controllers/disconnects supplied by HVAC Contract) including temp heat units provided by the mechanical contractor.
d) Provide all interior and exterior lighting including control per contract documents.
e) Provide all fire alarms per contract documents.
f) Provide all cutting and patching required installing all electrical fixtures, devices, wire and conduit.
g) Provide all fees required for inspections and permits other than owner supplied special inspections.
h) Provide support framing for Electrical equipment and conduits.
i) Provide a new outlet in the ceiling of each new unit for condensate pump.
j) Furnish access doors for electrical access (to be installed by GC). Must be lockable and common keyed.
k) Provide firestopping and sealing of all electrical penetrations.
l) Provide owner training and repeat if necessary.
m) All underground electrical utility work is the responsibility of this contractor.
n) This trade is responsible for all communications and coordination with utility companies.

1.9 CONTRACT 3 - GENERAL CONSTRUCTION

A. The general construction contractors work is all work includes but is not limited to the following items: (refer to the contract documents for full scope of work)

1. GC is responsible for providing the proper container for the discard of all mechanical demolished equipment. The mechanical contractor is responsible for disconnecting and discarding of all mechanical equipment. The GC shall coordinate with the mechanical contractor to stack the equipment correctly for proper disposal.

2. The GC is responsible for work related the following but not limited to:

    a) Structural Steel
    b) Waterproofing
    c) New suspended ceiling systems
    d) Acoustical tile ceiling system
    e) Gypsum Board Walls and Ceilings
    f) Painting and patching
    g) Door demolition and replacement
    h) Partition wall demolition
    i) Lintels
    j) Masonry work
    k) Fencing and Gates
    l) Metal stud walls
    m) All Concrete
    n) Reinforced Steel
    o) All Dunnage associated with Mechanical Equipment
    p) Flooring demolition and installation
    q) All shoring and shoring engineering for existing structure or masonry work, etc.
    r) Roofing and pitch pockets
    s) All sitework related to mechanical corrals and mechanical enclosures
    t) Asphalt site repairs related to construction work
    u) Sidewalk and curb repairs
    v) Landscape restoration

3. Coordination:

    1) Each prime contractor is responsible for creating a schedule and coordinating with the General Contractor to incorporate their activities into the general contractor’s master project milestone schedule.

    2) The General Contractor is required to lead, compile, and provide the following (but not limited to) coordinated shop drawings between all prime contractors:

        a) Benchmarks & site survey
        b) Foundation, rebar
        c) Miscellaneous metal
        d) trenching
        e) RCPs

4. Coordination With other Contractors:

1) Each trade will participate in producing coordination drawings. The General Contractor shall lead the coordination by means of producing a Master Construction Schedule for each school where construction work is being performed. The MEP prime contractors are responsible for providing 2D overlay shop drawings for coordination purposes and submit for design professional approval.

2) GC shall Provide a Recovery Schedule if the project is behind schedule and requires acceleration to meet the contract date.

5. Demolition:

1) Removal of masonry walls, doors, and interior partitions as required for new work. General Contractor is responsible for shoring, demolition and protection of areas associated with new work.
2) GC is required to patch miscellaneous openings caused by or related to the construction work of all prime contractors. Removal and disposal of miscellaneous equipment including all existing wall mounted specialty items and/or equipment not shown if impacting work to be demolished.
3) Provide all dust protection including but not limited to air filters for adjacent louvers and air intakes within forty feet of the exterior work area. Include protection of fire alarm devices, smoke detectors, duct detectors, louver intakes and mechanical unit returns. GC contractor to provide air scrubbers for all Areas of work in this Project.
4) Coordinate with CM and get district approval on a location to store any salvaged material the documents indicate to be turned over to the district. Any items not selected by the district to be salvaged are the responsibility of the contractor to dispose of.
5) All enlarged openings and associated structural lintels for mechanical penetrations are by GC Contract. Contract drawings to identify locations and structural drawings to provide lintel schedule.
6) General contractor to remove window or wall mounted A/C units as shown and described in the contract drawings. No existing units shall be removed until the new unit ventilators are installed and fully operational. Cover openings temporarily after removal until opening is completed with new work. A/C units to be salvaged and turned over to the district others to be disposed by contractor.
7) All Abatement shown in the contract documents. Abatement to be priced as an deduct alternate.
8) GC is responsible for restoring all existing conditions to remain affected by demolition work.

6. Temporary Facilities: In Addition to

1) GC to Provide Portable toilets for all trades per OSHA requirements.
2) Provide snow removal for contractor staging and all work areas.
3) Provide Dewatering activities for each construction site.
4) Each Subcontractor for GC Prime Contract is responsible for Existing Utilities Mark outs.

5) The GC is responsible for providing temporary construction signage as required by OSHA and the district while work is being performed on site.
6) Provide Temporary Facilities if indicated and needed as per the spec. Work of this Contract in Division 1 Section 01 5000, "Temporary Facilities and Controls".
7) Provide all temporary lighting and power during the one-week shutdown for all General Contractor work.

7. New Construction:

1) The General Construction Work Contract shall perform all necessary cutting, trenching, excavation, backfilling, compaction, and new concrete infills inside the existing building and field required poured in place concrete for all other primes. Coordinate A drawings with M, E drawings for existing slab openings for other trades and performed under this contract.
2) Provide multiple shift work as needed to complete work as shown on milestone schedule. Multiple shifts during the week and single shift on Saturdays will be required to make up days on the schedule, unless contractor requests the additional time for other reasons that are acceptable by the CM and district.
3) GC to paint the entire ceiling in the gym for Temple Hill Academy and Meadow Hill GEM School. Also GC to coordinate with Executive Director of Operations and Maintenance on Gym wall paint color and paint where the Mechanical units are removed in the gym.
4) General contractor to include all roofing scope in this contract including associated accessories like down spouts, crickets, and MEP openings, setting and roofing in MEP curbs.
5) General contractor to supply and install all casework as shown on the contract drawings. Field measuring and shop drawings for architect approval will be the responsibility of this trade.
6) GC to include all winter concrete and masonry measures and expenses in this contract.
7) GC is responsible for Dewatering of Construction Site.

B. The Work of the General Construction Contract includes but is not limited to, the following descriptions.

a) This trade is responsible for always maintaining a secure Site, including but not limited to locking all gates at the end of each day. Locks must comply with requirements of the local fire department and a copy of the key must be given to the Executive Director of Operations and Maintenance.
b) Guardrails, handrails, temporary stairs and ramps. Provide and maintain all site signage. Example; Gates , Hard hat area, No Smoking, Construction personnel only, Exit signs, Project information sign, Etc...
c) General Construction Contractor shall obtain and pay for any permits, inspections, or certifications from governing authorities having jurisdiction over the work to be performed, or over the finished product to be installed

by this Contractor. Project Building Permit is by owner. Include in this contract hydrant use permits if needed for construction activity.

d) Provide all roofing work for existing building renovations. Roof blocking and plywood, including:

1) Provide roof penetrations and blocking for mechanical equipment curbs furnished by Mechanical Contractor. Roof openings and patching is by the GC. Each trade shall mark out each opening for the GC to cut.
2) Patching at all removed existing walls. Including paint and finishes
3) Patching at all removed existing millwork and casework items.
4) Patching at all removed existing unit ventilators. Misc. insulation and brick infill at voids by General Contractor. Patch to match the brick/EIFS or adjacent/surrounding material at the exterior walls and the block at interior walls and where louver openings needed to be modified, or A/C units removed all by the General Work Contractor. Also patch to match existing floor at areas where old UVs are removed.
5) Patching any new door openings cut through existing walls.
6) Patching at all new walls in existing construction where existing walls have been removed.

e) Provide (unless noted otherwise):

1) Provide housekeeping pads for all Prime Contracts, coordinate as necessary for size and locations.
2) All access doors to be common keyed unless otherwise noted.

f) Remove and Install New ceiling tile as indicated for all trades.
g) Provide and install in addition to the contract work, per school seven boxes of new ceiling tiles to match existing ceiling tile as part of base bid.
h) Provide engineered shoring plan at any major wall openings for Architect review and or as called out on the drawings.
i) All access doors installed by the General Contractor. Access doors must be lockable and common keyed.
j) All concrete, rebar and forms provided and installed by the general contractor within this scope.
k) General contractor is responsible to modify classrooms as shown and described per contract drawings.
l) Provide and install all Structural steel as per the “S” drawings and or for MEP trades where structural support for their openings are required.
m) All interior trench infill requiring concrete will be by this contractor.
n) GC contractor to excavate for all trades and all work outside the building footprint.
o) GC contractor to include all topsoil and seeding.
p) GC contractor to include all paving/curbs/sidewalks and associated work including line striping.
q) GC contractor to include demolition and replacement of all sidewalks as shown on the drawings.
r) contractor to include any affected landscaping/plantings/trees.

s) Areas modified for construction/staging to be placed back to its natural state once construction is complete. Regrading and seeding as required.

1.10 WORK SEQUENCE

A. The Work will be conducted to provide the least possible interference to the activities of the Owner's personnel.

B. A Construction Manager Superintendent must be always on site when work is being performed. If the Prime Contractor fails to maintain the progress as indicated by the schedule by no other fault but its own and requires overtime to complete the work; the contractor shall make arrangements with the Construction Manager 48 hours in advance and pay for a Construction Manager's superintendent at $150.00 per hour. Advise the Construction Manager 48 hours prior to commencing work on the property. Regardless of schedule and delay, if the Prime Contractor wants to work overtime and weekends, the contractor shall make arrangements with the Construction Manager 48 hours in advance and pay for a Construction Manager's superintendent at $150.00 per hour. The contractor shall also be responsible for any district overtime incurred for its union facilities staff to make the building available for work at these times.

C. Coordination of any utility and/or power interruption must be done with the Construction Manager. Shutdowns must occur during off-hours and on days when the building is not occupied by the owner. Shutdowns must be coordinated one week in advance with the District.

D. Construction access to the site shall be limited to those designated for contractor's personnel, equipment and deliveries by the Owner. Contractors' staging, parking and storage shall be coordinated by the Construction Manager with Owner approval.

1.11 OCCUPANCY REQUIREMENTS

A. The GC shall provide Outdoor air quality management as specified by the Department of Labor and OSHA during construction

1. Provide an exhaust air system for the project indoor areas that could produce fumes, VOC's off-gasses, gasses, dusts, mists, or other emissions.
2. Exhaust air system for the project areas that could produce emissions listed in Paragraph 1 shall be utilized.
3. Provide Water for dust control.

B. Quality assurance:

1. Before start of work, submit a design for the exhaust air system. Do not begin work until approval of the Owner is obtained.
2. The number of machines required.
3. Location of the machines in the workspace.

1.12 End Of Contractor Scopes

1.13 PROJECT MILESTONE SCHEDULE

A. Below is the milestone schedule for this contract.

1. All submittals are required to be submitted within 30 days of NTP.

2. All project start up submittals are to be submitted within 2 weeks of the issuance of the NTP, which includes SOV, insurance and bonds, however these are not limited to what is shown in the contract documents.

3. Long lead items are to be submitted within 2 weeks of NTP issuance.

4. Construction duration is from **January 2025 to August 2025** known as final completion of construction work and ready for facilities. All work construction work including punch list and final cleaning must be complete by **August 22nd, 2025**.

B. Prime contractors to refer requirements identified in the multi prime contract summary for development of the project schedule to submit a schedule. Project scheduled to be submitted within 10 days after a Notice to Proceed is issued.

1.14 ALLOWANCES

A. See Specification Section 01 2100 and bid form.

1.15 ALTERNATES

A. The Contractor shall state where requested on the Bid Form the amount to be added to or deducted from the base bid for the alternates described in Section 012300 - Alternates.

END OF SECTION 011200

SECTION 012100 - ALLOWANCES

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 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.
2. Certain unforeseen items may arise during the construction and/or the requirements for items that could not be accurately detailed in advance may become apparent during the construction, which will require work to be added to one or more Prime Contract's Scope(s). Actual work, if and where necessary, shall be defined at a later date when additional information is available for evaluation.

B. Types of allowances include the following:

1. Contingency allowances.

C. Related Requirements:

1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders and Allowance Use Authorizations.
2. Division 01 Section "Payment Procedures" for procedures governing the Schedule of Values for Allowances.

1.3 SELECTION AND PURCHASE

A. At the earliest practical date, advise Architect of the date when final selection and purchase of each product or system described by an Allowance Use must be completed to avoid delaying the Work.

B. At Architect's request, obtain proposals for each Allowance Use for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.4 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in Allowance Uses, in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for Allowance Use items with other portions of the Work.

1.6 COORDINATION

A. Coordinate Allowance Use items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Field Orders/Directives from the Architect and/or Construction Manager that indicate amounts to be charged to the allowance. Overhead, profit, and Bond Premium are not an allowable cost for work completed under the allowance.

B. Prime Contractor's related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.

C. Field Orders authorizing use of funds from the contingency allowance shall include all Prime Contract related costs other than overhead, profit, and corresponding bond premium adjustment. One or more of the following methods, which will be specified in the written directive, shall determine the value of the Work directed under this allowance.

1. By applying the applicable price or prices set forth in the Contract Documents or by applying a Unit Price agreed to by both parties.

2. By estimating the fair and reasonable cost of:
   a. Labor including all wages, required wage supplements and insurance required by law (workers' compensation, social security, disability, unemployment, etc.) paid to or on behalf of foremen, workers, and other employees below the rank of Prime Contract designated representative directly employed at the site.
   b. Materials.
   c. Equipment, excluding hand tools.
3. Time and Materials
4. The Owner reserves the right to utilize these methods provided it notifies the Prime Contract of its intent to do so prior to the time the Prime Contract is properly authorized to commence performance of such work.

D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

E. Unused Materials:

1. Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
2. If requested by Architect and/or Construction Manager, prepare unused material for storage by Owner when it is not economically practical to return the material for credit. If directed by Architect, deliver unused material to Owner's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. Include in the base bid allowances in the amount/area listed below for all scope pertaining to 2019 Capital Project:

1. Gidney School
   a. $100,000.00 Allowance for unforeseen conditions pertaining to General Construction Work.
   b. $40,000.00 Allowance for unforeseen conditions pertaining to Electrical Work.
   c. $100,000.00 Allowance for unforeseen conditions pertaining to Mechanical Work.
2. Temple Hill School
   a. $300,000.00 Allowance for unforeseen conditions pertaining to General Construction Work.
   b. $80,000.00 Allowance for unforeseen conditions pertaining to Electrical Work.
   c. $250,000.00 Allowance for unforeseen conditions pertaining to Mechanical Work.
3. Meadow Hill School
   a. $300,000.00 Allowance for unforeseen conditions pertaining to General Construction Work.
   b. $80,000.00 Allowance for unforeseen conditions pertaining to Electrical Work.
   c. $250,000.00 Allowance for unforeseen conditions pertaining to Mechanical Work.

END OF SECTION 012100

SECTION 012200 - UNIT PRICES

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 SUMMARY

A. This Section includes administrative and procedural requirements for unit prices.

1.3 DEFINITIONS

A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

A. Unit price shall be used when and if required by Owner through Architect for all additions and deletions to the Contract quantities and shall be inclusive of furnishing and installing all necessary material, plus costs for delivery, insurance, labor, overhead, profit, equipment, hoisting, scaffolding, trucking, handling, submissions, layout, permits, coordination, hangers, inserts, couplings, testing, delivery, supervision, etc. as per change orders, and shall remain installed in quantities and locations as approved by the Architect/Construction Manager.

B. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

C. List of Unit Prices: A list of unit prices is included in the Bid Form. Specification Sections contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

1. Refer to Bid Form for list of Unit Prices.

END OF SECTION 012200

SECTION 012300 - ALTERNATES

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 SUMMARY

A. This Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section identifying each Alternate by number and describes basic changes to be incorporated into the Work only when that Alternate is made part of the Work by specific provision in the Owner/Contractor Agreement. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES:

A. Contract No. MC-01 – Mechanical Work: Add Alternate 01- Corridor Air Conditioning System at Gidney School.

B. Contract No. MC-01 – Mechanical Work: Add Alternate 02- Corridor Air Conditioning System at Meadow Hill School.

C. Contract No. MC-01 – Mechanical Work: Add Alternate 03- Corridor Air Conditioning System at Temple Hill School.

D. Contract No. MC-01 – Mechanical Work: Deduct Alternate 01- Control work at Gidney School.

E. Contract No. MC-01 – Mechanical Work: Deduct Alternate 02- Control work at Meadow Hill School.

F. Contract No. MC-01 – Mechanical Work: Deduct Alternate 03- Control work at Temple Hill School.

G. Contract No. EC-02 – Electrical Work: Add Alternate 01- Add Power for Corridor Air Conditioning System at Gidney School.

H. Contract No. EC-02 – Electrical Work: Add Alternate 02- Add Power for Corridor Air Conditioning System at Meadow Hill School.

I. Contract No. EC-02 – Electrical Work: Add Alternate 03- Add Power for Corridor Air Conditioning System at Temple Hill School.

J. Contract No. GC-03 – General Contractor Work: Alternate 01- Precast Concrete Mechanical Equipment Pads for Meadow Hill School.

K. Contract No. GC-03 – General Contractor Work: Alternate 02- Precast Concrete Mechanical Equipment Pads for Temple Hill School.

L. Contract No. GC-03 – General Contractor Work: Add Alternate 01- Painting Gym Deck, Joists, Existing and New Ductwork Meadow Hill School.

M. Contract No. GC-03 – General Contractor Work: Add Alternate 02- Painting Gym Deck, Joists, Existing and New Ductwork Temple Hill School.

N. Contract No. GC-03 – General Contractor Work: Deduct Alternate 01- Asbestos Abatement Work at Meadow Hill School.

O. Contract No. GC-03 – General Contractor Work: Deduct Alternate 02- Asbestos Abatement Work at Temple Hill School.

END OF SECTION 012300

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

A. This Section includes:
   1. Procedures for handling requests for substitutions made after award of the Contract.

1.3 DEFINITIONS:

A. Definitions used below are not intended to change or modify the meaning of other terms used in the Contract Documents.

B. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions". The following are not considered substitutions:
   1. Substitutions requested by Bidders during the bidding period, and accepted prior to award of Contract, are considered as included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
   2. Revisions to Contract Documents requested by the Owner or Architect.
   3. Specified options of products and construction methods included in Contract Documents.
   4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.4 SUBMITTALS:

A. Substitution Request Submittal:
   1. Requests for substitution will be considered if received within 45 days after Notice to Proceed. Requests received more than 45 days after Notice to Proceed of the Work may be considered or rejected at the discretion of the Architect.
   2. Submit 3 copies of each request for substitution for consideration. Submit requests on the “Request for Equivalent Review Form” located in Division 00, Section 00 63 19.
   3. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawings numbers.
   4. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
      a. Statement indication why specified material or product cannot be provided.

b. Product data, including Drawings and descriptions of products, fabrication and installation procedures.
c. Samples, where applicable or requested.
d. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as performance, size, weight, durability, visual effect, specific features and requirements indicated.
e. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors, that will become necessary to accommodate the proposed substitution.
f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
j. Cost information, including a proposal of the net change, if any in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
l. Include the Contractor's waiver of rights to additional payment or extension of time, that may subsequently become necessary because of the failure of the substitution to perform adequately.

B. Architect's Action:
1. Within one week of receipt of the request for substitution, the Architect will request additional information or documentation necessary for evaluation of the request.
2. Within 2 weeks of receipt of the request, or one week of receipt of the additional information or documentation, whichever is later, the Architect will notify the Contractor of acceptance or rejection of the proposed substitution.
3. Comply with requirements in Division 01 Section 01 32 19 "Submittal Procedures." Show compliance with requirements.
4. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name.
5. Acceptance will be in the form of a Change Order.

1.5 REIMBURSEMENT OF ARCHITECT'S COSTS:

A. In the event substitutions are proposed to the Architect after the Contract has been

awarded, the Architect will record time used by the Architect and the Architect's consultants in evaluating each such proposed substitution.

B. Whether or not the Architect approves a proposed substitution, the Architect will invoice the Owner for time spent in evaluating the proposed substitution. The Owner will, in turn, pass this cost on to the Contractor and require a "deduct" Change Order due to the Owner.

PART 2 – PRODUCTS

2.1 SUBSTITUTIONS:

A. Timing: Architect will consider requests for substitution if received within 45 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

B. The Contractor's substitution request will be received and considered by the Architect when one or more of the following conditions are satisfied, as determined by the Architect, otherwise requests will be returned without action except to record noncompliance with these requirements.
    1. Extensive revisions to Contract Documents are not required.
    2. Proposed changes are in keeping with the general intent of Contract Documents.
    3. The request is timely, fully documented and properly submitted.
    4. The request is directly related to an "or equal" clause or similar language in the Contract Documents.
    5. The specified product or method of construction cannot be provided within the Contract Time.
        a. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
    6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
    7. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear.
        a. Additional responsibilities for the Owner may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate contractors, and similar considerations.
    8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
    9. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
    10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.

C. The Substitution request shall comply with the following requirements are met:
    1. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    2. Evidence that proposed product provides specified warranty.
    3. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
    4. Samples, if requested.
D. The Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00

LaBella
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Newburgh Enlarged CSD
District Wide A/C – Electrical Upgrades

LaBella Associates, D.P.C.
Project No. 2233600
November 2024

REQUEST FOR INFORMATION

Requesting Contractor:	
Date of Request:	
Contractor RFI No.	**A/E RFI No.** (if different):
Priority ☐ **Critical** ☐ **Urgent** ☐ **Routine**	
Reference Dwg:	**Spec. Section:**
It is the writer's opinion that this RFI could impact: ☐ **Cost** ☐ **Schedule** ☐ **Security**	

Information Requested:	
Requested By:	**Please Respond By:**

Contractor's Suggested Solution: (If Any)

Answer:	
Answered By:	**Company:** **Date:**

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing contract modifications.

1. Prime Contracts: Provisions of the Section apply to the work of each Prime Contractor.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section “Allowances” for procedural requirements governing the handling and processing of allowances.
2. Division 1 Section “Submittal Procedures” for requirements for the Contractor’s Construction Schedule.
3. Division 1 Section “Applications for Payment” for administrative procedures governing Applications for Payment.
4. Division 1 Section “Substitution Procedures” for administrative procedures for handling requests for substitutions made after award of the Contract.

1.3 LABOR RATE BREAKDOWN

A. Prime contractors and their sub-contractors shall submit and update a completed hourly labor rate breakdown form for all trades or classifications of workers in their employ. A sample of the hourly labor rate breakdown for is included at the end of this section.

1.4 MINOR CHANGES IN THE WORK

A. The Architect, through the Construction Manager, will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or Contract Time, on AIA Form G710, Architect’s Supplemental Instructions.

B. The Construction Manager will issue an Allowance Disbursement form authorizing minor changes in the Work that will be compensated by subtracting from the allowance amount built into the base bid. (see specification section 01 2100)

1.5 REQUESTS FOR PROPOSALS

A. Owner-Initiated Proposal Requests: The Architect will issue a detailed description of proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal requests issued by the Construction Manager via Procore (CMS) are for information only. Do not consider them as an instruction to either stop work in progress or to execute the proposed change.

2. Within 5 days of receipt of a proposal request, Contractor shall submit a proposal of cost necessary to execute the change to the Construction Manager for the Owner's review vie Procore (CMS).
   a. Include a list of quantities of products required and unit costs, with the total amount of purchases and credits to be made. Where requested, furnish survey data to substantiate quantities.
   b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
   c. Include cost of labor and supervision directly attributable to the change.
   d. Include an updated Contractor's Construction Schedule in accordance with Division 00 that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract time.
   e. Include bare cost for allowance disbursement No overhead and profit markups allowed on allowance.
   f. Cost proposal to be in accordance with contract documents regarding allowable cost and markups for change order work.

B. Contractor-Initiated Proposals: When latent or unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Construction Manager.

1. Contractor must notify the Construction Manager in writing within 24 hours of the identified latent or changed conditions. Supporting documentation must be received within five days of notification.
2. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
3. Include a list of quantities of products required or eliminated, and unit costs, with the total amount of purchases and credits to be made. Where requested, furnish survey data to substantiate quantities.
4. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

5. Include costs of labor and supervision directly attributable to the change.
6. Include an updated Contractor's Construction Schedule in accordance with Division 00 that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
7. Comply with requirements in Division 01 Section "Substitutions Procedures" if the proposed change requires substitution of one product or system for a product or system specified.
8. Cost proposal to be in accordance with the contract documents regarding allowable cost and markups for change orders.

C. Proposal Request Form: .

1.6 ALLOWANCES

A. See specification section 01 2100

1.7 CHANGE ORDER PROCEDURES

A. Construction Manager shall issue Change Orders for signature by Contractor, Owner, and Architect, using appropriate forms and in accordance with General Conditions of the Construction Contract.

B. In addition to the requirements of Article 7 in the General Conditions, the following shall also apply.

C. If CM and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, the contractor must notify CM in writing the nature of the dispute and must, if so directed, proceed to complete the change on a time and material basis. Time and material tickets must be submitted daily for a signature by an authorized CM representative within 24 hours of performing the work. No overhead or profit will be paid on additional wages paid for overtime work or standby work. Signed T & M tickets must be submitted for invoicing within 30 days after work is completed. All invoices are to include an itemized breakdown for material and labor. Submit T & M invoices for extra work to CM's Project Superintendent and Project Engineer simultaneously.

D. Changes to the work cannot be billed until a contract change order has been issued.

E. Formula For Changes: Percentage Markup and Procedures Applicable to Work Added to the Original Agreement

F. Lump Sum: Predetermined Lump Sum additions and/or deducts to the Agreement are to be based upon the estimated "Net Actual Cost", plus the following maximum percentages for Overhead and Profit.

G. Time & Material: Additional Work to the Contract, authorized by CM in advance to be performed on a Time & Material Basis, is to be based upon the "Net Actual Cost", plus the following percentages for Overhead & Profit:

H. Maximum % for Overhead & Profit:

Prime Contractor Markup on Own Work (L&M)	Prime Contractor Markup on Sublet Work (L&M)	Subcontractor Markup
15%	**5%**	**10%**

I. Prime Contractor's 5% mark on Sublet Work shall be on the total of labor and material only and shall exclude the Subcontractor's mark up.

J. For each change, for Contractor, Subcontractor or Sub-subcontractor involved, the total aggregate sum mark up for all contractors shall not exceed 20% of the value of the work.

K. General:
1. Submission of lump sum estimates and costs shall be itemized in a form satisfactory to CM to permit ready analysis and evaluation. On Time & Material Work, daily reports in duplicate showing all field and shop labor expended and/or material delivered, shall be submitted to CM's Job Staff. Invoices shall be submitted monthly.
2. No overhead and profit will be permitted on the premium time portion of overtime work.
3. Percentages shall apply to net difference in quantities for adds and deducts in any one change.
4. "Net Actual Cost" defined'
5. Labor:
   a. Wages of labor, including foreman and general foreman, engaged in this work and directly on contractor's payroll.
   b. Engineering and drafting performed with CM's prior approval.
   c. Fringe Benefits established by governing trade organizations.
   d. Federal Old Age Benefits, Federal and State Unemployment Taxes.
   e. Net actual premium paid for Public Liability, Workman's Compensation, Property Damage, and any other forms of insurance required by the Owner.
6. Material:
   a. Net cost of construction materials and supplies delivered to site, including applicable Sales and/or Use Taxes, transportation costs, trade and cash discounts. (Note: Sales Tax is not applicable to transportation costs).
   b. Costs of a special nature, approved in advance by CM, such as for riggers, labor transportation, equipment rentals, royalties, permits and other expenses of this nature.
7. Percentages shall include the following overhead costs:
   a. Supervision and Executive Expenses (both field and office supervision).
   b. Small tools; incidental scaffolding, blocking, shores; appliances; contractor's trucks and driver, etc; and the expense of maintaining same.

c. Administrative expenses – clerical, accounting, etc.; both at the Project and the contractor's office.
d. Project Managers, Engineering costs, Shop Drawings, Proposal Preparation Review, Expediting Costs, etc.
e. Taxes required to be paid by the contractor, but not included under the aforementioned "Net Actual Cost".
f. Any other miscellaneous general conditions necessary to complete the Change Order.

8. Percentages shall include all profit.
9. Cost of Bonds, if applicable, are not included in the above percentages (i.e. no overhead and profit is allowed on bond cost). Bonds costs shall be identified as a separate cost at the end of project. Proof of bond rates from the bonding company is required prior to payment for additional bond costs.

L. Access to Accounting Records: The contractor shall check all materials, equipment and labor entering into the Work and shall keep such full and detailed accounts as may be necessary for proper financial management under this Agreement and the system shall be satisfactory to the Owner. The Owner or its representative shall be afforded access to all the contractor's records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda and similar data relating to the contract, and the contractor shall preserve all such records for a period of three years, or for such longer period as may be required by law, after the final payment.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 012600

SECTION 01 26 39 – FIELD ORDERS

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 SUMMARY

A. Field Orders/Change Issues are an interpretation of the Contract Documents or an order to do minor changes in the Work. Architect will issue through the Construction Manager supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time. Since time is of the essence, Contractor shall promptly complete the Work directed in the Field Order/Change Issue.

1.3 CHANGE ORDER PROCEDURES

A. No changes in work will be allowed without prior approval from the Owner and Architect. No additional costs will be accepted or authorized without prior written approval from the Owner and Architect. Failure to acquire approval will not entitle the Prime Contractor to reimbursement or payment for unauthorized changes. Likewise changes in work, without written approval, are subject to rejection and removal.

B. Upon the Owner's approval of a Contractor’s Cost Proposal, as initiated by the Proposal Request, the Construction Manager will issue a Change Order for signatures of the Owner, Construction Manager, Architect and the Contractor on AIA Form G701/CM.

1.4 MINOR CHANGES IN THE WORK

A. Architect will issue through the Construction Manager, supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions." If a Contractor determines that an “Architect’s Supplemental Instructions” will impact the Contract Sum or the Contract Time, that Contractor shall notify the Construction Manager immediately with a written explanation to substantiate the claim and a complete and detailed cost breakdown as required under paragraph 1.5 Proposal Requests.

1.5 PROPOSAL REQUESTS

A. Architect-Initiated Proposal Requests: The Architect through the Construction Manager will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by the Architect through the Construction Manager are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change, unless specifically indicated to do so by the Architect and the Construction Manager.
2. Within the time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a complete detailed material, equipment, and labor break down to substantiate the proposed costs.
    b. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    c. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to the Construction Manager.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a complete detailed material, equipment, and labor breakdown to substantiate the claim.
3. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
4. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 01 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified

C. Proposal Request Form: Use AIA Document G709 for Proposal Requests.

1.6 CHANGE ORDER PROCEDURES

A. Upon approval of a Proposal, the Construction Manager will issue a Change Order for signatures of the Contractor and Construction Manager.

1.7 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: A Construction Change Directive (CCD) is a written order to be used in the field to expedite work in advance of an agreement between the owner and contractor in regards to an approved change order. The Construction Change Directive instructs the Contractor to proceed with a change in the Work, pending subsequent final determination of a Change Order by the Architect, Construction Manager, and Program Manager. The Construction Change Directive may be issued by the Construction Manager or Architect, without invalidating the Contract, to order changes in the Work consisting of additions, deletions or other revisions. The Executive Director or Board Chair or Designee of the Rome CSD is authorized to approve work done under Construction Change Directives (CCD). Such approval by the Executive Director or Board Chair or Designee is subject to prior CCD approval by the CM, Architect, and PM.

1. The Construction Change Directive (CCD) contains a complete description of change in the Work. It also designates the method to be followed to determine the change in the Contract Sum. Once a CCD is approved, Owner is obligated to pay for work done under a CCD. However, billing and payment for the CCD work must be done following Owner approval of the Change Order that includes the work authorized by the CCD.

B. Documentation: Maintain detailed records on a time and material basis or Contractor's Cost Proposal of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost adjustments to the Contract.

2. Construction Change Directives are not change orders. No acceptance in whole, or in part, is implied by construction change directives.

Markups:

Prime Contractor Overhead = 15%

On Subcontractor work:
Prime Contractor Overhead = 5%
Sub Contractor = 10%

A maximum of 15% Overhead and Profit is allowed regardless of the amount of tiers of sub-contractors under the Prime Contract

Prime Contractor Bond = 2%

- The bond rate of 2% will be applied to both added work and credited work.

END OF SECTION 01 26 39

SECTION 01 26 43 - CHANGE ORDER REQUESTS

Refer to the General Conditions (00 72 16) and Field Orders (01 26 39) for any and all provisions governing additional work and/or changes to the work.

In order to facilitate checking of quotations for extras or credits, all proposals, shall be accompanied by a complete itemization of costs including labor, materials, dequipment and sub-contracts. All proposals without such itemization will be returned to the Contractor for resubmission, and Owner may issue a Construction Change Directive in lieu thereof.

All Prime Contractor and subcontractors labor rates are to be broken down on the attached labor rate breakdown sheet.

Submission of Change Orders will go through the Construction Manager.

Markups:

Prime Contractor Overhead = 15%

On Subcontractor work:
Prime Contractor Overhead = 5%
Sub Contractor = 10%

A maximum of 15% Overhead and Profit is allowed regardless of the amount of sub-contractors under the Prime Contract

Prime Contractor Bond = 2%

- The bond rate of 2% will be applied to both added work and credited work.

END OF SECTION 01 26 43

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Sections include the following:

1. Division 01 Section "Allowances" for procedural requirements governing handling and processing of allowances.
2. Division 01 Section “Contract Modification Procedures” for administrative procedures for handling changes to the Contract.
3. Division 01 Section “Summary of Work” for administrative requirements governing preparation and submittal of Contractor’s Construction Schedule and Submittals Schedule.
4. Contract Modification Procedures as defined in the General Conditions of the Contract.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

a. Application for Payment forms with Individual Continuation Sheets for each SED Project Number. An individual continuation sheet will be required for each of the following project numbers and corresponding costs:

1. NECSD MH School SED No. 44-16-00-01-0-035-014:
2. NECSD TH School SED No. 44-16-00-01-0-036-015

b. Submittals Schedule.

c. Contractor's Construction Schedule.

2. Submit the Schedule of Values to Construction Manager for approval at earliest possible date but no later than as further detailed in the General Conditions of the Construction Contract.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:

a. Project name and location.
b. Name of Architect.
c. NYSED Project Number(s).
d. Contractor's name and address.
e. Date of submittal.

2. Submit draft of AIA Documents G732 and G703 Continuation Sheets.

a. Use Table of Contents of this specification as basis for format for listing Labor and Material costs of work for all Divisions assigned to each contract.
b. Identify each line item with number and title as listed in Table of Contents.
c. Itemize separate line item cost for each of the following general cost items.
    1. Performance, Payment Bonds and Insurance
    2. Mobilization & Demobilization
    3. Field Supervision and Layout
    4. Temporary Facilities
    5. Project Meetings
    6. Project Safety
    7. Cleaning-Up (daily)
    8. Submittals and Shop Drawings
    9. Testing and Commissioning
    10. Project Close-Out Documentation
        i. As-Built Drawings
        ii. O&M's
        iii. Training
        iv. Misc. Forms
    11. Each Allowance associated with the Contract
    12. Each Alternate accepted
    13. Each Change Order as it is issued
d. Subtotal amounts by building, by renovations and as indicated by the sample at the end of this section.

3. Round amounts to nearest whole dollar: total shall equal the Contract

Sum.

4. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

   a. Differentiate between items stored on-site and items stored off-site. If specified, include evidence of insurance or bonded warehousing.

5. Allowances: Provide a separate line item/subtotal in the Schedule of Values for the allowance(s). Allowance authorizations will be allocated to the building that it applies to.

6. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

   a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and Construction Manager and paid for by Owner.

B. Payment Application Times: Draft copies shall be submitted by the 25th of each month. Draft copies are to be uploaded into CMS by the Contractor for review and approval by the Architect and CM prior to final submission. Payment Application shall reflect an accurate projection of work that will be completed through the end of that month, as agreed by the CM and the Architect/Engineer. Submit Approved Applications for Payment to the CM no later than seven (7) days after comments have been returned.

C. Payment Application Forms: Use AIA Document G732 –CMA and AIA Document G703 Continuation Sheets as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Construction Manager will return incomplete applications without action.

   1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.

   2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Transmittal: Submit three (3) signed and notarized approved original copies of each Application for Payment, to Construction Manager by a method ensuring receipt within 24 hours. All copies shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.

2. When an application shows completion of an item, submit final or full waivers.

3. Owner reserves the right to designate which entities involved in the Work must submit waivers.

4. Submit final Application for Payment with or proceeded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

6. With permission of the Construction Manager, stored materials can be billed for in the monthly payment application at invoice cost. No Overhead & Profit will be allowed on stored materials. Contractors will be allowed to bill for the Overhead & Profit, once the stored material is incorporated into the project. Invoices for material stored must be provided with the Monthly Application for Payment when billing for stored materials. This is a requirement for materials stored on or offsite. Materials stored off site must have a certificate of insurance for said material stored offsite at a particular location. The Construction Manager may request photos be provided of materials being stored off site to verify materials are marked for this project.

7. Billing for change work will only be authorized once the work is complete and an Allowance Authorization documents has been issued or a Change Order has been fully executed by all parties.

G. Payment Applications for progress payments to include, but are not limited to, the following requirements:

1. Affidavit and Waiver of Lien on the form in this section.

2. Invoices for stored material (if applicable).

H. Initial Application for Payment: Administrative actions and submittals that must approved prior to submission of first Application for Payment include the following:

1. List of subcontractors and suppliers.

2. Schedule of Values.

3. Contractor's Construction Schedule (preliminary if not final).

4. Products list.

5. Submittals Schedule (preliminary if not final).

6. List of Contractor's staff assignments.

7. List of Contractor's principal consultants.

8. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.

9. Certificates of insurance and insurance policies. (Submitted prior to contract issuing.)

10. Performance and payment bonds. (Submitted prior to contract issuing.)

11. Labor Rate Work Sheets.

I. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

J. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements. Executed “Final Releases” (Final Waiver of Claims and Liens and Release of Rights).

Attached at the end of this section.

2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid. Submit evidence of final, continuing insurance coverage comply with insurance requirements.

3. Updated final statement, accounting for final changes to the Contract Sum.

4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims." Attached at the end of this section.

5. AIA Document G706A, "Contractor's Affidavit of Release of Liens." Attached at the end of this section and each subcontractor.

6. AIA Document G707, "Consent of Surety to Final Payment." Attached at the end of this section.

7. Security for Guarantee Bond refer to contract documents.

8. Evidence that claims have been settled, approved written warranty, current certificate of insurance to coincide with the warranty period, the required number of copies of all written guarantees, warranties, operating and maintenance manuals, and test results, documentation that all verbal and written instructions and instruction sessions required by the Contract have been completed, the required number of copies of all Project Record Documents including "As-built" drawings, approved Shop Drawings and Product Data and all materials and equipment required as stock.

9. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.

10. Closeout binders and record documentation as outline in section 017700.

11. Fire Underwriter's Certificate: Provide New York State Board of Fire Underwriter's Certificate of Approval of electrical wiring or equivalent City electric Inspector’s approval.

12. Labor Affidavits (Prime and Subcontractor's Certifications).

13. Guarantee: Written guarantee on the Contractor’s letterhead of all work as called for in these contract documents.

14. Affidavit that No Asbestos Containing Materials were installed in this contract.

15. Verification of final completion of Punch List.

2.0 PART 2 – PRODUCTS (Not Used)

3.0 PART 3 – EXECUTION (Not Used)

END SECTION 01 29 00

SECTION 01 30 00 - CONSTRUCTION PROCEDURES AND CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specifications sections, apply to work of this section.

1.02 QUALITY OF MATERIALS AND WORKMANSHIP

1. Applicable industry standards are made part of the Contract Documents by reference and have the same force and effect as if the actual standards were physically bound into the Contract Documents.

1.03 REFERENCED STANDARDS

1. Referenced standards, those standards either referenced directly in the Contract Documents or referenced in governing regulations, have precedence over non-referenced standards which are recognized in the construction industry as being applicable to the work.

1.04 NON-REFERENCED STANDARDS

1. Non-referenced standards are those standards not directly referenced in the Contract Documents nor referenced in governing regulations, but are recognized in the construction industry, except as otherwise limited in the Contract Documents, as having direct application to the work and will be so enforced.

1.05 DATES OF STANDARDS

1. Where compliance with a standard is required, comply with that standard in effect on the date the Contract Documents are issued, unless otherwise indicated.

PART 2 - PRODUCTS

2.01 SOURCE OF INDUSTRY STANDARDS

1. The following is a partial list of organizations that have established standards of quality and workmanship.

   ANSI American- National Standards Institute
   ASTM American- Society of Testing Materials
   FMS - Factory Mutual System
   NEC - National Electric Code
   NFPA National- Fire Protection Association
   UL - Underwriters Laboratories Inc.

2.02 SYSTEMS AND RATED CONSTRUCTION IDENTIFICATION

1. Generally mechanical/electrical equipment systems shall be minimally labeled by each trade for identification and future maintenance use to minimally identify: Type of system (i.e. fire alarm, power, steam, H.W., etc.); and specific sub branch (i.e. circuits 12, 14, 16 – LP-2/7; dishwasher steam; etc.); direction of energy/signal flow with arrows, and operating directions (i.e. start up of dishwasher, HVAC operation, elevator emergency alarms, etc).

2. Terminal units/major equipment (electric panels, control panels, fan units, pumps, etc.) shall be minimally labeled with permanent, engraved, dual colored rigid plastic plates, mechanically attached.

3. Distribution systems shall be minimally labeled (so each sub system can be identified within 50') as follows:
    1. Insulated/un-insulated pipe/ducts/etc. (plumbing, HVAC, fire systems) shall have taped marker systems per applicable specification division (or at least painted (stenciled) labels, if not otherwise specified.
    2. Conduit/wiring distribution systems shall be minimally marked at each junction/distribution box with neat, ½" high hand lettered, permanent wide tip magic markers. Indication shall be on inside of box where box is in finished space or concealed/ buried, and on the outside where box semi-concealed such as above lay-in ceilings, or mechanical spaces such as crawl spaces.
    3. Distribution systems with receptacle type terminations at each end or flexible connection possibilities such as telephone or computer distribution systems shall have each receptacle and/or tie-in point labeled with specific distribution I.D. such as "Room No." plus additional I.D. breakdown as required (i.e. room number "101" plus #3 computer line = "101-3c").
    4. Existing systems disturbed by this contract shall be labeled/ relabeled similar to new work, by the Contractor responsible for that type of system.
4. Each new (or renovated existing) "Rated" wall construction shall be labeled. Labels to be "2 Hour Rated Wall" (or 1 hour, or ¾ hour), and shall be on each side. In mechanical spaces locate about 8' A.F.F. and mid point of length of wall unless a more visible location is possible. In "finished" rooms with suspended ceilings, locate just above ceiling level, in location most likely to be seen by maintenance personnel. Labels to be painted stencils 3" to 6" high applied after all finish painting is done, in a contrasting color. For existing walls in renovated areas, the applicable contractor shall also label these applicable walls.

2.03 MISCELLANEOUS DEFINITIONS

1. The term "product" as used herein in term contractions and unless specifically noted otherwise is to mean materials, systems and equipment.

2. The term "Project Manual" is used herein in term contractions and unless specifically noted otherwise is to mean the bidding requirements, Contract, Drawings and the Specifications.

3. The term "install" or "furnish all labor" are used herein as term contractions and unless specifically noted otherwise are to mean perform all operations connected

with installation of work including unloading materials to be installed, supplying all necessary equipment and rigs to do the work, test, place in operation and service.

4. The terms "furnish" or "furnish all material" are used herein as term contractions and unless specifically noted otherwise are to mean "supply and deliver to the job site all materials and/or equipment so specified".

5. The word "provide" is used herein as a term contraction and unless otherwise specifically noted is to mean "furnish, install, connect up complete, test, place in operation and service".

6. The terms "approved", "equal", "proper" and words of similar meaning are understood to mean "in the opinion of the RCSD Design Group".

7. The word "replace" is used herein as a term contraction and unless otherwise specifically noted is to mean "remove any existing and provide new".

8. The word “relocate” is used herein to mean “disassemble, disconnect, transport to new location, store during process, clean, test and install, ready for use similar to new work including providing any misc. adjustments, accessories, etc. required. It includes removing all materials, equipment, etc. made obsolete by this relocation and patching original remaining area. It does not include repairing any not functioning equipment.

9. The terms “finished area” or “finished room” is a normally finished (painted) and occupied/used space such as classrooms, offices and related storage space, corridors, stairways, etc. Generally it does not include mechanical spaces/rooms, plenum spaces, drawl spaces, etc. unless those spaces are specifically indicated to be painted.

10. The term “repair” (in reference to construction assemblies, not to repair of equipment) is essentially the same as “patching” a system.

11. The terms “general scope”, “diagrammatic”, and “schematic” are used to establish overall sizes, quantities, scope, etc. of a particular system, or sub-system as set out by the drawings. The intent is to establish the required work to which a “nominal” quantity of additions/deletions or work may be necessary to fit to existing as built conditions and/or field conditions.

12. The term “nominal” is used to define an additional or lesser amount of work that is expected to be part of the scope of work with no change in cost.

13. The term “applicable contractor” (or similar wording) is to mean the contractor which has responsibility under his contract for the items/ trades involved in that particular use of the term. (i.e. it is the “Plumbing Contractor” if the discussion involved work related to “gas” piping. It is the Electrical Contractor if the discussion involves electric device boxes).

PART 3 - EXECUTION

3.01 PRESENT BUILDING OPERATION

1. The particular attention of the Contractor is directed to the requirement that the school must continue to function during the normal school year. Occupants and related personnel must have safe access, at all times, to those portions of the present school building being used by the school. Close cooperation with the occupants of the school is essential. The use of roofs, corridors, stair towers or exits as work areas or as storage areas for material, equipment or tools is prohibited.

3.02 LAYING OUT WORK

1. The Contractor employed on this project shall lay out all work included in his Contract as shown on the drawings and/or called for in these specifications. Take all required measurements and order all materials promptly. The Contractor will be held responsible for all damage or expense caused by inaccuracy on his part in laying out work.

2. Installer of each major unit of work is required to inspect substrate to receive work and to report in writing to the Contractor, Construction Manager and Architect/ Engineer unsatisfactory conditions. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

3.03 COORDINATION AND COOPERATION

1. Contractor Contact; The Contractor and all of the Contractor's workers will be prohibited from any contact with the school's student or staff population. Contact with the Owner will primarily be made through the Construction Manager. In case of emergency, notification shall be made to the school principal and head custodian in addition to the Construction Manager.

2. Coordination and Cooperation; The Contractor shall be responsible for the work of this project among his employees and subcontractors and for the coordination and cooperation between his employees, all other Contractors that are engaged on this project, their employees, subcontractors and the Owner.

3. Supervision: A full time superintendent is required when contract amount exceeds $50,000. Supervision includes coordination of work with the Owner and other contractors as well as providing direction to the contractor's workers, sub-contractors and suppliers. The superintendent shall be present at all project progress meetings. A change in supervisory personnel after the commencement of work shall be permitted only upon approval of the Inspector.

3.04 EXISTING ALARM SYSTEMS

1. All systems are slated for demolition. Setup and maintenance of a temporary fire alarm system is required utilizing the existing fire alarm panel.

3.05 EMERGENCY PROCEDURES

1. Emergencies requiring the evacuation of the school building are indicated by the ringing of the fire alarm bells. The Contractor and all his workmen, subcontractors and vendors must leave the building promptly and in an orderly manner. Do not re-enter the building until permission is given by the Principal. The Contractor shall enforce the strict compliance of these required emergency procedures by all his workmen, subcontractors and vendors.

3.06 SMOKING

1. Smoking shall be prohibited in school buildings, school grounds, public areas and work sites of all Owner's and RCSD's property, as well as any area immediately outside building entrances in accordance with Article 13-E of the New York State Public Health Law, as amended and Article VII of the Monroe County Sanitary Code. The Contractor will be held responsible for all damage resulting from failure on his part to enforce this ruling among all his respective employees and vendors.

3.07 PROTECTION OF BUILDINGS AND GROUNDS

1. The Contractor shall take all necessary steps to protect the grounds, the building and its equipment. Where materials are brought into the building and wherever the work is done in the building, protect all finished surfaces. Any damage resulting from the work of the Contract shall be repaired at no cost to the Owner.

2. The Contractor shall provide secure barriers at all the work areas and staging areas. The Owner, RCSD, or Owner's Representatives shall not be responsible for theft or vandalism of materials, equipment, or work in progress until completion of project. The Contractor shall be responsible to provide security of site and all work. Barriers shall be located in such a manner that all egress and exits are maintained.

3. The Contractor shall provide temporary enclosures of the building at all locations where either new or existing openings are required. Enclosures shall be secure, weather tight and provide the least disturbance of the existing construction that is to remain. Upon removal of enclosures, restore all work to existing or new conditions. Submit data for approval by the Construction Manager and the Architect/ Engineer prior to commencement of work. Work that involves temporary removal of building openings for purposes of work area exhaust or to facilitate work in progress shall necessitate temporary security to prevent damage to building from theft or vandalism.
4. Parking on playing fields and in staff parking areas while school is in session is not permitted. During the last week of August, all paved parking areas shall be turned over to the Owner.

5. Prior to commencement of work and in the presence of the Construction Manager, complete the attached Building Systems Status form. This form shall be submitted prior to the first application for payment. At the completion of the project, a walk-through with the Inspector will be done, verifying building system status after construction. If the contractor fails to perform pre and post inspections, and building systems are found to be damaged or defective at completion of

construction, the Owner will assume that the Contractor is responsible for all cost required to restore system(s).

3.08 STAGING AREAS FOR DEMOLITION AND CONSTRUCTION

1. Staging areas for demolition and construction shall be approved by the Construction Manager and the Architect/Engineer prior to start of work. The use of roofs, corridors, stair towers or exits as work areas or as storage areas is prohibited.

2. Store all flammable and combustible materials in a locked fire rated enclosure. Paint shall be stored in a paint locker.

3.09 WORKING WITH AN OPEN FLAME

1. The Contractor shall comply with the Town of Carmel Fire Department – Fire Safety Division's requirements for open flame use such as welding, asphalt kettle burners, etc., and shall acquire a permit for such use from the Permits Clerk of the Fire Safety Office. A copy of this permit is to be provided to the Owner. The following is a brief listing of the minimum requirements during use of an open flame. Additionally, all policies established by the City Fire Department shall be complied with.
    1. Any combustible materials near the work area that may be accessible to spark, flame, heat or hot metal, that may cause ignition, are to be protected by non-combustible shields or covers.
    2. A minimum of two (2) 20 pound dry chemical or carbon dioxide fire extinguishers shall be provided by the contractor, immediately available at the work area.
    3. A fire watch shall be provided to watch for fires, make use of portable fire extinguishers and perform similar fire prevention and protection duties. The fire watch shall remain for at least 30 minutes after the use of any flame to insure no fire exists.
    4. Fuel gas tanks (oxygen, acetylene, liquid petroleum, hydrogen, natural gas, etc.) shall be securely held upright, away from all exits, windows and combustible materials, provide full air circulation to prevent exposure to high heat, and removed from premise at end of each day.
    5. The building is not to be occupied by students or staff during any open flame tasks.

3.10 Lockout/Tagout Procedure

1. The contractor must adhere and strictly follow either the Project Lockout and Tagout requirements, the owner's requirements or the contractors own requirements, whichever is the most stringent.
2. Electrical work (e.g. tie-ins, panel maintenance) shall be conducted only on de-energized (locked out and tagged out) systems.

3. All circuit disconnects must be locked in the open position or otherwise appropriately identified with affixed tags stating "DANGER - DO NOT ENERGIZE" or other equivalent wording prior to working on the system or equipment.
4. Employees are not permitted to work on any energized circuits unless conditions mandate and written approval is obtained from the Regional Safety Manager.
5. The pre-task planning for all work on energized systems must be submitted for review.
6. Work practices must conform to all applicable owner, state and federal requirements including the NEC and the most recent version of NFPA 70E.

Lockout Devices

1. Only individually keyed padlocks shall be used. Padlocks are to be painted per the craft color code for easier detection and craft identification.
2. A lockout device of the standard scissor type that will allow the placing of more than one padlock is required, when more than one individual is working on a circuit or mechanical process.
3. A piece of chain or cable may be necessary to complete a lockout on some valves or controls and shall be used wherever needed.

Danger Tags

1. 'Danger Tags' are not 'Danger Signs', and shall not be used where a sign is needed.
2. Two standardized Danger Tags shall be used on this project. They are described as follows:
    a. "DANGER - DO NOT USE": This tag must be attached to each padlock on a lockout.
    b. "UNSAFE - DO NOT USE": This tag does not require an attachment to a padlock, but may be used if needed. This tag shall be used to identify tools, equipment, vehicles, etc.

Procedure

1. If device, valve, switch, or piece of equipment is locked out, a "Danger Tag" shall be attached.
2. No device, valve, switch or piece of equipment shall be operated with a "Danger Tag" and/or lockout attached regardless of circumstances! ! !
3. Systems consisting of electrical components will be checked, locked and tagged first by electrical craft employee working on the circuit.
4. The electrical craft will be the first lock on, and the last lock off.
5. Where placing of lock is not feasible, the circuit conductor will be disconnected from the breaker and tagged out.
6. The panel cover must be of the type that will cover all breakers when closed and must be equipped with a hasp in order to secure a lock to prevent the panel door from being opened.

7. If panel cover is of a type that cannot be locked closed, a cover must be secured over the panel cover and be locked closed and tagged while any work is being performed on any of those circuits.
8. If the above cannot be accomplished, each circuit will be tagged out as prescribed and an electrician will stand by the panel board to prevent breakers from being tampered with. This physical presence will continue daily until the work is complete.
9. All "Danger Tags" must be dated and signed. Also on tag, must be the intended work and equipment for which tag has been placed.
10. If employees of more than one craft or crew are to work on a system, circuit, machinery, or component, the supervisor from that craft shall place his individual lock and tag; and verify that the system, circuit, machinery or component being tagged, is indeed the system that is to be worked on.
11. Only the person that placed the lock and tag shall remove it without special authorization from the Project Manager, Construction Manager or Craft Superintendent.
12. Padlocks, Lockout Devices and "Danger Tags" shall be made available as specified above.
13. Padlocks shall be color coded for craft identification and shall only be used by that craft for lockout purposes, i.e. valves, switches, electrical components, etc.
14. Padlocks shall be issued from the contractor responsible where a sign in/out log will be maintained. Locks and tags shall be issued to the foremen or supervisor responsible for the craft performing the work.
15. The contractor of each craft discipline will be responsible for assuring all padlocks are personally identified, that will be used for lock and tag purposes.
16. The Contractor Superintendent(s) will be responsible for ordering their own craft's padlock. A master key will also be provided.
17. Any employee(s) or person(s) found to have removed another's lock and/or tag will be subject to disciplinary action up to and including dismissal from the project.

Special Situations

1. When due to the nature of work, a supervisor who has employees assigned to work on systems that are between construction and client turnover that is to be locked and tagged out in order to perform work, the below shall be applied:
2. Prior to the electrical foreman de-energizing the system, the foreman will ascertain whether system or device has been turned over and accepted by the client; If system is signed off, the client shall assume responsibility for de-energizing system and becoming the tagging authority.
3. Contractor Electrical foreman/craft journeyman places lock and tag and tries to engage the equipment.
4. The electrical journeyman or lead man will meter the tagged equipment to verify that it is de-energized.

3.11 HOT WORK

1. Before engaging in hot work i.e. gas welding/cutting, soldering, grinding, utility shutdowns and crossovers submit Hot Work Permit Forms for approval and use.

Electric Arc Welding

1. A suitable, approved fire extinguisher shall be ready for instant use in any location where welding is done.
2. Screens, shields, or other safeguards should be provided for the protection of men or materials, below or otherwise exposed to sparks, slab, falling objects, or the direct rays of the arc.
3. A dedicated fire watch shall be present at all welding operations and remain for at least 1 hour after the hot work has halted.
4. The welder shall wear approved eye and head protection.
5. Trades assisting the welder shall also wear protective glasses, head protection and protective clothing.
6. Adequate exhaust ventilation shall be maintained at all welding and cutting work areas.
7. Electric welding equipment, including cables, shall meet the requirements of the National Electric Code.
8. All arc welding and cutting cables shall be of the completely insulated flexible type capable of handling the maximum current requirements of the work.
9. Cables in need of repair shall not be used.
10. The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable connecting the circuit connector or through a separate wire which is grounded at the source of the current.
11. All ground connections shall be inspected to insure that they are mechanically strong and electrically adequate for the required current.
12. Welding practices shall comply with all applicable regulations.

Gas Welding or Cutting

1. When gas cylinders are stored, moved, or transported, the valve protection cap shall be in place.
2. When cylinders are hoisted, they shall be secured in an approved cage or basket. The valve cap shall never be used for hoisting.
3. All cylinders shall be stored, transported, and used in an upright position. If the cylinder is not equipped with a valve wheel, a key shall be kept on the valve stem while in use.
4. At the end of each work day or if work is suspended for a substantial period of time, compressed gas cylinder valves must be closed, regulators removed and properly stored.
5. Cylinders containing oxygen or acetylene or other fuel gas shall not be taken into confined spaces.
6. Cylinders containing oxygen or acetylene or other fuel gas shall be stored in designated areas outside the structure as approved by the CM.
7. No one shall use a cylinder's contents for purposes other than those intended by the

supplier.

8. All hose used for carrying acetylene, oxygen or other fuel gas shall be inspected at the beginning of each working shift.
9. Defective hose shall be removed from service.
10. Oxygen cylinders and fittings shall be kept away from oil and grease.
11. Oxygen shall not be directed at oily surfaces, greasy clothes or hands.
12. Regulators, gauges, backflow check valves, and torches shall be kept in proper working order.
13. An approved fire extinguisher shall be readily available.
14. Flash arrestors are required on the oxygen and acetylene hoses, at the regulators.
15. Appropriate personal protective equipment, such as burning glasses, shields, and/or gloves shall be used.
16. Adequate exhaust ventilation shall be maintained at all welding and cutting work areas.
17. Work permits shall be obtained daily, prior to any burning or cutting operations on the site.

Work Permit Procedures

General Procedures

1. A copy of this section of the Project Safety Plan will be issued to all Contractors, and will serve as notice by the CM that a work permit as specified by the CM is necessary before starting any hazardous work activity.
2. The work permit shall be obtained from the CM before starting each day's work.
3. The procedures for initiating a hazardous work permit are listed on the permit application appropriate to the type of work.
4. Hazardous work Permits include, but are not limited to the following activities: Hot Work, Confined space entry, Guardrail removal, Line Breaks, after Hours work, Trenching and excavation, Crane use and Barricade installation.
5. Additional job-specific hazardous work permits may be required, due to special project conditions, to be incorporated into the project safety plan. These will also be considered as a contract commitment.

Hot Work

1. Hot work is defined as a process or procedure, which could result in a fire if not properly controlled. Common types of hot work are welding, burning, cutting, brazing, soldering.
2. Hot work will usually be permitted only during normal working hours.
3. Permits will be issued the day before work is to be accomplished, and the work area will be inspected to verify that adequate control has been established.
4. A copy of the permit will be available at the point of work.

5. An adequate number of fire extinguishers will be available within 50-feet of the point of work for which a permit is issued.
6. The Contractor will take the necessary precautions when welding or burning above walls to assure that protection is maintained on both sides of the wall and areas below are protected on multilevel buildings.

END OF SECTION 01 30 00

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Contractor shall participate in all coordination requirements and project meetings in order to facilitate coordination between trades/subcontractors. Certain areas of responsibility will be assigned to a specific trade contractor.

1. Coordination Drawings
2. Administrative and supervisory personnel.
3. Project Meetings.
4. Request for Information (RFI's)

B. Construction Manager shall schedule and administer Project Meetings. All meeting minute are to be set-up, recorded and distributed through Procore by the Construction Manager.

C. Related Sections include the following.

1. Division 01 "Summary of Work" for coordination activities not in this Section.

1.3 DEFINITIONS

A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.4 GENERAL PROJECT COORDINATION

A. Coordination: Coordinate construction operation included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different sections that depend on each other for proper installation, connection and operation.

B. Coordination: Contractor shall coordinate its construction operations with those of other contractors, sub-contractors and entities to ensure efficient and orderly installation of each part of the Work. Contractor shall coordinate its operations with operations, included in different Sections that depend on other trades for proper installation, connection, and operation.

1. Coordinate installation of different components with other trades to ensure maximum accessibility for required maintenance, service, and repair.

2. Make adequate provisions to accommodate items scheduled for later installation.
3. Schedule construction operations in sequence required to obtain the best results here installation of one part of work depends on installation of other components, before or after its own installation.
4. Where availability of space is limited, coordinate installation of difference components to ensure maximum performance and accessibility for required maintenance, service and repair of all components, including mechanical and electrical.
5. Schedule work and cooperate with others to avoid delays, interferences, and unnecessary work, conforming to the construction schedule.

C. Prepare minutes for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings. Minutes will be prepared and distributed through the Construction Management System “Procore”.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of Temporary Facilities and Controls.
4. Delivery and processing of Submittals.
5. Approval of Labor Rate Worksheets – for each trade classification on project per Contractor /subcontractor/sub-subcontractor/Consultants – obtain form under Section 00 9500 “Project Forms and Documents”
6. Progress Meetings.
7. Pre-installation Conferences.
8. Project Closeout Activities.
9. Startup and adjustment of systems.
10. Training
11. Project Closeout Activities.

E. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

F. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

G. Conservation: Coordinate construction activities to ensure that operation are carried out with consideration to conservation of energy, water and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the work. Refer to other sections for dispositions of salvaged material designated as Owner's property.

1.5 COORDINATION DRAWINGS

A. Coordination Drawings: Prepare Coordination Drawings for all areas, by building, floor, area and/or phase, of the project. Close attention should be implemented where limited space availability necessitates maximum utilization of space for efficient installation of different components; in the following manner:

2. MEP (Plumbing, HVAC & Electrical) Trades are responsible to prepare coordination drawings to a Scale of 1/4" = 1'-0" or larger; detailing major elements, components, and systems of mechanical and electrical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including but not limited to the following:

    1. Proposed locations of ductwork, piping, conduit, equipment, and materials.
    2. Clearances for installing and maintaining insulation.
    3. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
    4. Equipment connection and support details.
    5. Exterior wall and foundation penetrations.
    6. Fire rated wall, floor, ceiling, access doors and roof penetrations.
    7. Sizes and location of required concrete pads and bases.
    8. Valve stem movement.
    9. Sleeves.
    10. Indicate required installation sequences.

3. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations. Clearly define relationships between sleeves, piping, ductwork, conduit, ceiling grid, lighting, fire sprinkler, HVAC equipment and other mechanical, plumbing, and electrical equipment with other components of the building such as beams, columns, ceilings, and walls.

4. Prepare reflected ceiling plans to coordinate and integrate installations of air outlets and inlets, light fixtures, communication systems components, sprinkler, and other ceiling mounted items.

5. Resolve conflicts between trades, prepare composite coordination drawings and obtain signatures from all affected trades on original composite drawings. Submit coordination drawings to A/E and Construction Manager.

6. MEP Trades are to first submit their respective shop drawings for approval, to the Architect / Engineer, in order to make any necessary changes prior to going through the coordination process.

7. Coordination drawings to be signed off by affected Trades within 45 days of Notice to Proceed. A Coordination drawing timeline schedule shall be developed and tracked.

8. The coordination drawings shall be coordinated with the construction & phasing schedule.

9. The routing process will begin with the HVAC Trade who shall take the lead in the coordination of their work with all affected trades.

10. The HVAC Trade shall prepare background drawings to be used as the basis for coordination drawings in all areas or as determined by the Construction Manager (Scale: 1/4" = 1'-0" or larger). These drawings shall be completed by a qualified HVAC draftsperson. All Architectural features shall be accounted for in preparation of this drawing; i.e., permanent, casework, interior columns, partitions, finish ceiling and height, lighting and roof elevations, etc. The HVAC Trade will provide a black line drawing showing all of the approved ductwork. HVAC Trade is to locate all piping with orange lines. Forward drawings to the Plumbing Trade. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.

11. Structural Penetrations: Indicate penetrations and openings required for all disciplines.

12. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.

13. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

14. The Plumbing Trade is to locate the plumbing lines with blue lines, and resolve all conflicts and determine locations and elevations, and forward drawing to the Electrical Trade.

15. The Fire Protection Trade is to locate sprinkler piping and head locations with red lines and resolve all conflicts and determine locations and elevations and forward drawing to the Electrical Trade

16. The Electrical Trade to indicate all lighting fixtures, panels with associated clearances, duct banks, bus duct, conduit racks and all individual conduits 1 1/2" and larger in with green lines, and resolve all conflicts and determine locations and elevations and forward to the Theatrical Trade. Plenum Space: Indicate sub-framing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate

components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.

17. The Theatrical Trade is to locate the battons, rigging, stage lighting, sound equipment, audio video equipment and all individual theatrical items and utilities as required and forward drawing to the General Construction Contractor.

18. The General Construction Contractors will have the last coordination review. Provide overlaid coordination drawings for all General Construction work and resolve all conflicts. All Architectural features shall be detailed clearly, i.e. permanent casework, interior columns, partitions, finish ceiling and roof elevations, etc. Provide a ceiling lay out detailed coordination drawing showing ceilings, lights, diffusers…etc

19. Contractor to provide underground coordination drawings for all underground utilities; show exact location of piping stub ups, floor drains, etc. as required.

20. Contractor shall have the option to provide coordination drawings using a computer aided design (CAD) software at no additional cost to the Owner. Contractor is responsible for all costs associated with obtaining backgrounds from Architect/Engineer.

21. All coordination meetings will be held in the Construction Managers field office. As each coordination drawing is completed, Trades are to meet with the Construction Manager to review and resolve all conflicts on the coordination drawings. Contractor is required to distribute shop drawings, cut sheets & submittals to other Trades where appropriate. Approved coordination drawings will also be available for reviewing at the Construction Managers field office.

22. Contractor shall provide a hard copy of the coordination drawings for review by the Architect/Engineer.

23. Once complete and signed off, the HVAC, Plumbing, Electrical and Theatrical Trades will submit dimensioned wall and slab penetration drawings and housekeeping pad drawings to the appropriate parties.

24. Contractor must install the work in accordance with the coordinated drawings at no additional cost to the Owner. No additional compensation will be made for extra ductwork offsets, piping and/or conduit or retrofit work due to improper component location, or lack of Contractor(s) coordination.

25. Contractor shall take special care in verifying with the Electrical and Theatrical Trade that the equipment matches the characteristics of the power being supplied. The Electrical and Theatrical Trade are similarly bound.

26. The HVAC, Plumbing and Electrical Drawings are schematic in nature and are not intended to show every offset and detail. The HVAC, Plumbing and Electrical Trades will make adequate provisions in their bid to accommodate the actual conditions, provide all required ductwork, piping and conduit offsets per the coordination drawings, without additional cost to the Owner.

27. Review: Architect and Construction Manager will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.

1.6 LOCATION STREAMERS

A. The HVAC, Plumbing, Electrical and Theatrical Trades shall hang streamers from all above ceiling equipment that will require access. This is in addition to any specification requirements for tags, labels, etc. Shop drawings should also highlight these areas for Architect/Engineer's review. In addition, the Contractor shall notify the Construction Manager and Architect/Engineer of all areas where equipment maintenance access is difficult. Coordinate architecturally placed access doors with points of mechanical / electrical systems requiring that access.

1.7 PROJECT MEETINGS

A. General: Construction Manager will schedule and conduct meetings and conferences at Project site unless otherwise indicated.

   a. Attendees: As indicated for each meeting listed below.

   b. Agenda: Entity responsible for conducting the meeting will prepare the meeting agenda.

   c. Minutes: Entity responsible for conducing meeting will record and distribute significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, Construction Manager, Architect, and contractors within three working days of the meeting through Procore (CMS).

B. Project Kickoff Meeting: Construction Manager will schedule and conduct a project kickoff meeting before starting construction, at a time convenient to Owner and Architect.

   1. Conduct the conference to review responsibilities and personnel assignments.

   2. Attendees: Authorized representatives of Owner, Construction Manager, Architect, and their consultants; Contractor and its major subcontractors (more than 5% of the contract value); suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

   3. Agenda: Introduction and sign in of attendees

   4. Contractor to submit:
      a. List of major Subcontractors and Suppliers.
      b. Tentative procurement and construction schedule.

c. Staff names.
d. Preliminary Submittal Schedule.
e. Labor Rate Sheet: Provide for each trade classification of Prime Contract workforce on form per Section 00 9500 “Project Forms and Documents.”

5. Discuss items of significance that could affect progress, including the following:
   a. Milestone construction schedule.
   b. Phasing.
   c. Critical work sequencing and long-lead items.
   d. Designation of key personnel and their duties.
   e. Lines of communications.
   f. Construction Management Software – Procore.
   g. Procedures for processing field decisions and Change Orders.
   h. Procedures for RFIs.
   i. Procedures for testing and inspecting.
   j. Procedures for processing Applications for Payment.
   k. Distribution of the Contract Documents.
   l. Submittal procedures.
   m. Shop Drawing, product data and samples.
   n. Coordination Drawings.
   o. Preparation of record documents.
   p. Use of the premises and existing building.
   q. Work restrictions.
   r. Working hours.
   s. Owner's occupancy requirements.
   t. Responsibility for temporary facilities and controls.
   u. Procedures for moisture and mold control.
   v. Procedures for disruptions and shutdowns.
   w. Construction waste management and recycling.
   x. Clean-up Procedures.
   y. Parking availability.
   z. Office, work, and storage areas.
   aa. Equipment deliveries and priorities.
   bb. Project Safety Requirements & Training.
   cc. Project Orientation requirements - Security & Identification Badges.
   dd. Progress cleaning.
   ee. Location and time for progress meetings.

6. Minutes: Construction Manager will record and distribute meeting minutes through Procore.Pre-Installation Conferences: Construction Manager shall conduct a pre-installation conferences at Project site before each construction activity that requires coordination with other construction and as identified in individual specification sections.

1. Attendees: Prime Contractor, Subcontractor, Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Construction Manger shall advise Architect of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
   a. Safety
   b. Contract Documents.
   c. Options.
   d. Related RFIs.
   e. Related Change Orders.
   f. Purchases.
   g. Deliveries.
   h. Submittals.
   i. Review of mockups.
   j. Possible conflicts.
   k. Compatibility requirements.
   l. Time schedules.
   m. Weather limitations.
   n. Manufacturer's written instructions.
   o. Warranty requirements.
   p. Compatibility of materials.
   q. Acceptability of substrates.
   r. Temporary facilities and controls.
   s. Space and access limitations.
   t. Regulations of authorities having jurisdiction.
   u. Testing and inspecting requirements.
   v. Installation procedures.
   w. Coordination with other work.
   x. Required performance results.
   y. Protection of adjacent work.
   z. Protection of construction and personnel.
   aa. Conformance with Construction Manager’s Project construction schedule.
   bb. Warranty requirements and manufacturers inspection notification.

3. Construction Manger: Record significant conference discussions, agreements achieved, and disagreements, including required corrective measures and actions.

4. Reporting: Construction Manager to Distribute minutes of the meeting to each party present and to other parties requiring information through Procore within there (3) day of the meeting to all in attendance.

5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Construction Manager will conduct progress meetings at biweekly intervals. Schedule for regular weekly Forman Meetings will be set up at the Pre-Construction Meeting. Schedule for regular bi-weekly Project Manager and Architect Meetings will be set up at the Pre-Construction Meeting.

1. Attendees: In addition (representatives of Owner), Construction Manager, Architect, Contractor's Project Manager, Contractor's Project Superintendent, major sub-contractors, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
        1) Review schedule for next period.

    b. Review present and future needs of each entity present, including the following:
        1) Interface requirements.
        2) Sequence of operations.
        3) Review and note field observations, problems and decisions.
        4) Identify present problems and necessary resolutions.
        5) Contractors shall provide two (2) week look ahead schedules to be reviewed in conjunction with the project master schedule.
        6) Status of shop drawings & submittals.
        7) Product procurement & Deliveries.
        8) Off-site fabrication.
        9) Coordinate occupancy arrangements and access requirements with Owner as required.
        10) Site utilization.
        11) Temporary facilities and controls.
        12) Progress cleaning.
        13) Quality and work standards.
        14) Status of correction of deficient items.
        15) Field observations.
        16) Status of RFIs.
        17) Status of proposal requests.
        18) Pending changes.
        19) Status of Change Orders.
        20) Pending claims and disputes.
        21) Documentation of information for payment requests.
        22) Review of Safety issues
        23) Owner Issues
        24) Architect & Engineers Issues
        25) Open Discussion

26) Location and time for next meeting

3. Minutes: Construction Manager will record and distribute the meeting minutes to each party present and to parties requiring information through Procore.
   a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

E. Contractors are required to attend Progress Meetings. Unexcused absences from Progress Meetings will result in a deduct Change Order in the amount of $150.00 for each absence. Meeting attendees shall have the authority to make decisions on behalf of the firm they represent.

F. Coordination Meetings: Construction Manager will conduct Project coordination meetings at weekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and pre-installation conferences.
   1. Attendees: In addition to representatives of Owner, and Construction Manager, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.

   2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

      a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

      b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.

      c. Review present and future needs of each contractor present, including the following:
         1) Interface requirements.
         2) Sequence of operations.
         3) Status of submittals.
         4) Deliveries.
         5) Off-site fabrication.

6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Work hours.
10) Hazards and risks.
11) Progress cleaning.
12) Quality and work standards.
13) Change Orders.

3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting through Procore.

G. Project Closeout Conference: Construction Manager will schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, prior to the scheduled date of Substantial Completion for each construction phase.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.

2. Attendees: Authorized representatives of Owner, Program Manager, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
   a. Preparation of record documents.
   b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
   c. Submittal of written warranties.
   d. Requirements for preparing operations and maintenance data.
   e. Requirements for delivery of material samples, attic stock, and spare parts.
   f. Requirements for demonstration and training.
   g. Preparation of Contractor's punch list.
   h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
   i. Submittal procedures.
   j. Coordination of separate contracts.
   k. Owner's partial occupancy requirements.
   l. Installation of Owner's furniture, fixtures, and equipment.
   m. Responsibility for removing temporary facilities and controls.

4. Minutes: Construction Manager will record and distribute meeting minutes through Procore.

1.8 REQUESTS FOR INFORMATION (RFI’s)

A. Procedure: Immediately on discovery of the need for interpretation of Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI through Procore.

1. RFI's shall originate with Contractor and or Construction Manager.

2. Coordinate and submit RFI's in prompt manner to avoid delays in Contractor's work or work of subcontractors.

B. Content of RFI: Include detailed, legible description of item needing interpretation and following:

1. Project name. Date.
2. Name of Contractor.
3. Name of Architect and Construction Manager.
4. RFI number, numbered sequentially.
5. Specification Section number and title and related paragraphs, as appropriate.
6. Drawing number and detail references, as appropriate.
7. Field dimensions and conditions, as appropriate.
8. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
9. Contractor's signature.
10. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.

    a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.

C. Construction Management Software Generated RFI's (Procore): Software generated form with substantially same content as indicated above.

1. Attachments shall be electronic files in PDF format.

D. Architect's and Construction Manager's Action: Construction Manager and Architect will review each RFI, determine action required, and return it.

1. The following RFI's shall be returned without action:
    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for coordination information already indicated in Contract Documents.
    d. Requests for adjustments in Contract Time or Contract Sum.
    e. Requests for interpretation of Architect's actions on submittals.
    f. Incomplete RFI's or RFI's with numerous errors.

2. Construction Manager and Architect's action may include request for additional information, in which case Architect's time for response shall start again.

3. Construction Manager and Architect's action on RFI's that may result in change to Contract Time or Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."

   a. If Contractor believes RFI response warrants change in Contract Time or Contract Sum, notify Architect and Construction Manager in writing within five (5) days of receipt of RFI response.

E. On receipt of Architect's and Construction Manager's action, Construction Manager to update RFI log and immediately distribute RFI response to affected parties. Review response and notify Architect and Construction Manager within five (5) days if Contractor disagrees with response.

F. RFI Log: Construction Manager to prepare, maintain, and submit tabular log of RFI's organized by RFI number. Submit log weekly to Architect and Contractor.

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect and Construction Manager.
4. RFI number including RFI's that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's and Construction Manager's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.12 DAILY CONSTRUCTION REPORTS:

A. Contractor shall prepare and submit daily a DCR in Procore on the form provided in Procore by 9:00 AM of the next succeeding business day. This report shall contain as minimum information: The location and description of the work being performed, the contractors man hours and man count by craft and minority, AM and PM temperatures, starting and quitting time, material received, equipment on site, and sub-contractors working that day, inspections/testing, incidents, and any other impacts to project.

B. Safety Program

1. Contractor shall provide CM a copy of weekly "Toolbox Talks" meetings and any other safety meetings. These are to be saved in Procore on a weekly basis under "Tool Box Talks".

2. Refer to division 01 section 01 3523 "Safety Requirements" for additional Contractor safety reporting and requirements

C. Material/Equipment Status

1. Contractor shall prepare a material/equipment status report no later than forty-five (45) calendar days from the Contract Execution. The report shall include a complete list of suppliers, items to be purchased, fabricator and/or manufacturer, submittal date time required and deliver date for each item.

D. Reporting:

1. All reporting for this spec section from meeting minutes, reports, and coordination drawings to correspondence is to be disturbed through Procore. And shall be produced in the template(s) available in Procore (Construction Management Software) and distributed through Procore. All correspondence will be done through Procore (CMS).

1.13 PERSONNELL:

A. Supervision: Each Prime Contractor's project manager and field superintendent throughout project duration shall have five years' experience minimum in the proposed position.

1. Two (2) years minimum of the five (5) years' experience for position shall be with Prime Contractor's firm.

B. Should in the opinion of the Construction Manager, Architect, the project manager, superintendent or other Contractor's employees or subcontractor personnel prove unqualified for their position at any point in the project, the Construction manager shall issue a letter stating that the person is to be removed from involvement in the project.

1. Action must be made by Prime Contractor within seven working days of receipt of such letter.

C. Staff Names: At Preconstruction conference each Prime Contractor shall submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities. List business addresses and telephone numbers, including business office, field office, cellular, and facsimile. Each prime contractor shall submit a list of emergency contact names and phone numbers.

1. Post copies in Project meeting room, each temporary field office and at each temporary Telephone. Provide corresponding identification badge number for each staff listed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 003100 – PROJECT FORMS AND RELATED DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section lists the project forms used for administration of the project as well as documents used for administration and logistics

1.3 FORMS

A. The following forms are contained within the conditions of the contract section:
   1. SUBMITTAL LOG
   2. SUBMITTAL COVER
   3. REQUEST FOR INFORMATION (RFI)
   4. SUBSTITUTION REQUEST FORM

PART 2 -PRODUCTS (Not Applicable)

PART 3 - EXECUTION

1.4 PROCEDURES

A. LCS CONTRACTOR PREQUALIFICATION STATEMENT: A list of Company, staff, M/WBE Subcontracts, Management Identification, Financial Information, etc. to help with determination of capabilities.

B. SITE SPECIFIC SAFETY PLAN: How Contractor will address requirements for on-site safety.

C. SUBMITTAL LOG: A list of the submissions required. Refer to BIDDING REQUIREMENTS, Section entitled “INSTRUCTIONS TO BIDDERS” and Division 1, and Specification Section entitled “SUBMITTAL PROCEDURES” for submission procedures.

D. REQUEST FOR INFORMATION (RFI) FORM: This form is to be used for information requests. The form is to be filled out by any party to the contract and sent to the Architect. The Architect will number the RFI before processing.

E. SUBMITTAL COVER: The form is to be filled out by the Prime Contractor for each submittal and sent to the Architect in accordance with Division 01 Section “SUBMITTAL PROCEDURES”.

F. SUBSTITUTION REQUEST FORM: This document is to be used by a Prime Contractor to propose a substitution in accordance with Division 01Section “SUBSTITUTION PROCEDURES”.

G. CONTRACTOR CLOSE-OUT DOCUMENTATION CHECKLIST: This document is to be used by a Prime Contractor to Facilitate Close-Out procedures in accordance with Division 01 Section "CLOSEOUT PROCEDURES."

END OF SECTION 003100

SECTION 013113 - CONTRACT COORDINATION

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 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:

1. General coordination procedures.
2. Coordination drawings.
3. RFIs.
4. Digital project management procedures.
5. Web-based Project management software package.
6. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

C. Related Requirements:

1. Section 011000 "Summary of Work" for a description of the division of work among separate contracts and responsibility for coordination activities not in this Section.
2. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
3. Section 017200 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
4. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in Project meeting room, in temporary field office,and in prominent location in each built facility. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Coordination of Multiple Contracts: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its own operations with operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and scheduled activities of other contractors and direction of Project coordinator to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.6 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
b. Coordinate the addition of trade-specific information to coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
f. Indicate required installation sequences.

g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling, raised access floor, and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms, showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:

    a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    c. Fire-rated enclosures around ductwork.

7. Electrical Work: Show the following:

    a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
    b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
    c. Panel board, switchboard, switchgear, transformer, busway, generator, and motor-control center locations.
    d. Location of pull boxes and junction boxes, dimensioned from column center lines.

8. Fire-Protection System: Show the following:

a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

9. Review: Architect will review coordination drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."

C. Coordination Drawing Process: Prepare coordination drawings in the following manner:

1. Schedule submittal and review of Fire Sprinkler, Plumbing, HVAC, and Electrical Shop Drawings to make required changes prior to preparation of coordination drawings.
2. Commence routing of coordination drawing files with HVAC Installer, who will provide drawing plan files denoting approved ductwork. HVAC Installer will locate ductwork and piping on a single layer, using orange color. Forward drawings to Plumbing Installer.
3. Plumbing Installer will locate plumbing and equipment on a single layer, using blue color.
4. Fire Sprinkler Installer will locate piping and equipment, using red color. Fire Sprinkler Installer shall forward drawing files to Electrical Installer.
5. Electrical Installer will indicate service and feeder conduit runs and equipment in green color. Electrical Installer shall forward drawing files to Communications and Electronic Safety and Security Installer.
6. Communications and Electronic Safety and Security Installer will indicate cable trays and cabling runs and equipment in purple color. Communications and Electronic Safety and Security Installer shall forward completed drawing files to Contractor.
7. Contractor shall perform the final coordination review. As each coordination drawing is completed, Contractor will meet with Architect to review and resolve conflicts on the coordination drawings.

D. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:

1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
2. File Submittal Format: Submit or post coordination drawing files using PDF format.

3. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.

a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
b. Digital Data Software Program: Drawings are available in Revit 2019.

c. Contractor shall execute a data licensing agreement in the form of Agreement included in this Project Manual.

1.7 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Owner name.
3. Owner's Project number.
4. Name of Architect.
5. Architect's Project number.
6. Date.
7. Name of Contractor.
8. RFI number, numbered sequentially.
9. RFI subject.
10. Specification Section number and title and related paragraphs, as appropriate.
11. Drawing number and detail references, as appropriate.
12. Field dimensions and conditions, as appropriate.
13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
14. Contractor's signature.
15. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Form bound in Project Manual.

1. Attachments shall be electronic files in PDF format.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

a. Requests for approval of submittals.
b. Requests for approval of substitutions.
c. Requests for approval of Contractor's means and methods.
d. Requests for coordination information already indicated in the Contract Documents.
e. Requests for adjustments in the Contract Time or the Contract Sum.
f. Requests for interpretation of Architect's actions on submittals.
g. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 5 days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number, including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

1.8 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Use of Architect's Digital Data Files: Digital data files of Architect's BIM model will be provided by Architect for Contractor's use during construction.

1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project Record Drawings.
2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.

3. Digital Drawing Software Program: Contract Drawings are available in Revit 2019.
4. Contractor shall execute a data licensing agreement in the form of Agreement included in Project Manual.

    a. Subcontractors and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of Agreement included in this Project Manual.

B. Web-Based Project Management Software Package: Use Architect's web-based Project management software package for purposes of hosting and managing Project communication and documentation until Final Completion.

1. Web-based Project management software includes, at a minimum, the following features:

    a. Compilation of Project data, including Contractor, subcontractors, Architect, Architect's consultants, Owner, and other entities involved in Project. Include names of individuals and contact information.
    b. Access control for each entity for each workflow process, to determine entity's digital rights to create, modify, view, and print documents.
    c. Document workflow planning, allowing customization of workflow between project entities.
    d. Creation, logging, tracking, and notification for Project communications required in other Specification Sections, including, but not limited to, RFIs, submittals, Minor Changes in the Work, Construction Change Directives, and Change Orders.
    e. Track status of each Project communication in real time, and log time and date when responses are provided.
    f. Procedures for handling PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
    g. Processing and tracking of payment applications.
    h. Processing and tracking of contract modifications.
    i. Creating and distributing meeting minutes.
    j. Document management for Drawings, Specifications, and coordination drawings, including revision control.
    k. Management of construction progress photographs.
    l. Mobile device compatibility, including smartphones and tablets.

C. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:

1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.9 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of 10 working days prior to meeting.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

1. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

a. Responsibilities and personnel assignments.
b. Tentative construction schedule.
c. Critical work sequencing and long lead items.
d. Designation of key personnel and their duties.
e. Lines of communications.
f. Use of web-based Project software.
g. Procedures for processing field decisions and Change Orders.
h. Procedures for RFIs.
i. Procedures for testing and inspecting.
j. Procedures for processing Applications for Payment.
k. Distribution of the Contract Documents.
l. Submittal procedures.
m. Preparation of Record Documents.
n. Use of the premises and existing building.
o. Work restrictions.
p. Working hours.
q. Owner's occupancy requirements.
r. Responsibility for temporary facilities and controls.
s. Procedures for moisture and mold control.
t. Procedures for disruptions and shutdowns.
u. Construction waste management and recycling.
v. Parking availability.

w. Office, work, and storage areas.
x. Equipment deliveries and priorities.
y. First aid.
z. Security.
aa. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract Documents.
b. Options.
c. Related RFIs.
d. Related Change Orders.
e. Purchases.
f. Deliveries.
g. Submittals.
h. Review of mockups.
i. Possible conflicts.
j. Compatibility requirements.
k. Time schedules.
l. Weather limitations.
m. Manufacturer's written instructions.
n. Warranty requirements.
o. Compatibility of materials.
p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.
s. Regulations of authorities having jurisdiction.
t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

    a. Preparation of Record Documents.
    b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    c. Procedures for completing and archiving web-based Project software site data files.
    d. Submittal of written warranties.
    e. Requirements for preparing operations and maintenance data.
    f. Requirements for delivery of material samples, attic stock, and spare parts.
    g. Requirements for demonstration and training.
    h. Preparation of Contractor's punch list.
    i. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
    j. Submittal procedures.
    k. Coordination of separate contracts.
    l. Owner's partial occupancy requirements.
    m. Installation of Owner's furniture, fixtures, and equipment.
    n. Responsibility for removing temporary facilities and controls.

4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

E. Progress Meetings: Conduct progress meetings at biweekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

        1) Review schedule for next period.

    b. Review present and future needs of each entity present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Status of submittals.
        4) Deliveries.
        5) Off-site fabrication.
        6) Access.
        7) Site use.
        8) Temporary facilities and controls.
        9) Progress cleaning.
        10) Quality and work standards.
        11) Status of correction of deficient items.
        12) Field observations.
        13) Status of RFIs.
        14) Status of Proposal Requests.
        15) Pending changes.
        16) Status of Change Orders.
        17) Pending claims and disputes.
        18) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

    a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

F. Coordination Meetings: Conduct Project coordination meetings at weekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
    c. Review present and future needs of each contractor present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Status of submittals.
        4) Deliveries.
        5) Off-site fabrication.
        6) Access.
        7) Site use.
        8) Temporary facilities and controls.
        9) Work hours.
        10) Hazards and risks.
        11) Progress cleaning.
        12) Quality and work standards.
        13) Status of RFIs.
        14) Proposal Requests.
        15) Change Orders.
        16) Pending changes.

3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013150 - PROJECT SCHEDULE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary conditions and other Division 1 Specification Sections, apply to this Section.

1.1 SUMMARY

A. This section includes the Administrative and Supervisory requirements necessary for the development and updating of the project schedule and general project coordination.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Section 011000 - Summary of Work
2. Section 013100 – Project Coordination
3. Section 013300 - Submittals
4. Section 017700 – Contract Closeout

C. All Schedules produced for this project are to be electronically distributed through the construction management software program “Procore” and are to be saved in the documents folder under schedule.

1.2 CONSTRUCTION SCHEDULE

A. Time is of the Essence. The Work of this Project shall be substantially complete on or before the dates indicated in the attached Milestone Schedule. Commence Construction activities at the site as soon after contract award as required to comply with specified Milestone Schedule, unless otherwise specified in Milestone Schedule.

B. Contractors are to review the Milestone Schedule and the Phasing/Logistics plans to determine the general sequence of the work.

C. The Owners continuing occupancy and use of the building has been considered in determining the milestone dates.

D. The Milestone Schedule has been developed identifying critical completion dates for various major areas of the work required to achieve the final completion date and occupancy schedule.

E. Contractors are to assume that beneficial occupancy of various areas by the Owner is to occur immediately after Milestone Schedule dates of Substantial Completion.

F. Schedule material deliveries to correspond with starting dates so that materials are on site on required start dates.

1.3 MILESTONE SCHEDULE

MILESTONE ACTIVITY	DURATION / COMPLETION DATE

1.4 PROJECT SCHEDULE

A. Critical Path Method Scheduling Requirements

1. The General Trades Contractor will prepare a coordinated computerized Original Baseline Schedule base on the schedule input of the other Prime Contractors and their subcontractors. The Contractor shall designate a representative to be responsible for the CPM scheduling functions relative to their contract and such person shall be the liaison between the Construction Manager and the Contractor. The Contractors representative shall have direct project control and complete authority to act on the behalf of the Contractor in fulfilling the requirements of this specification section and such authority shall be continuous throughout the duration of the project.

2. Within 14 calendar days after Notice to Proceed, the Contractor shall provide an initial project schedule to the Construction Manager. The schedule shall be a comprehensive inventory of all work activities that will comprise the Contractors work on the project during the first 120 days of the project work window, commencing with notice to proceed. A second schedule submittal that encompasses **all** work activities for the project shall be forwarded to the construction manager not-later-than 45 days following notice to proceed. This second schedule submittal shall include all contract times, the project start and finish dates, submission and approval of all project deliverables, all required tasks in the procurement cycle (submission of submittals, approvals, fabrications, delivery to the site, inspections, etc.) All construction work tasks, project closeout tasks including punch list and equipment testing, and all responsible scheduling of subcontractors and suppliers. In preparing the project schedule, durations, predecessor and / or successor activity(s) phase codes, area

codes, responsibility codes, revenue/cost loading discretely by task and equipment and man-hour / manpower requirements, discretely by individual task. The scheduled tasks shall be of sufficient detail to provide a basis for coordination with: the owner, construction manager, all contractors and sub-contractors . Proper identification of project areas, drawing references and locations of work and descriptive references for equipment identification are requisite for schedule tasks. The project Work Breakdown Structure (WBS) shall be followed for the assemblage of the schedule and activity task grouping, with appropriate references to the project phasing. The CM will provide the WBS outline for the project. The project schedule shall be prepared using Primavera P6 software or other electronic method acceptable to the CM. The schedule shall be transmitted electronically (as an active document) and as a hard copy.

Special emphasis with an appropriate level of detail will be provided for instances or activities where temporary facilities or compensatory installations or removals are employed ***and*** there is a potential for: utility services interruption or impact to airport operations and / or impairing the health and safety of the public or violating applicable standards or building codes.

3. After receiving the initial scheduling information from the Contractor(s), the Construction Manager will develop a Preliminary CPM Schedule incorporating the schedule data provided. Any activity float time will be included in the Preliminary CPM Schedule at the discretion of the Construction Manager. The Preliminary CPM Schedule will be presented and discussed at a scheduling Meeting, called by the Construction Manager, and attended by the Contractor(s). At this meeting, the Contractor, will explain the Preliminary CPM Schedule in detail. During the presentation, the Contractor(s) shall indicate their views, their approval or shall request changes. The Schedule that is generally compatible with the proposed activities and requirements of the Contract Document and which have been agreed to previously by the contractor.

4. After the Scheduling Meeting, the Contractor will produce an Integrated Baseline schedule. . The Contractor(s) will sign the original of the network diagram indicating their approval of the Integrated Baseline Schedule. It will be the responsibility of the Contractor(s) to insure that all of their work is incorporated into the Integrated Baseline Schedule and that it correctly represents the means, methods, techniques, sequence, and precedence in which they plan to complete the work.

5. Once the Integrated Baseline Schedule is approved by the Contractor(s), it will be used as the basis to monitor schedule progress. At the end of each calendar month, the Contractor(s) will review the Integrated Baseline Schedule with the Construction Manager. Prior to this meeting, the Contractor(s), shall prepare an activity status report detailing each activity in progress, giving percentage completed, remaining duration, summary of delays in starting or finishing and activity, etc. The activity status report will

be prepared utilizing MS excel and transmitted electronically to the Construction Manager. In this report the Contractor shall also indicate what steps are being taken to correct all delaying conditions. Based on this information, the Construction Manager will prepare an update to the Integrated Baseline Schedule.

6. In the event that the updated Integrated Baseline Schedule indicates that the Contractor has been delayed in prosecution of their work, and that this has impacted the critical path, the Contractor may either request an Extension of Time or will be required to recover the lost time. Any request for an Extension of Time must contain a CPM based schedule analysis; performed by the Contractor and showing in a detail that is satisfactory to the Construction Manager, the impact of the delay to the critical path and the project milestones. Based on this analysis, the Construction Manager may either grant the Extension of Time or require a recovery plan. The Construction Manager may elect to perform additional analysis as deemed necessary to assure project milestone dates are met. If requested, the recovery plan will show, in such detail as is acceptable to the Construction Manager, the Contractors plan to meet all schedule project milestones, and that all work will be completed within the time frame stipulated in the Contract documents. Explanations of schedule recovery may include items such as adding hours, working though holiday and weekends; change in means and methods, or revision the overall sequencing logic of the Integrated Baseline Scheduled to adjust the critical path.

1. Prime Contractor shall coordinate through the Construction Manager, the scheduling of their work with the other consultants, contractors, subcontractors and sub-subcontractors so that the project is completed on schedule with minimum interference to the Owners operation and educational schedule.

2. The Milestone Schedule dates being part of this Contract, shall be the basis for the Contractor's detailed schedule.

3. All completion dates shown shall be within the period specified for contract completion, and in compliance with all intermediate milestones. The project schedule shall show the sequence and interdependence of activities required for complete performance.

4. It is intended that the coordinated project schedule reflect the Contractors' actual plan of operation for their prosecution of the work. Revisions, expansions and modifications to each of the Contract activities, will be at the direction of the contractor whose work is affected. This project schedule may need to be revised to accommodate work interfaces between the contractors. Once the affected contractors have agreed upon these revisions, the Prime General Contractor will incorporate these revisions into the schedule. All contractors agree that the coordinated project schedule is the designated plan for completion of all work in the allotted time, and each contractor will assume full responsibility for the prosecution of the work as shown.

5. Upon completion of the coordinated project schedule, all contractors agree that this schedule is the designated plan for completion of all work in the allotted time, and each contractor will assume full responsibility for the prosecution of the work as shown. All contractors shall indicate formal acceptance of the schedule by signing the finalized precedence diagram and computer schedule listings.

6. Coordinate the contractors' construction schedule with the Schedule of Values, List of Subcontracts, Submittal Schedule, Progress Reports, Payment Requests and other schedules.

7. Work completion should be scheduled and achieved in advance of the date established for substantial completion to allow time for the Architects procedures necessary to certify substantial completion.

8. Schedule all construction activities at the Site through the Construction Manager to avoid interference with Owner's operations and to meet specified completion dates. It is the responsibility of all Prime Contractors to meet Completion Schedules with the Owner's Educations Schedule.

9. Activity ID Numbers - Each activity id number shall be unique. Once the detailed project schedule has been approved and designated as a baseline project schedule, each activity id number created in the detailed project schedule will remain the same and shall not be reassigned a different activity id or different activity description which would change the intended scope of work.

10. Activity Description - Each activity shall be described in sufficient detail as to fully describe the work to be performed. Generic terms or description will not be accepted. Hammocks and milestones shall be clearly indicated (it is suggested that abnormally large activities be broken down by physical locations or another identifiable and acceptable sub-division.

B. Project Schedule Progress Update

1. The contractor shall furnish the Construction Manager with an updated detailed schedule monthly, at the time that the progress payment request is presented. The updated schedule shall indicate progress to date for each activity, including all changes. Any activities or dates that have been added, deleted or modified shall be circled to highlight the change. The contractor shall provide detailed reasons for changes and their effects.

2. Updated manpower and man-hours forecasts for the work, numerically and graphically by month and by craft, shall be submitted monthly with the monthly updated schedule presented at that time.

3. If the contract completion or other critical milestone dates are forecast as being later than the date specified in the contract, the contractor shall submit a recovery plan by which he proposes to bring the work back on

schedule. The plan shall indicate revised manpower and equipment/material requirements.

4. If the contractor misses any of the contract milestones, a recovery plan shall be submitted to the Construction Manager within 72 hours. The plan shall indicate increased manpower/equipment loading, use of premium time, and required modifications to other activities. The plan shall indicate intermediate schedule activity dates to allow monitoring of the recovery.

5. The Contractor's Superintendent shall attend weekly coordination and scheduling meetings held by the Construction Manager at the jobsite. Weekly work plans shall be submitted to the Construction Manager prior to the meeting. If the Contractor desires to revise the logic of the approved coordinated project schedule so as to reflect a sequence of construction that differs from that originally agreed to, he must first obtain the approval of the Construction Manager and all Contractors whose work may be affected by the changes. If this change extends the completion date of the project or delays the work of other trades, the contractor agrees that these impacts and all associated costs will be assessed against the contractor initiating the change and will not be the basis for a project time extension.

6. Work as represented by the detailed project schedule shall be broken into easily identifiable work activities including: contractor activities; subcontractor activities; procurement activities; engineering activities; construction activities as well as any Construction Manager, Architect and owner's activities. These activities shall be described in sufficient detail as to clearly communicate all phases, sequences, steps and scope of work to be performed on the project. Ninety percent (90%) of all work activities must not exceed four (4) weeks in duration unless approved by the Construction Manager. In no case should any activity exceed two (2) months in duration unless approved by the Construction Manager. Procurement activities will include all major hold points and separate the delivery process from manufacturing or fabrication process. All milestone dates, included as an attachment to this specification, shall be included in the detailed project schedule as a milestone and shall be titled "key project milestone."

7. The project schedule will be composed of detailed activities logically tied together. A detailed activity shall have the following six attributes: a] has a clearly defined starting point. b] performance can be easily measured during the performance of the work. c] has a clearly defined completion. d] has tasks or activities with tangible deliverables that represent the work to be performed. e] provides a single source of responsibility or ownership (sub contract activities are the prime contractor's responsibility). f] each detailed activity will be assigned a duration in days, or hours (at direction of CM) to perform the work.

8. Schedule Updates - The contractor will provide update information for the "schedule of record" which is maintained by the Construction Manager. The contractor shall provide update data for the detailed schedule not less than once weekly ("weekly update"). The weekly update shall include all

required reports specified herein that are necessary for maintaining the detailed schedule and any earned value reporting required or desired. Each weekly update will show the actual and projected start dates for all work activities, actual and projected finish dates, all logic revisions, and the activity percent complete.

9. Physical Percent Complete - All schedule tasks will status progress using physical percent complete. Physical percent complete will be calculated based on actual progress as measured by work effort or by measurable quantities. When requested by the Construction Manager, the contractor will provide information and backup support to validate methods used to develop physical percent complete. In no case will physical percent complete be based solely on remaining durations compared to original durations or actual expenditures compared to budgeted expenditures. All significant reductions in physical percent complete will be reported in the weekly report along with a written explanation for the changes.

10. Weekly Schedule Update - The contractor will update the “schedule of record” which is maintained by the Construction Manager. Contractor shall update the detailed project schedule not less than once weekly (“weekly update”). Updates will include actual starts, actual finishes, remaining durations, physical percent completions, and any other status items required by the Construction Manager to be included in the log feature of each activity. The exact timing of the weekly schedule update will be determined by the Construction Manager. Once approved, the contractor will be responsible to notify the Construction Manager of any party or parties not within the contractor’s control who have been identified as being responsible for items in the schedule and who have not provided the schedule input as required.

11. Monthly Reporting - Each month, the contractor shall provide a more in-depth and detailed status report indicating the overall status of the work, major or significant changes made to the schedule, problem areas, recovery plans, unresolved issues, change orders and their effect on the work progress, and manpower availability. The monthly status report must also include contractor’s reports showing planned, earned, and actual man hours.

1.5 TWO WEEK LOOK AHEAD SCHEDULE

A. All Prime Contractors shall provide a two-week “look ahead” activity schedule for coordination of immediate construction activities.

B. The two-week schedule is to be updated weekly.

C. The two-week schedule is to include:
   1. All critical coordination activity
   2. The parent activity ID from the Integrated Project Baseline schedule

3. Reference to next project milestones
4. New activities scheduled to commence during the period
5. Key activities scheduled to be completed during the period
6. All utility shutdown requirements or planned services interruptions
7. Owner operations impact or Site accessibility events
8. Highlighted variances from the previous two-week schedule

D. The Two-week schedule shall be reviewed at the weekly Coordination Meeting. All critical issues are to be identified for coordination. The Construction Manager will coordinate items involving the Owners' operations.

E. Information derived from the two-week schedule is to be utilized in the maintenance of the Contractor's detailed schedule.

1.5 CONTRACTOR USE OF PREMISES

A. Refer to Division 1 for additional requirements and provisions regarding Contractor's use of premises.

B. Access to Building - All Prime Contractors: Schedule all construction activities with Owner through Construction Manager to allow Owner's full use of building areas and systems for normal educational process.

C. Owner acknowledges Prime Contractors will require access to Owner-occupied areas, rooms, and systems, and intends to cooperate in making rooms and systems available for construction activities during un-occupied hours.

D. Notify Construction Manager in advance of any requirements for access to any existing building outside normal working hours and days. Planned activities that interrupt services will be scheduled in advance with the construction manager with an acceptable allowance of time for review and approval by the CM, A/E, and the owner. The activity(s) once reviewed and approved will be entered on the two-week-forecast for coordination visibility.

E. Building Security: Contractor will maintain building security and life safety systems at all times. Each Prime Contractor retains full responsibility for security and protection of Work of his Prime Contract and the non-interruption of owners health & safety, and security systems until project final acceptance by Owner.

F. Maintenance of Building Circulation and Exits: Maintain circulation corridors, exits, egress windows and exit stairs unobstructed from equipment and materials, except in defined areas of construction activity. Enclose temporary corridors and exits with temporary partitions.

1.6 OWNER OCCUPANCY

A. Refer to Division 1 for additional requirements and provisions regarding Owner occupancy.

B. Normal Operations - Owner intends to maintain a full aviation operations program throughout duration of the Project, and will make full use of buildings and sites,

unless otherwise specified.

C. School Operations and special activities may be conducted within buildings and on sites after regular operation hours and on weekends during the duration of the project.

D. All Prime Contractors shall maintain free access by Owner's personnel to building and site areas not scheduled for alteration or dimensional change. Free access by the public to normally public areas and facilities of the school will be supported by the contractor(s).

E. Owner's personnel will perform normal custodial and maintenance services for building areas and systems not involved in construction activities, unless otherwise indicated.

1.6 REPORTING

A. Baseline schedule and all updated schedules that are issued for the project are to be distributed through Procore and saved in Procore under the documents tab in the schedule folder.

END OF SECTION 01 3150

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

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 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Preliminary construction schedule.
2. Contractor's construction schedule.
3. Daily construction reports.
4. Material location reports.
5. Site condition reports.
6. Special reports.

B. Related Requirements:

1. Section 011000 "Summary" for preparing a combined Contractor's construction schedule.
2. Section 013300 "Submittal Procedures" for submitting schedules and reports.
3. Section 014000 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Event: The starting or ending point of an activity.

E. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

F. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:
1. PDF electronic file.

B. Startup construction schedule.

C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.

D. Daily Construction Reports: Submit at weekly intervals.

E. Material Location Reports: Submit at weekly intervals.

F. Site Condition Reports: Submit at time of discovery of differing conditions.

G. Special Reports: Submit at time of unusual event.

1.5 QUALITY ASSURANCE

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request.

B. Rescheduling Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:

1. Review software limitations and content and format for reports.
2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including phasing, work stages, area separations, interim milestones and partial Owner occupancy.
4. Review delivery dates for Owner-furnished products.
5. Review schedule for work of Owner's separate contracts.
6. Review submittal requirements and procedures.
7. Review time required for review of submittals and resubmittals.
8. Review requirements for tests and inspections by independent testing and inspecting agencies.
9. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
10. Review and finalize list of construction activities to be included in schedule.
11. Review procedures for updating schedule.

1.6 COORDINATION

A. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for commencement of the Work to date of Final Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows a completion date other than the contractual completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
4. Startup and Testing Time: Include time for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
6. Punch List and Final Completion: Include adequate time for completion of punch list items and final completion.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

    a. Coordination with existing construction.
    b. Limitations of continued occupancies.
    c. Uninterruptible services.
    d. Partial occupancy before Substantial Completion.
    e. Use of premises restrictions.
    f. Provisions for future construction.
    g. Seasonal variations.
    h. Environmental control.

    2. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:

        a. Subcontract awards.
        b. Submittals.
        c. Purchases.
        d. Mockups.
        e. Fabrication.
        f. Sample testing.
        g. Deliveries.
        h. Installation.
        i. Tests and inspections.
        j. Adjusting.
        k. Curing.
        l. Startup and placement into final use and operation.

    3. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area

must be sequenced or integrated with other construction activities to provide for the following:

a. Structural completion.
b. Temporary enclosure and space conditioning.
c. Permanent space enclosure.
d. Completion of mechanical installation.
e. Completion of electrical installation.
f. Substantial Completion.

D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.

E. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.

1. See Section 012900 "Payment Procedures" for cost reporting and payment procedures.

F. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:

1. Unresolved issues.
2. Unanswered Requests for Information.
3. Rejected or unreturned submittals.
4. Notations on returned submittals.
5. Pending modifications affecting the Work and Contract Time.

G. Recovery Schedule: When periodic update indicates the Work is 5 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.

H. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.2 PRELIMINARY CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within seven days of date established for commencement of the Work.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 30 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within 10 days of date established for the Notice of Award. Base schedule on the startup construction schedule and additional information received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.4 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (see special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Construction Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial completions and occupancies.
19. Substantial Completions authorized.

B. Material Location Reports: At weekly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:

1. Material stored prior to previous report and remaining in storage.
2. Material stored prior to previous report and since removed from storage and installed.
3. Material stored following previous report and remaining in storage.

C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.5 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At WEEKLY intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate final completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 01 32 26 - CONSTRUCTION PROGRESS REPORTS

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 00 and 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
   1. Submittals Schedule.
   2. Daily construction reports.
   3. Field condition reports.

B. Related Sections include the following:
   1. Division 01 Section "Construction Procedures and Control" for submitting and distributing meeting and conference minutes.
   2. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
   3. Division 01 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 SUBMITTALS

A. Submittals Schedule: Refer to “Submittal Procedures” section of Project Manual.

B. Construction Reports: Submit one (1) copy daily. Reports need to be submitted by 9:00 a.m. of the day following the day of the report.

C. Field Condition Reports: Submit two (2) copies at time of discovery of differing conditions.

1.4 QUALITY ASSURANCE

A. Pre-scheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Construction Procedures and Control."
   1. Review time required for review of submittals and re-submittals.
   2. Review requirements for tests and inspections by independent testing and inspecting agencies.
   3. Review time required for completion and startup procedures.

1.5 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Refer to Division 01 Section “Submittal Procedures”.

2.2 REPORTS

A. Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Construction Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial Completions and occupancies.
19. Substantial Completions authorized.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

END OF SECTION 01 32 26

SECTION 01 33 00 - SUBMITTAL PROCEDURES

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 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Requirements:

1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.4 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.

2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

    a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

4. Format: Arrange the following information in a tabular format:

    a. Scheduled date for first submittal.
    b. Specification Section number and title.
    c. Submittal category: Action; informational.
    d. Name of subcontractor.
    e. Description of the Work covered.
    f. Scheduled date for Architect's final release or approval.
    g. Scheduled date of fabrication.
    h. Scheduled dates for purchasing.
    i. Scheduled dates for installation.
    j. Activity or event number.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals.

1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project Record Drawings.

    a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
    b. Digital Drawing Software Program: The Contract Drawings are available in AutoCAD Architecture 2014.
    c. Contractor shall execute a data licensing agreement in the form of Agreement included in Project Manual.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Architect reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 10 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. The Architect/Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 10 days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.

D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.

    a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.

4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:

    a. Project name.
    b. Date.
    c. Name and address of Architect.
    d. Name of Contractor.
    e. Name of firm or entity that prepared submittal.
    f. Names of subcontractor, manufacturer, and supplier.
    g. Category and type of submittal.
    h. Submittal purpose and description.
    i. Specification Section number and title.
    j. Specification paragraph number or drawing designation and generic name for each of multiple items.
    k. Drawing number and detail references, as appropriate.
    l. Location(s) where product is to be installed, as appropriate.
    m. Related physical samples submitted directly.
    n. Indication of full or partial submittal.

o. Transmittal number, numbered consecutively.
p. Submittal and transmittal distribution record.
q. Other necessary identification.
r. Remarks.

5. Metadata: Include the following information as keywords in the electronic submittal file metadata:

a. Project name.
b. Number and title of appropriate Specification Section.
c. Manufacturer name.
d. Product name.

E. Options: Identify options requiring selection by Architect.

F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Provide electronic submittals as PDF electronic files directly to **CM**.
2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
b. Provide a notarized statement on original paper copy certificates and certifications where indicated.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

a. Manufacturer's catalog cuts.
b. Manufacturer's product specifications.
c. Standard color charts.
d. Statement of compliance with specified referenced standards.
e. Testing by recognized testing agency.
f. Application of testing agency labels and seals.
g. Notation of coordination requirements.
h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

a. Wiring diagrams showing factory-installed wiring.
b. Printed performance curves.
c. Operational range diagrams.
d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before or concurrent with Samples.
6. Submit Product Data in the following format:

a. PDF electronic file.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

a. Identification of products.
b. Schedules.
c. Compliance with specified standards.
d. Notation of coordination requirements.
e. Notation of dimensions established by field measurement.
f. Relationship and attachment to adjoining construction clearly indicated.

g. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least **8-1/2 by 11 inches, but no larger than 24 by 36 inches**.
3. Submit Shop Drawings in the following format:

a. PDF electronic file.

D. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."

E. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."

F. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."

G. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."

H. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."

I. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."

J. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

K. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

L. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

M. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

N. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

O. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

P. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

Q. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

R. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

S. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

T. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

U. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

V. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. General: The Architect will not accept submittals that do not bear the Contractor's approved stamp.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
1. Reviewed.
2. Furnish as noted.
3. Revise and resubmit.
4. Rejected.

C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Partial and Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 013300

SECTION 01 35 00 - ELECTRONIC DOCUMENT TRANSFER

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Work of this Section shall be performed in accordance with the requirements of the Contract Documents, including but not limited to Instructions to Bidders, Agreement and General Conditions and General Requirements

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for the request and transfer of electronic documents from the Architect/Engineer to the Contractor, Subcontractors and the associated Equipment Vendors.

B. Electronic Documents include, but are not limited to, the following:
   1. Drawings in .pdf and AutoCAD .dwg format
   2. Specifications and printed documents in .pdf format.

C. Transfer of documents includes, but is limited to, the following:
   1. E-mail attachments.
   2. A/E's FTP site.

D. All drawings, specifications or other documents of any kind prepared by the Architect/Engineer or its subconsultants, whether in hard copy or any electronic or machine readable format, including Electronic Documents are, and shall remain, instruments of their services. These Instruments of Services were prepared solely for use in connection with this Project. The Architect/Engineer and its subconsultants retain all common law, statutory and other reserved rights, including the copyright.

E. The Electronic Documents are provided as a convenience to the Contractor for informational purposes only in connection with the Contractor's performance of its responsibilities and obligations relating to the Project. The Electronic Documents do not replace or supplement the paper copies of the Drawings and Specifications which are, and remain, the Contract Documents for the Project or the paper copies of any other document prepared by the Architect/Engineer or its subconsultants.

F. If any differences exist between printed Instruments of Services and the Electronic Documents, the information contained in the printed documents shall be presumed to be correct and shall take precedence over the Electronic Documents.

G. Contractor agrees and understands that field conditions may alter or modify the configuration, products, materials, and installation of the information shown on the electronic documents. Contractor shall be fully responsible to verify all field conditions and if applicable to modify the electronic documents to the actual conditions prior to use of the documents. These documents are provided as a convenience only, and do not change the responsibility of the Contractor as outlined in the Drawings and Specifications.

H. Architect/Engineer will not be responsible for, or required to provide assistance to the Contractor in the plotting or printing of any documents.

1.3 ELECTRONIC DOCUMENT TRANSFER PROCEDURES

A. Coordination: Coordinate transfer requests with performance of construction activities. Transmit each request to the CM and A/E sufficiently in advance of scheduled needs to avoid delay.
   1. Processing: To avoid the need to delay installation as a result of the time required to process document transfers:
      a. Allow 10 working days for the A/E's processing of each request, after receipt of a written request and the required processing fee.
      b. The A/E will not authorize an extension of time because of the Contractor's failure to transmit requests and fees to the A/E sufficiently in advance of the Work to permit processing.

B. Electronic Document Transfer Requests: Contractor shall submit a written request for any transfer consisting of the following:
   1. Signed, completed copy of the attached "Electronic Document Transfer Agreement".
   2. List of drawing numbers and titles requested.

END OF SECTION 01 35 00

SECTION 014000 - QUALITY REQUIREMENTS

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 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.
4. Specific test and inspection requirements are not specified in this Section.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and

to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of **five** previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 ACTION SUBMITTALS

A. Shop Drawings: For mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.

1. Indicate manufacturer and model number of individual components.
2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.6 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For Contractor's quality-control personnel.

C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within **10** days of **Notice of Award**, and not less than **five** days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions,

tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.

B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.

1. Project quality-control manager **may also serve as Project superintendent**.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:

1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
3. Owner-performed tests and inspections indicated in the Contract Documents**, including tests and inspections indicated to be performed by the Commissioning Authority**.

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.

F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.8 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.

8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.9 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in 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 the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to **ASTM E 329**; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

a. Provide test specimens representative of proposed products and construction.
b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
f. When testing is complete, remove test specimens, assemblies, **and** mockups; do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect **and Commissioning Authority**, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.10 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor**, and the Contract Sum will be adjusted by Change Order**.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

    a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

3. Notify testing agencies at least **24** hours in advance of time when Work that requires testing or inspecting will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents **as a component of Contractor's quality-control plan**. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.

1. Distribution: Distribute schedule to Owner, Architect, **Commissioning Authority,** testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's **and Commissioning Authority's** reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

SECTION 015000 - TEMPORARY FACILITIES & CONTROLS-MULTIPLE PRIME CONTRACTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection.

B. Temporary utilities include, but are not limited to, the following:

1. Water service and distribution.
2. Temporary electric power and light.
3. Temporary heat.
4. Ventilation and Humidity Control
5. Telephone service.
6. Sanitary facilities, including drinking water.
7. Storm and sanitary sewer.

C. Support facilities include, but are not limited to, the following:

1. Field offices and storage containers.
2. Temporary roads and paving.
3. Dewatering facilities and drains.
4. Temporary partitions and enclosures.
5. Hoists and temporary elevator use.
6. Temporary project identification sign and project signage.
7. Waste disposal services and dumpsters.
8. Construction aids and miscellaneous services and facilities.

D. Security and protection facilities include, but are not limited to, the following:

1. Temporary fire protection.
2. Barricades, warning signs, and lights.
3. Environmental protection.
4. Tree and plant protection.
5. Security enclosure and lockup.
6. Temporary enclosures.
7. Temporary partitions.
8. Sidewalk Bridge for maintaining legal exits.
9. Enclosure fence for the work site.

1.2 INFORMATIONAL SUBMITTALS

A. Temporary Utilities: Each prime contractor shall submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.

B. Implementation and Termination Schedule: Within 15 days of the date established for submittal of the Contractor's Construction Schedule, each prime contractor shall submit a schedule indicating implementation and termination of each temporary utility for which the Contractor is responsible.

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

D. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent

E. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

F. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage, including delivery, handling, and storage provisions for materials subject to water absorption or water damage, discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water damaged Work.
   1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
   2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
   3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

G. Dust-Control: Submit coordination drawing and narrative that indicates the dust-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
   1. Locations of dust-control partitions at each phase of the work.
   2. Location of proposed air filtration system discharge.
   3. Other dust-control measures.
   4. Waste management plan.

H. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.3 DEFINITIONS

A. Temporary Enclosure: As determined by Architect, temporary roofing is complete, insulated, all exterior wall openings are closed with temporary closures.

B. Permanent Enclosure: As determined by Architect, permanent roofing is complete, insulated, and weather tight; exterior walls are insulated and weather tight; and all openings are closed with permanent construction or substantial temporary closures.

C. Temporary Facilities: Construction, fixtures, fittings, and other built items required to accomplish the work, but which are not incorporated into the finished work.

D. Temporary Utilities: A type of temporary facility, primary sources of electric power, water, natural gas supply, etc., obtained from public utilities, other main distribution systems, or temporary sources constructed for the project, but not including the fixtures and equipment served.

E. Temporary Services: Activities required during construction, which do not directly accomplish the work.

1.4 QUALITY ASSURANCE

A. Regulations: The contractor shall comply with industry standards and with applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
   1. Building code requirements.
   2. Health and safety regulations.
   3. Utility company regulations.
   4. Police, fire department and rescue squad rules.
   5. Environmental protection regulations.

B. Standards: The Contractor shall comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations," ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library "Temporary Electrical Facilities."

C. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with the normal application of trade regulations and union jurisdictions.

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

1.5 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction. These utilities may not be available, refer to Summery of work for scope.

1. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
2. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
3. Gas Service from Existing System: Gas Service from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

B. Cost or use charges for temporary facilities are not chargeable to the Owner or the Architect. The Architect will not accept a prime contractor's cost or use charges for temporary services or facilities as a basis of claim for an adjustment in the Contract Sum or the Contract Time.

C. Other entities using temporary services and facilities include, but are not limited to, the following:

1. Other nonprime contractors.
2. The Owner's work forces.
3. The Construction Manager
4. Occupants of the Project.
5. The Architect.
6. Testing agencies.
7. Personnel of government agencies.

1.6 DIVISION OF RESPONSIBILITIES

A. General: These Specifications assign each prime contractor specific responsibilities for certain temporary facilities used by other prime contractors and other entities at the site. The Contractor for Site work is responsible for providing temporary facilities and controls that are not normal construction activities of other prime contractors and are not specifically assigned otherwise by the Architect and Construction Manager.

B. **EACH PRIME CONTRACTOR** is responsible for the following:

1. Installation, operation, maintenance, and removal of each temporary facility usually considered as its own normal construction activity, as well as the costs and use charges associated with each facility.
2. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
3. Its own field office, complete with necessary furniture, utilities, and telephone service.
4. Its own storage containers for tools and storage of materials not incorporated into the building construction.
5. Dewatering for their own construction operations.
6. Collection and disposal of its own hazardous, dangerous, unsanitary, or other harmful waste material.
7. Collection of its waste material and transporting to a dumpster.
8. Secure lockup of its own tools, materials, and equipment.
9. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.

C. The Contractor for **General Construction** is responsible for the following:
1. Snow and ice removal from all site construction areas.
2. Barricades, warning signs, and lights related to the building work
3. Temporary toilets, including disposable supplies.
4. Temporary wash facilities, including disposable supplies
5. Temporary partitions indicated on drawings or specifically called for in specifications, required for project phasing or necessary to perform the work. Excluding work of the abatement contractor.
6. General disposal of wastes for all prime contracts from the renovated building areas including costs for dumpsters. Mechanical contractor will be responsible for procuring a dumpster to dispose of mechanical equipment as indicated in Multi Prime Contractor.
7. Security enclosure and lockup.
8. Project directional signage and safety signage.
9. Project description sign
10. Creating a controlled access zone
11. Providing overhead protection at all entry doors withing 30 feet of demo operations.
12. Providing labor for street work, coordination, and deliveries. Provide signs and flags as required.
13. Provide temp power and lighting for all work under this contract during power shut down. This includes temp generator, cordless power tools, and stand lighting sufficient to light the area of work.
14. During shut down provide temp heating or cooling for this trade scope and all trade scope under this contract.

15. Site barricades, silt fence around site and stock piles. Dumpsters for site work.
16. Waste and water connections to the street and or site utility
17. Grading of site including seed and topsoil

D. The **Electrical Contractor** is responsible for the following:
1. Temporary lighting in accessible areas during power shut down.
2. Electric Power Service: Provide power by generator to owners fire alarm, IT Equipment, Security System and School refrigerator/freezer storage system until permanent service is returned for each school. Include 15 temp outlets for all trades use during shut down at each school at central locations on each floor.

E. The **Mechanical Contractor** is responsible for the following:
1. Mechanical contractor will be responsible for procuring a dumpster to dispose of mechanical equipment as indicated in Multi Prime Contractor Summary.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Each prime contractor shall provide new materials. If acceptable to the Construction Manager, undamaged, previously used materials in serviceable condition may be used. Provide materials suitable for use intended.

B. Lumber and Plywood: Comply with requirements in Division 6 Section "Rough Carpentry."

1. For job-built sheds within the construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding. Metal is an option as well.
2. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8-inch-thick exterior plywood.

C. Gypsum Wallboard: Provide 5/8 type x gypsum wallboard on interior walls of temporary offices or temporary partitions.

D. Roofing Materials: Provide UL Class A standard-weight asphalt shingles or UL Class C mineral-surfaced roll roofing on roofs of job-built temporary offices, shops, and sheds.

E. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.

F. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.

G. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.

H. 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.

I. Water: Provide potable water approved by local health authorities.

J. Pole driven Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 8 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide galvanized-steel bases for supporting posts.

K. Open-Mesh Fencing: Provide 0.12-inch- thick, galvanized 2-inch chain link fabric fencing 8 feet high and galvanized steel pipe posts, 1-1/2 inches I.D. for line posts and 2-1/2 inches I.D. for corner posts.

L. All temp fencing to have black wind screen secured on all sides of fencing.

M. Each temp fence enclosure to have double gates same height of fence with gate lock, chain and pad lock.

2.2 EQUIPMENT

A. General: Each prime contractor shall provide new equipment. If acceptable to the Construction Manager, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.

B. Water Hoses: Provide 3/4-inch heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

C. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.

D. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered-glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.

F. Heating and ventilating units: Provide temporary heating and ventilating units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.

1. Air Filtration Units: HEPA primary and secondary filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

G. Temporary Toilet Units: The **General Contractor** shall provide self-contained, single-occupant toilet units of the chemical, aerated recirculation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material. One unit per ten workers on site. Provide one separate handicap toilet unit for the use of the construction manager and one separate unit of women on site. Includes costs to provide construction managers trailer with an operational bathroom. Provide separate handicap temp toilet to be locked and used separate for construction manager.

H. Fire Extinguishers: **Each prime contractor** will provide hand-carried, portable, UL-rated; Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.

1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

2.3 TEMPORARY SUPPORT FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Temporary Field Offices: **Each prime contractor** shall provide its own prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.

C. General contractor to provide labor to clean and dispose of garbage from construction managers trailer once a week.

D. The electrical contractor to provide power to General Contractor, Mechanical Contractor and its own trailer service.

E. The General contractor to provide water to temp trailers and services.

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 TEMPORARY UTILITIES

PART 3 - EXECUTION

3.1 INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Each prime contractor shall provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required. Refer to site logistics plan for temp facility locations.

B. The contractor shall provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

C. Drinking-Water Facilities: Each Contractor shall provide containerized, tap-dispenser, drinking-water units, including paper cup supply for its own manpower.

D. Temporary Lighting:

1. **The Electrical Contractor** will install and operate temporary lighting that will fulfill security and protection requirements without operating the entire electrical system. Provide temporary lighting that will provide adequate illumination for construction operations and traffic conditions during shut down for each affected school.
2. Operate temporary lighting that will fulfill security and protection requirements without operating the entire system. Provide temporary lighting that will provide adequate illumination for construction operations and traffic conditions.
    a. Security lighting for building exteriors shall be continuously operational and maintained.
3. Temporary lighting shall be maintained in accordance with OSHA standards for power and foot candle levels in all areas while workers occupy the space
4. **The Electrical Contractor** will provide temporary lighting in the areas of renovation where the existing fixtures have been removed and the new lighting has not been installed

E. Isolation of Work Areas: Prevent dust, fumes, and odors from entering outside our work areas.
   1. Each Contractor will perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

3.3 SUPPORT FACILITIES INSTALLATION

A. **Each prime contractor** will locate field offices, storage trailers, sanitary facilities, and other temporary construction and support facilities for easy access. Locations to be coordinated with Construction Manager who will coordinate with owner. Facilities will not be allowed to be placed without district approval.

   1. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.

   2. Refer to the phasing plans for locations of storage trailers

B. Storage trailers/ containers: If required, **each prime contractor** will install storage containers equipped to accommodate materials and equipment involved. Storage trailers are to be located at each site in the designated staging areas located on the phasing plans.

C. Dewatering Facilities and Drains: **Each Contractor** will comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
   1. **The General Contractor** will remove snow and ice as required to minimize accumulations only at affected work area.
   2. **The General Contractor** will provide Maintenance of grass within the construction fences.

D. **Each Prime contractor** will provide waste-collection containers in sizes adequate to handle waste from construction operations for their own work to be performed
   1. Comply with requirements of authorities having jurisdiction. Comply with Division 01 Section "Execution" for progress cleaning requirements.

E. Temporary Lifts and Hoists: **Each prime contractor** will provide facilities for hoisting materials and employees.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Temporary Facility Changeover: Except for using permanent fire protection as soon as available, do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion, or longer, as requested by the Architect.

B. Protection of Existing Facilities: Each contractor will protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

C. Environmental Protection: Each contractor will provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.. Avoid using tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site.

1. Comply with work restrictions specified in Division 01 Section "Summary."

D. Stormwater Control: **The General Contractor** will comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

E. Tree and Plant Protection: **The General Contractor** will install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

F. Enclosure Fence: **The General Contractor** when excavation begins will install an enclosure fence with lockable entrance gates. Install in a manner that will prevent the public and animals from easily entering the site, except by the entrance gates.

1. Provide open-mesh, 8’ high chain link fence with driven posts.
2. Extent of Fence: As required to enclose entire excavation.
3. Provide min. 2 double swing access gates and man gates. Each gate is to have a chain and padlock.
4. Provide (2) keys for each lock to the Construction Manager.
5. Remove fence upon completion of all exterior activities or sooner if directed by Construction Manager.
6. Creating a controlled access zone around demo area.
7. Providing overhead protection at all entry doors withing 30 feet of demo operations.
8. Provide mesh on fence at street sides and neighboring properties.

G. Barricades, Warning Signs, and Lights: The **General Contractor** will comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.

H. Temporary Signs: The **General Contractor** will prepare signs to provide directional information to construction personnel and visitors for each site. Unauthorized signs are not permitted.
   1. For construction traffic control/flow at entrances/exits, as designated by the Owner.
   2. For warning signs as required
   3. Per OSHA standards as necessary
   4. For trailer identification
   5. For "No Smoking" safe work site at multiple locations.
   6. Project Information sign as designed by the architect.

I. Temporary Egress: The **General Contractor** will maintain temporary egress from the site as indicated and as required by authorities having jurisdiction. Provide man door in site fence for ingress and egress.

J. Temporary Enclosures: **Each prime contractor** will provide temporary enclosure for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
   1. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 sq. ft. or less with plywood or similar materials.
   2. Where temporary wood or plywood enclosure exceeds 100 sq. ft. in area, use UL labeled, fire-retardant-treated material for framing and main sheathing.

K. Temporary Fire Protection: Each prime contractor until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10, "Standard for Portable Fire Extinguishers," and NFPA 241, "Standard for Safeguarding Construction, Alterations, and Demolition Operations."

   1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
   2. Store combustible materials in containers in fire-safe locations.
   3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for fighting fires. Prohibit smoking in hazardous fire-exposure areas.
   4. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.

L. Security Enclosure and Lockup: The **General Contractor** will install substantial temporary enclosure of partially completed areas of construction. Provide temporary doors and locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.

1. Storage: **Each prime contractor** is responsible for their materials and equipment to be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

3.5 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture-Protection Plan: **Each Contractor** is to avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
1. Protect porous materials from water damage.
2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Remove standing water from decks.
5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before Permanent Enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.
3. Periodically collect and remove waste containing cellulose or other organic matter.
4. Discard or replace water-damaged material.
5. Do not install material that is wet.
6. Discard, replace or clean stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities and good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
2. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Unless the Architect requests that it be maintained longer **each prime contractor** will remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the property of each prime contractor.
2. At Substantial Completion, **Each prime contractor** will be responsible to clean and renovate permanent facilities related to the work of their contact and used during the construction period including, but not limited to, the following:

    a. Replace air filters and clean inside of ductwork and housings.
    b. Replace significantly worn parts and parts subject to unusual operating conditions.
    c. Replace lamps burned out or noticeably dimmed by hours of use.

END OF SECTION 01500

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SECTION 015500 ACCESS ROADS, PARKING AND STAGING AREAS + SITE LOGISTICS PLAN

PART 1 - GENERAL

1.01 Requirements Included

A. Access Roads and parking.

PART 2 - PRODUCTS

2.01 Materials

Not used

PART 3 - EXECUTION

3.01 Installation

Not used

3.02 Access Roads

3.03 Existing Pavements and Parking Areas

A. Existing site driveways may be used for construction traffic.

B. Parking facilities are not available for construction personnel.

C. Storage of construction trailers or storage shed will be restricted to locations indicated on the Site Logistics Plan and as directed by the Construction Manager and may in no way interfere with the District's daily functions.

D. Temporary parking by construction personnel is allowed on site and is restricted to locations indicated on the Site Logistics Plan and as directed by the Construction Manager.

E. Traffic Regulations:
   a. Utilize only designated entrances.
   b. Maintain all traffic regulations.

3.04 Permanent Pavements and Parking Facilities

Not Used

3.05 Maintenance

A. Snow Removal as part of **Trades Work Contract #1**.

3.06 Removal and Repair

3.07 Staging

A. Temporary staging is allowed on site and is restricted to locations indicated on the Site Logistics Plan and as directed by the Construction Manager.

3.08 Project Signage- **Trades Work Contract #1** to provide a project sign as further clarified in Section 01 12 00.

END OF SECTION 01 55 00

SECTION 01 56 10 - NOISE CONTROL

PART 1 GENERAL

1.01 Requirements Included

A. Provide and maintain labor, methods, equipment, and temporary construction as necessary to provide controls over environmental conditions at the construction site and related areas under Contractor's control; remove physical evidence of temporary facilities at completion of Work.

B. Comply with the general noise and vibration restrictions as set forth by current OSHA, State and local government and as required by the Owner to avoid disruption of adjacent facility use.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION 01 56 10

SECTION 01 56 90 – CONSTRUCTION CLEANING

PART 1 GENERAL

1.01 Requirements Included

A. Cleaning and disposal of waste materials, debris and rubbish during construction.

1.02 Cleaning Notice

A. Each Contractor is responsible for clean-up and disposal of waste materials, debris and rubbish on a daily basis.

B. The Owner/Construction Manager may issue written notification of insufficient cleaning relative to the requirements of this Section. Upon issuance of the cleaning notice:

1. All waste and accumulation of trash containing the Contractor's debris shall be removed from the Owner's premises within 24 hours of notification.

2. All designated project areas containing the Contractor's debris or requiring general housekeeping shall be left fine broom clean (interior) or raked clean (exterior or rough surface). Sweeping compound shall be used for all interior broom cleaning to control dust.

C. Failure by the Contractor to comply with the 24 hour requirement of the notice to the satisfaction of the Owner/Construction Manager will result in a cleaning program directed by the Construction Manager at the expense of the Contractor. Cost of clean-up performed for the Owner will be deducted from the Contractor's Request for Payment.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

3.01 Cleaning

A. Maintain areas under Contractor's control free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from closed or remote spaces, prior to closing the space.

C. Daily clean interior areas to provide suitable conditions for work.

D. Broom clean interior areas prior to start of surface finishing, and continue cleaning on an as needed- basis.

E. Control cleaning operations so that dust and other particles will not adhere to wet or newly coated surfaces.

3.02 Disposal

A. Dumpsters shall be located on site, accessible to building and roads. Each Contractor (exceptions see Section 01 10 00) may legally load acceptable construction debris into the Dumpsters (from this project only). Cost of all disposal fees for these Dumpsters shall be by the Contractor and Dumpsters shall remain on the project until project completion, or as directed by Construction Manager.

B. Dumpsters and costs of all disposal fees for the work shall be the responsibility of the Contractor.

C. It is the responsibility of all Contactors to secure all Dumpsters provided by same during off-hours.

END OF SECTION 01 56 90

SECTION 01 60 00 - PRODUCT REQUIREMENTS

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 SUMMARY

A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

B. Related Sections include the following:
   1. Division 01 Section "References" for applicable industry standards for products specified.
   2. Division 01 Section "Closeout Procedures" for submitting warranties for Contract closeout.
   3. Divisions 02 through 49 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
   3. Comparable Product: Product that is demonstrated and approved through review process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.4 SUBMITTALS

A. Product List: Submit a list, in tabular from, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.

1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
2. Form: Tabulate information for each product under the following column headings:

    a. Specification Section number and title.
    b. Generic name used in the Contract Documents.
    c. Proprietary name, model number, and similar designations.
    d. Manufacturer's name and address.
    e. Supplier's name and address.
    f. Installer's name and address.
    g. Projected delivery date or time span of delivery period.
    h. Identification of items that require early submittal approval for scheduled delivery date.

3. Completed List: Within Thirty (30) days from Notice To Proceed, submit Five (5) copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
4. Architect's Action: Architect will respond in writing to Contractor Ten (10) days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.

B. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

    a. Statement indicating why specified material or product cannot be provided.

b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within Seven (7) days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within Fifteen (15) days of receipt of request, or Seven (7) days of receipt of additional information or documentation, whichever is later.

a. Form of Acceptance: Change Order.
b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

C. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
3. Refer to Divisions 02 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
3. Where products are accompanied by the term "as selected," Architect will make selection.
4. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
5. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

6. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in Part 2 "Comparable Products" Article.

B. Product Selection Procedures:

1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
3. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
4. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
5. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
6. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.
7. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

    a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.

8. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.

    a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
    b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern,

density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

A. Refer to Section 01 25 00 – Substitution Procedures.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 71 16 - ACCEPTANCE OF EXISTING CONDITIONS

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 00 and 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. General installation of products.
4. Progress cleaning.
5. Starting and adjusting.
6. Protection of installed construction.
7. Correction of the Work.

B. Related Sections include the following:

1. Division 01 Section 01 30 00 "Construction Procedures and Control" for procedures for coordinating field engineering with other construction activities.
2. Division 01 Section 01 32 19 "Submittals" for submitting surveys.
3. Division 01 Section 01 73 29 "Cutting and Patching" for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.
4. Division 01 Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 SUBMITTALS

A. Qualification Data: For land surveyor.

B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

C. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

D. Certified Surveys: Submit three (3) copies signed by land surveyor.

1.4 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

a. Description of the Work.
b. List of detrimental conditions, including substrates.
c. List of unacceptable installation tolerances.
d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a Request for Information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on the form provided in Section 01 25 10 “RFI Form”.

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect and Construction Manager promptly and in writing.

B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Architect and Construction Manager when deviations from required lines and levels exceed allowable tolerances.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Construction Manager.

3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect and Construction Manager before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

B. Benchmarks: Establish and maintain a minimum of two (2) permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

D. Final Property Survey: Prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.

1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.

2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produces harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

3.7 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 01 Section "Quality Requirements."

3.8 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.9 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 01 Section "Cutting and Patching."

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 71 16

SECTION 01 72 00 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
   1. Construction layout.
   2. Field engineering and surveying.
   3. General installation of products.
   4. Progress cleaning.
   5. Starting and adjusting.
   6. Protection of installed construction.
   7. Correction of the Work.

B. See Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.2 SUBMITTALS

A. Certificates: Submit certificate signed by professional engineer certifying that location and elevation of improvements comply with requirements.

PART 2 - PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
   1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
   1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
   2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for

installation tolerances and other conditions affecting performance. Record observations.

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
B. General: Engage a professional engineer to lay out the Work using accepted surveying practices.
    1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
    2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
    3. Inform installers of lines and levels to which they must comply.
    4. Check the location, level and plumb, of every major element as the Work progresses.
    5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
    6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather

conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points.
   1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Make vertical work plumb and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
   1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
   2. Allow for building movement, including thermal expansion and contraction.
   3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not

considered hazardous.

3.6 PROGRESS CLEANING

A. Refer to Section 01 56 90 - Construction Cleaning.
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3.7 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 01 Section "Quality Requirements."

3.8 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.9 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 01 Section "Cutting and Patching."
    1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
B. Restore permanent facilities used during construction to their specified condition.
C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 72 00

SECTION 01 73 29 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. Contractor is responsible for all cutting, fitting and patching required for alteration Work, including but not limited to:

1. Coordination between all trades.
2. Performing sequential excavation and backfill.
3. Completing the Work or making its several parts fit together properly or integrate with other Work.
4. Uncovering portions of the Work to provide for installation of ill-timed Work.
5. Removing and replacing defective Work.
6. Removing and replacing Work not conforming to requirements of Contract Documents.
7. Removing samples of installed Work as specified for testing.
8. Providing routine penetrations of nonstructural surfaces for installation of materials such as piping and electrical conduit.

1.2 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.3 SUBMITTALS

A. Cutting and Patching Plan: Submit a plan describing procedures at least 15 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:

1. Extent: Describe reason for and extent of each occurrence of cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
3. Products: List products to be used for patching and firms or entities that will perform patching work.

a. Include workmen qualifications for cutting and patching of weather-exposed or moisture-resistant elements, and sight exposed finished surfaces of existing construction being altered.
b. Include workmen qualifications for cutting and patching of weather-exposed or moisture-resistant elements, and sight exposed finished surfaces of existing construction being altered.

4. Dates: Indicate when cutting and patching will be performed.
5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.

    a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Enclosure Elements: Indicate measures regarding the integrity or effectiveness of weather-exposed or moisture-resistant elements and systems.
8. Alternatives to Cutting and Patching: Include a description of alternatives to cutting and patching.
9. Notices: Notify Owner and separate contractor when cutting and patching affects newly installed construction not performed under this Project; include evidence of notification and written permission.
10. Construction Manager's Approval: Obtain approval of cutting and patching plan before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.4 QUALITY ASSURANCE

A. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.

    1. A structural element includes any load-bearing, lateral force-resistant member, and wind or seismic movement resisting construction.
    2. Take precautions and exercise care to ensure Work is removed neatly and without movement or settlement to remainder of building. Contractor will be held liable for any damage, movement, settlement caused thereby or resulting therefrom.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Examples of operating elements include, but are not limited to, the following:

1. Primary operational systems and equipment.
2. Air or smoke barriers.
3. Fire-suppression systems.
4. Mechanical systems piping and ducts.
5. Control systems.
6. Communication systems.
7. Conveying systems.
8. Electrical wiring systems.
9. Operating systems of special construction in Division 13 Sections

C. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Examples of miscellaneous elements include, but are not limited to, the following:

1. Water, moisture, or vapor barriers.
2. Membranes and flashings.
3. Exterior curtain-wall construction.
4. Equipment supports.
5. Piping, ductwork, vessels, and equipment.
6. Noise- and vibration-control elements and systems.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

E. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

F. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

G. Qualifications: Workmen to have minimum three (3) years experience in working with materials being cut and patched.

1.5 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials identical to in-place materials.

1. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
2. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

C. Materials used for sealing openings shall have a fire rating equal to or greater than the rating of the floor, ceiling or partition and shall comply with applicable codes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
2. Restore Work and surfaces with new products in accordance with requirements of the Contract Documents.

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. Employ original Installer for cutting and patching of newly installed construction; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Where specifically indicated on the Drawings, patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
    a. Refinish entire surfaces as necessary to provide an even new finish.
    b. For continuous surfaces, refinish to nearest intersection.
    c. For assemblies, entirely refinish.
    d. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    e. Restore damaged pipe covering to its original condition.
3. Floors and Walls: Where walls or partitions that are removed extend on finished area into another, patch and repair floor and wall surfaces in the new space.

Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials.

a. Patch subfloors under removed partitions, fixed equipment, etc. by cutting back, applying underlayment, concrete fill or other acceptable leveling fill as necessary to provide subfloor that is level with adjacent existing subfloors and properly prepared to receive finish flooring.
b. In renovated rooms/areas to receive new floor finishes, remove existing finish flooring and related materials and prepare subfloor by cutting back, applying concrete fill or other acceptable leveling fill as necessary to provide subfloor that is level and properly prepared to receive new floor finish as required by Room Finish Schedule and material manufacturers written recommendations.
c. In renovated rooms/areas to receive new wall finishes, those portions of existing walls that remain shall have their surfaces patched, cut back, or brought forward as necessary, and prepared as required to receive the new finishes per Room Finish Schedule.
d. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for the substrate over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
e. In rooms or areas where patching is required on one wall only, that entire wall is to be refinished to match the existing finish and color, including existing painted doors, door frames and window frames if they occur in that wall.
f. In rooms or areas where patching is required on two or more walls, all walls including painted doors, door frames and painted window frames, are to be refinished.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
   a. In rooms or areas where patching is required in an existing plaster or gypsum wallboard ceiling, the entire ceiling is to be repainted. In rooms where patching is required in existing acoustic tile ceilings, patch ceilings with matching type and pattern of acoustic tile, clean all remaining tile and apply one coat of white latex paint by roller over all tile surfaces. Clean all exposed metal suspension system.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
6. Openings created as a result of removal of materials must be patched to match adjacent construction as to materials and finishes, unless otherwise indicated.

   a. Contractor responsible for cutting and patching shall also be responsible for furnishing and installing lintels where openings are cut through existing masonry or concrete walls. Refer to Lintel Schedule in Division 05 Section ”Metal Fabrications” for sizing of lintels, unless lintels are shown on Drawings.
7. Where existing equipment is removed and new equipment is installed in the existing opening, the Contractor installing the new equipment shall close up the unused portion of the opening with materials matching adjacent construction.

8. When new rubber or vinyl stair treads, risers, and landings are installed at existing stairs, paint all exposed steel.
9. Paint all exposed insulated or non-insulated pipes and ducts in finished rooms or areas.
10. Where existing equipment or assemblies are removed, the Contractor removing the equipment shall patch and repair the floor, walls and ceiling.

D. Roofing:

1. Before commencing with cutting and patching of roofing, consult with the Owner regarding the existence of an outstanding roofing warranty. If such a warranty exists, obtain written approval of the methods to be used from the roofing manufacturer who issued the warranty so as not to affect the value of the warranty.
2. If necessary, cutting and patching of roofing to be performed by roofing manufacturer authorized personnel only.
3. Cut, patch, repair and extend roofing and insulation as follows:

    a. Where disturbed or damaged by alteration Work or activities related to same.
    b. Where new Work connects to existing construction.

4. Roof areas penetrated for alterations shall be protected against damage and leakage by the Contractor performing the Work. Roof openings shall not be left uncovered or unprotected overnight or during any periods of rainy or inclement weather.
5. Remove loose aggregate, if applicable, and store away from work area.
6. Work shall be performed in a manner to provide for permanent water-tight splice or repair.
7. Roof repair and alteration Work and materials shall match existing roofing materials and construction.
8. Upon completion and inspection of splice or repair Work, remove debris from the roof and replace the aggregate as required.
9. Protect undisturbed existing and newly repaired roofing subject to traffic and damage.

3.4 CLEANING

A. Clean areas and spaces where cutting and patching are performed.

B. Completely remove excess paint, mortar, oils, putty, and similar materials from finished surfaces.

END OF SECTION 01 73 29

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous demolition and construction waste.
2. Disposing of nonhazardous demolition and construction waste.

1.2 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility as identified in section 02 41 00 selective demolition.

E. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work as identified in section 02 41 00 selective demolition.

1.3 ACTION SUBMITTALS

1.4 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until installation.
4. Protect items from damage during transport and storage.
5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for Sale and Donation: Not permitted on Project site.

C. Salvaged Items for Owner's Use:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

D. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.

E. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.

F. Plumbing Fixtures: Separate by type and size.

G. Lighting Fixtures: Separate lamps by type and protect from breakage.

H. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

3.2 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION 01 74 19

SECTION 017423 - PROGRESS AND FINAL CLEANING

1.0 PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section includes the requirements for clean-up requirements.

1.3 DESCRIPTION

A. Maintain premises and public properties free from accumulations of waste, debris, and rubbish caused by operations.

B. All portions of the facility affected by the construction activity shall be cleaned at the close of each workday. Minimum cleaning is to be broom swept, put into trash bin and emptied.

C. Upon Substantial Completion of Work, remove balance of waste materials, rubbish, tools, equipment, machinery, and surplus materials, and clean all exposed surfaces; leave project clean and ready for occupancy.

1.4 SAFETY REQUIREMENTS

A. Standards: Maintain project in accord with safety and insurance standards.

B. Hazards Control
   1. Store volatile wastes in covered metal containers and remove from premises daily.
   2. Prevent accumulation of wastes that create hazardous conditions.
   3. Provide adequate ventilation during use of volatile or noxious substances.

C. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
   1. Do not burn or bury rubbish and waste materials on project site.
   2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
   3. Do not dispose of wastes into streams or waterways.

2.0 PART 2 - PRODUCTS

2.1 MATERIALS

A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

3.0 PART 3 - EXECUTION

3.1 CLEANING DURING CONSTRUCTION

A. Execute cleaning to ensure that building, grounds and public properties are maintained free from accumulations of waste materials and rubbish.

B. Wet down dry materials and rubbish to lay dust and prevent blowing dust. Erect dustproof barriers to keep dust from drifting through the building.

C. Each day Contractor shall affect the following:
   1. Areas of intense activity, such as cutting and sawing must be swept clean and reorganized at the end of each day.
   2. Areas of moderate activity such as installation of plumbing, ductwork, electrical work must be returned to good order at the end of each day.
   3. Debris below scaffolds (and shoring/re-shoring) must at all times, be kept sufficiently consolidated to keep walkways free of tripping hazards. These work areas must also be swept clean immediately upon removal of scaffolds.
   4. All swept up debris, waste materials, and packing must be removed and/or placed in the dumpster by noon of the following workday.
   5. All stored material must be kept in good order.
   6. As portions of the work are completed, all used and excess materials must be removed promptly.
   7. Daily clean-up and good housekeeping is the responsibility of each Contractor individually and will be monitored by the Construction Manager.
   8. Contractor shall promptly comply with requests to organize scattered materials.
   9. Large amounts of debris must be removed by using enclosed chutes or a similar sealed system. There shall be no movement of debris through occupied spaces of the building. No material shall be dropped or thrown outside the walls of the building.

D. Separate and recycle as required by local authorities and regulations.

E. Handle materials in a controlled manner with as few handling as possible; do not drop or throw materials from heights. Contractor shall provide and maintain a trash chute at the existing buildings for use by all trades.

F. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.

G. Excess concrete, block, terrazzo mix, mortar or grout is the responsibility of the Contractor to remove from the site.

H. Contractor working on site shall provide one worker to perform clean up at the site as directed by Construction Manager.

3.2 FINAL CLEANING

A. General: The general conditions require general cleaning during construction. Regular site cleaning is included in Division 01 Section “Temporary Facilities”.

B. Cleaning: Employ experienced professional cleaning service for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions

C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

D. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion for entire Project or for a portion of Project:

1. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
3. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
4. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
5. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
6. Sweep concrete floors broom clean in unoccupied spaces.
7. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
8. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
9. Remove labels that are not permanent.
10. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
    a) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
11. Wipe surfaces of mechanical and electrical equipment, [elevator equipment,] and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
12. Replace parts subject to unusual operating conditions.
13. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
14. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
15. Clean ducts, blowers, and coils if units were operated without filters during construction.

16. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
17. Leave Project clean and ready for occupancy.

E. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction. Paragraphs below represent end of the work specified in Division 01 section "Temporary Facilities." Most projects require these actions at completion of construction.

F. Pest Control: No type of Pest Control measures will be allowed to be performed by the Contractor. The School district is to engage an experienced, licensed exterminator for inspection and rid project of rodents, insect and other pests.

G. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

1. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

END OF SECTION 017423

SECTION 01 77 00 - CLOSEOUT PROCEDURES

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 administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.

B. Related Sections include the following:
1. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
3. Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Work duration construction photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.

8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect and Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to the General Conditions of the Contract for Construction.
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect and Construction Manager. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect and Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three (3) copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

a. Project name and SED control number
b. Date.
c. Name of Architect and Construction Manager.
d. Name of Contractor.
e. Page number.

PART 2 - PRODUCTS

2.1 MATERIALS

Not Used.

PART 3 - EXECUTION

3.1 FINAL CLEANING

Not Used.

END OF SECTION 01 77 00

SECTION 01 78 23 - OPERATIONS AND MAINTENANCE MANUALS AND DATA

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 00 and 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Maintenance manuals for the care and maintenance of products, materials, and finishes, systems and equipment.

B. Related Sections include the following:

1. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
2. Division 01 Section "Closeout Procedures" for submitting operation and maintenance manuals.
3. Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 SUBMITTALS

A. Initial Submittal: Submit two (2) draft copies of each manual at least fifty (50) days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Architect will return one (1) copy of draft and mark whether general scope and content of manual are acceptable.

B. Final Submittal: Submit one (1) copy of each manual in final form at least five (5) days before final inspection. Architect will return copy with comments within seven (7) days after final inspection.

1. Correct or modify each manual to comply with Architect's comments. Submit two (2) copies of each corrected manual within fifteen (15) days of receipt of Architect's comments.

2. Include (3) copies electronically and submit on flash drives for distribution. O&M flash drives shall include as builts as well.

1.5 COORDINATION

A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Organization: Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 MANUALS, GENERAL

A. Multiple Project Sites: When the Project involves multiple project sites prepare separate manuals for each separate site address, including in each manual only those items that apply to each individual site.

B. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

C. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name, address, and telephone number of Contractor.
6. Name and address of Architect.
7. Cross-reference to related systems in other operation and maintenance manuals.

D. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

E. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.

b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

   a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
   b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

4. Fire.
5. Flood.
6. Gas leak.
7. Water leak.
8. Power failure.
9. Water outage.
10. System, subsystem, or equipment failure.
11. Chemical release or spill.

B. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

C. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions.
2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUAL

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in the manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard printed maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.

1. Do not use original Project Record Documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared Record Drawings in Division 01 Section "Project Record Documents."

G. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 23

SECTION 01 78 39 - PROJECT RECORD DOCUMENTATION

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 administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

B. Related Sections include the following:

1. Division 01 Section "Closeout Procedures" for general closeout procedures.
2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
3. Divisions 02 through 49 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.3 SUBMITTALS

A. Record Drawings: Submit one (1) hard copy set of marked-up Record Prints showing construction modifications. Include scanned PDFs on the three (3) O&M flash drive submissions as well.

B. Record Specifications: Submit one (1) hard copy of marked-up Project's Specifications, including addenda and contract modifications. Include PDFs on the three (3) O&M flash drive submissions as well.

C. Record Product Data: Submit one (1) copy of each Product Data submittal.

1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in the O&M manual as Record Product Data.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one (1) set of black-line white prints of the Contract Drawings and Shop Drawings.

1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an understandable drawing technique.
c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.
b. Revisions to details shown on Drawings.
c. Depths of foundations.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Change Directive.
k. Changes made following Architect's written orders.
l. Details not on the original Contract Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, Alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Identification: As follows:

    a. Project name.
    b. Date.
    c. Designation "PROJECT RECORD DRAWINGS."
    d. Name of Architect.
    e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's and Construction Manager's reference during normal working hours. Record Documents will be checked monthly, incomplete documents will be reason to withhold payments.

END OF SECTION 01 78 39

SECTION 017900 - DEMONSTRATION AND TRAINING REQUIREMENTS

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 00 and 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.

B. Related Sections include the following:

1. Division 01 Section "Allowances" for administrative and procedural requirements for demonstration and training allowances.
2. Division 01 Section "Construction Procedure and Control" for requirements for pre-instruction conferences.
3. Divisions 02 through 28 Sections for specific requirements for demonstration and training for products in those Sections.

C. Allowances: Furnish demonstration and training instruction time under the Demonstration and Training Allowance (if there is one) as specified in Division 01 Section "Allowances."

D. Unit Price for Instruction Time: Length of instruction time will be measured by actual time spent performing demonstration and training in required location. No payment will be made for time spent assembling educational materials, setting up, or cleaning up or if a unit price isn’t specified for training.

1.3 SUBMITTALS

A. Instruction Program: Submit two (2) copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module.

B. Attendance Record: For each training module, submit list of participants and length of instruction time.

1.4 QUALITY ASSURANCE

A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 01 Section "Quality Requirements," experienced in operation and maintenance procedures and training.

1.5 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction.

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner with at least fourteen (14) days' advance notice.

C. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION 01 79 00

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SECTION 020800 – ASBESTOS REMOVAL

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Work of this Section shall be performed in accordance with the requirements of the Contract Documents, including but not limited to Instructions to Bidders, Agreement and General Conditions and General Requirements.

B. This Section references procedures for the removal of known and/or assumed asbestos-containing materials (ACM) that will be disturbed or are disturbed during construction of this project.

C. Furnish all labor, materials, supervision, construction tools and equipment necessary to remove and dispose of all asbestos-containing materials disturbed during construction.

Three (3) environmental reports, each titled “Limited Pre-Renovation Regulated Building Materials Inspection” dated December 2023, prepared by LaBella Associates can be found in the “hazardous materials summary" specification (division 00). These reports incorporate and include all testing data obtained for the sites, based on project scope and materials reported to be disturbed by planned renovations. See specification section 003126 for detailed descriptions of the types and locations of hazardous materials identified.

The following asbestos-containing materials are identified at the sites per the AHERA reports dated November 2006 or are assumed positive:

Meadow Hill School
1. Block Paint
2. Mudded Pipe Fittings
3. 9” Floor Tiles
4. Floor Tile Mastic
5. Sink Undercoating
6. Exterior Waterproofing Membrane (Assumed)
7. Roofing System (Assumed)

Temple Hill School
1. Block Paint
2. Mudded Pipe Fittings
3. 9” Floor Tiles
4. Floor Tile Mastic
5. Sink Undercoating
6. Exterior Waterproofing Membrane (Assumed)
7. Roofing System (Assumed)

Gidney School

1. Mudded Pipe Fittings
2. Roofing System (Assumed)

D. The Contractor shall be aware of all conditions of the Project and is responsible for verifying quantities and locations of all Work to be performed referenced in the Contract Documents. Failure to do so shall not relieve the Contractor of its obligation to furnish all labor and materials necessary to perform the Work.

E. Removal or disturbance of ACM shall be completed in compliance with all governing regulations, including Code Rule 56. Any Contractor, other than the asbestos abatement contractor, who requires the removal or disturbance of asbestos-containing material (ACM) to complete his work shall obtain the services of a certified asbestos abatement contractor to remove the ACM in compliance with this specification and all applicable rules and regulations.

F. The Owner's Representative shall approve the asbestos abatement contractor prior to the beginning of the work.

G. Working hours shall be as required and approved by the Owner. The Contractor shall coordinate and schedule all Work with the facility and Owner's representative.

H. Locations and quantities of all materials to be removed by the abatement contractor must be field verified. Information given on drawings and in the specifications is for general orientation and information only.

I. The contractor shall have at least one supervisor on the job site at all times who can read and write and is fluent in English, while the project is in progress. The supervisor must be able to communicate fluently with all employees.

J. Contractor shall provide temporary protection to keep the work areas enclosed, where required, during the performance of the Contract Work. The Contractor shall be responsible for any damage caused as a result of improper temporary protection.

K. The Contractor is responsible for keeping the work area in a clean and safe condition at all times.

L. Contractor is to coordinate with other trades on the job concerning scheduling, phasing, etc.

1.2 SPECIAL CONDITIONS

A. Any special job conditions, including variances obtained by the Owner, are described below.

• No Variance Petitions have been submitted to date.

B. Abatement may occur in portions of the building where immediately adjacent floors or areas are occupied. The Contractor shall carefully observe regulatory requirements for

the isolation of abatement work areas and appropriate notifications to occupants and signage at project area boundaries.

C. Removal of flooring adhesives SHALL NOT BE DONE with using chemical methods

- Removal of adhesive NOT containing asbestos or other NON-HAZARDOUS materials shall be done in accordance with Division 02 Section Selective Structure Demolition Specifications.

1.3 CODES AND REGULATIONS

A. General Applicability of Codes and Regulations and Standards: Except to the extent that more explicit or more stringent requirements are written directly into the Contract Documents, all applicable codes, regulations and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies are bound herewith.

B. Contractor Responsibility: The Contractor shall assume full responsibility and liability for the compliance with all applicable Federal, State and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State and local regulations. The contractor shall hold the Owner and Owner's Representative harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of himself, his employees or his subcontractors.

C. Federal Requirements which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

OSHA: U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), including but not limited to:

- Respiratory Protection
  Title 29, Part 1910, Section 134 of the Code of Federal Regulations
- Access to Employee Exposure and Medical Records
  Title 29, Part 1910, Section 1020 of the Code of Federal Regulations
- Hazard Communication
  Title 29, Part 1910, Section 1200 of the Code of Federal Regulations
- Specification for Accident Prevention Signs and Tags
  Title 29, Part 1910, Section 145 of the Code of Federal Regulations
- Variances from safety and health standards
  Title 29, Part 1926, Section 2 of the Code of Federal Regulations

- General Safety and Health Provisions
  Title 29, Part 1926, Section 20 of the Code of Federal Regulations

- Asbestos General Standard
  Title 29, Part 1926, Section 1001 of the Code of Federal Regulations

- Asbestos Contstruction Standard - Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite
  Title 29, Part 1926, Section 1101 of the Code of Federal Regulations

DOT: U.S. Department of Transportation, including but not limited to:

- Hazardous Substances
  Title 29, Part 171 and 172 of the Code of Federal Regulations

EPA: U.S. Environmental Protection Agency (EPA), including but not limited to:

- The Asbestos Hazard Emergency Response Act (AHERA), EPA Title 40 CFR, Part 763

- National Emission Standard for Hazardous Air Pollutants (NESHAPS), EPA Title 40 CFR, Part 61

- Title 40, Part 61, Subpart A, and revised Subpart M (Revised Subpart B) of the Code of Federal Regulations dated November 20, 1990

D. State Requirements which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

- New York State Department of Labor (NYSDOL) 12 NYCCR Part 56, as amended March 21, 2007. Also known as Industrial Code Rule 56 (ICR 56).

- New York State Department of Environmental Conservation (DEC) Regulations regarding waste collector registration Title 6, Part 364 of the New York State Official compilation of Codes, Rules and Regulations. An annual “Industrial Waste Hauler Permit” specifically for asbestos-containing materials is required for transportation of asbestos-containing waste to the disposal site.

- New York State Department of Health (NYS DOH), Title 10, Part 73 (Asbestos Safety Program Requirements, Environmental Laboratory Approval Program)

E. Local Requirements: Abide by all local requirements which govern asbestos abatement work or hauling and disposal of asbestos waste materials.

1.4 SUBMITTALS

A. Prior to commencement of any work (minimum of seven days prior to starting work) involving the disturbance of ACM, the Contractor shall submit the following to the Owner's Representative for review and approval:

1. Copy of current NYSDOL Contractor's License (DOH-432)
2. Copies of current worker's Asbestos Handler's Certificates
3. Provide a statement signed by an authorized representative of the company stating that the Building Occupants/Other Trades notification required by ICR 56 will be or has been posted at least 10 days prior to the start of abatement. Provide a copy of the notification that will be posted at the job site
4. Copies of all proposed site-specific variances
5. Copy of current insurance certificate held by the Asbestos Contractor that names the Newburgh Enlarged Central School District as an additional insured and provides the following coverages: 1) Pollution liability in a general aggregate of $2,000,000; and 2) General Liability with $1,000,000/$2,000,000 for each occurrence/general aggregate; and 3) Workers Compensation
6. Copies of Project Notifications and proof of submittal (e.g. certified mail receipt) to NYSDOL and USEPA
7. Copy of NYSDEC permit for waste hauler
8. Name and address of landfill where asbestos-containing waste materials are to be buried. Include contact person and telephone number and NYSDEC Part 360 permit number or other applicable permits
9. Site-specific work plan in accordance with Section 1.5 D
10. On a weekly basis, submit copies of all waste shipment records and disposal site receipts to the Owner

B. During the project, legible copies of the following items must be submitted to the Owner's Representative (LaBella Associates, D.P.C.). If personnel records are not available at this time, workers will not be able to work on-site until copies are provided:

1. NYSDOL Asbestos Handling Certificates (DOH 442) for all persons employed on the project
2. Project Logbook entries
3. Any and all changes to the Contract, should any occur
4. Personal sampling results within 24 hours of sampling

C. Upon completion of the project, legible copies of the following items must be submitted to the Owner's Representative (LaBella Associates, D.P.C.):

1. Waste manifests, shipment records, and landfill receipts signed by the landfill operator submitted within 30 days after the waste leaves the site. A percentage of the final payment will be withheld until the Owner or Owner's Representative receives the waste shipment record.

1.5 QUALITY ASSURANCE

A. Comply with the most recent edition of compilation of Codes, Rules and Regulations of the State of New York (Statutory Authority: Labor Law Section 906), including Rule 56 of

Title 12 NYCRR, New York State, Department of labor, most currently amended (hereinafter referred to in this Specification as Code Rule 56). Note: Article 30 of the Labor Law sets forth procedures and standards that must be met by parties who desire to obtain variations of any of the requirements of this rule.

B. Comply with all current and appropriate Federal, State and Local rules and regulations regarding work of this section, including those of the following agencies:

- New York State Uniform Fire Prevention and Building Code
- New York State Department of Labor
- New York State Department of Environmental Conservation (DEC)
- Occupational Safety and Health Administration (OSHA)
- United States Environmental Protection Agency (EPA)

C. Pre-Work Conference: Before the work of this section is scheduled to commence, a conference may be held at the site for the purpose of reviewing the Contract Documents, discussing requirements for the work and reviewing the work procedures. The conference shall be attended by the asbestos abatement contractor.

D. Work Plan: The Contractor shall prepare a detailed work plan and submit the plan no later than one week prior to the start of the abatement project. The work plan shall include, but not be limited to:

1. A preliminary schedule for completion of the work:
   a. Show the complete sequence of abatement activities and the sequencing of Work within each building or building section.
   b. Show the dates for the beginning and completion of each major element of Work including substantial completion dates for each Work Area, building, or phase.
2. Work procedures that will be utilized (including anticipated decon and negative air exhaust locations).
3. Estimated crew size.
4. The anticipated work hours.
5. Emergency procedures for fire and medical emergencies and for failure of containment barriers.
6. Project Notifications: As required by Federal and State regulatory agencies together with proof of transmittal (i.e. certified mail return receipt).
7. Building Occupant Notification: As required by regulatory agencies.
8. Abatement Work Plan: Provide plans that clearly indicate the following:
   a. All Work Areas/containments numbered sequentially.
   b. Locations and types of all decontamination enclosures.
   c. Entrances and exits to each Work Areas/containments.
   d. Type of abatement activity/technique for each Work Area/containment.
   e. Number and location of negative air units and exhaust. Also provide calculations for determining number of negative air pressure units.
   f. Proposed location and construction of storage facilities and field office.
   g. Location of water and electrical connections to building services.
   h. Waste transport routes through the building to the waste storage container.
9. Disposal Site/Landfill Permit from applicable regulatory agency.

10. NYS Department of Environmental Conservation Waste Transporter Permit.

E. Progress Meetings: The Owner's Representative will hold general progress meetings as required. A representative of the Contractor and the Owner is to be properly represented at each meeting.

F. Daily Log: The Contractor is to maintain within the Decontamination Unit a daily log documenting the dates and time of, but not limited to, the following items:

1. Meetings; purpose, attendees, brief discussion
2. Visitations; authorized and unauthorized
3. Special or unusual events, i.e., barrier breeching, equipment failures, accidents
4. Air monitoring tests and test results
5. Other entries as detailed in Code Rule 56-7.3 Asbestos Contractor Daily Project Log.

Submit three (3) copies of this log at final closeout of the Project as a Project closeout submittal.

G. Project Monitor: The Project Monitor shall be a representative of the Owner during the asbestos abatement portion of the project. The Project Monitor has the following responsibilities:

1. The Project Monitor shall oversee work practices and inspect for compliance with all applicable regulations and standards, and the Contract Documents.
2. The Project Monitor shall have at all times access to the work areas whenever it is in preparation or in progress. The Contractor shall provide the Project Monitor with keys to all locks located on the entrance(s) to the decontamination unit(s) and all other secured areas.
3. The Project Monitor, in conjunction with the Owner, will be the interpreter of the requirements of the Contract Documents and the judge of the performance thereunder.
4. The Project Monitor and/or the Owner will have the authority to reject work which is not in compliance with the requirements of the Contract Documents or Federal, State, or Local Regulations. The decision of the Owner will be final.

H. Air Sampling and Analysis

1. Area Air Sampling and Analysis
   a. The Owner will be responsible for hiring an independent third-party firm to perform the required area air sampling and analysis in accordance with ICR 56.
   b. The Contractor is required to ensure cooperation of its personnel with the Air Sampling Technician (AST) for general air sampling and testing of each work area after completion of asbestos work prior to removal of containment barriers.

c. All air samples shall be analyzed using Phase Contrast Microscopy (PCM) in accordance with NIOSH method 7400.

2. Personal Air Sampling
   a. As per the requirements of OSHA 1926.1101, the Contractor shall be required to perform personal air monitoring in order to determine that appropriate respiratory protection is being utilized.
   b. The analysis of personal air samples shall be conducted by an ELAP approved laboratory, subject to approval of the Owner or the Owner's Representative.
   c. Results of personnel air sample analyses shall be available, verbally, within twenty-four (24) hours of sampling and shall be posted at the work site within 48 hours. Results shall be submitted in accordance with the requirements of Section 1.5 F.

3. Final Clearance Air Sampling
   a. For Code Rule 56 PCM Analysis: The clearance air monitoring results shall be considered satisfactory when every sample demonstrates an airborne concentration of asbestos fibers of less than 0.01 fibers per cubic centimeter, or the background level, whichever is greater.
   b. For AHERA TEM Analysis: Clearance shall be satisfactory per AHERA protocols, summarized as; the mean average of all the inside samples shall have asbestos structure concentrations at or below 70 structures per millimeter squared and the average airborne asbestos concentration inside the work area is not higher that the average outside the work area.
   c. The Contractor shall pay for all additional costs incurred by the Owner, including additional air monitoring, project monitoring, engineering fees, and sample analysis required if clearance air monitoring fails, or if completion of abatement work is not in accordance with approved progress schedule.

1.6 GENERAL PROCEDURES

A. General Requirements Comply with Code Rule 56's procedures for entry, exit, logging in, showering, personal protective equipment, tools, clothing, etc., throughout the asbestos abatement. Respiratory equipment shall be as required by OSHA and air monitoring results. (Except for authorized visitors as required by Rule 56). Noncertified workers will not be allowed in the work area.

B. Equipment and Waste Container Decontamination and Removal – Code Rule 56's procedures for large projects (cleaning, recontainerization, holding areas, etc.) shall be followed.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. General Requirements: Code Rule 56's requirements for materials and equipment shall apply.

B. Miscellaneous protective materials - Provide plywood sheathing, hardboard, etc., as required to provide protective cover over surfaces of existing construction and finishes to eliminate damage resulting from work of this section, including impact and water damage. Poly shall comply with Code Rule-56 including fire retardant requirements.

C. Water and electricity shall be furnished by Owner without charge. Contractor shall provide an in-line backflow preventer at water source and utilize non-leaking hoses.

D. The Contractor shall supply the Project Monitor and Air Monitor with sufficient electricity to operate all high-volume air monitoring pumps as may be required during the project.

PART 3 - EXECUTION

3.1 REMOVAL REQUIREMENTS

A. Perform work under this contract in accordance with the standards referenced in Part 1 of this Section. The provisions of any site-specific variances to Code Rule 56, or other asbestos standards, obtained for this project may not be implemented until approval is given by the Owner or Owner's Representative.

B. Work that results in the disturbance of asbestos-containing materials shall be performed by a licensed asbestos abatement contractor who employs certified workers in accordance with all applicable standards referenced herein. If additional suspect ACM is discovered during the course of abatement, the Contractor shall notify the Owner or Owner's Representative immediately.

C. The Contractor shall protect all items/existing construction intended to remain.

D. Should the area beyond the asbestos work area(s) become contaminated with asbestos-containing dust or debris as a consequence of the work, immediately institute emergency procedures established for asbestos removal. All costs incurred in decontaminating such non-work areas shall be borne by the Contractor at no additional cost to the Owner.

E. Removal of flooring adhesives SHALL NOT BE DONE by using chemical methods.

- Removal of adhesive NOT containing asbestos or other NON-HAZARDOUS materials shall be done in accordance with Division 02 Section Selective Demolition Specifications.
- The surface preparation for existing concrete sub-floor surfaces to be reviewed at a pre-demolition meeting and mutually agreed upon by, but not limited to: the Owners project representative, Architect, General Contractor, demolition sub-contractor and flooring sub-contractors(s)

- All concrete slab repairs and preparation for new flooring materials shall be done under the General Construction Prime contract by an experienced flooring sub-contractor but not by work of this section.

3.2 WORK AREA PREPARATION

A. General Requirements: Code Rule 56's requirements for general work area preparation shall apply, including vacating, signs, power, timing, HVAC isolation, isolation barriers, objects, exits, toilets, etc.

3.3 PERSONAL AND WASTE DECONTAMINATION ENCLOSURE SYSTEMS

A. Comply with Code Rule 56's requirements for enclosure, showers, room types and configuration, etc.

3.4 DECONTAMINATION ENCLOSURE SYSTEMS/WORK AREA BARRIERS

A. General Requirements: Comply with Code Rule 56 requirements for maintenance of work area barriers. (Setting, inspection, repairs, cleaning, etc.)

3.5 SELECTIVE DEMOLITION

A. General Requirements: Comply with Code Rule 56 requirements regarding handling and removal procedures.

B. Dry removal or disturbance: No dry removal or disturbance or asbestos materials shall be permitted.

C. Wetting requirements: The asbestos material shall be wetted as necessary with amended water to keep asbestos fibers from becoming airborne. If any friable material is encountered, all of its surfaces shall be saturated.

D. The use of open flame, torches, welding and other Hot Work is not permitted without review and approval by the Owner or Owner’s Representative. A Hot Work Permit system shall be required for authorized use.

E. Cleaning of surfaces: After completion of all stripping work, surfaces where asbestos material has been removed or handled shall be HEPA vacuumed.

3.6 CLEANING PROCEDURES

A. General requirements: Code Rule 56's requirements for containerization, dust cleanup, tools and enclosure cleanup, etc., shall apply. Cleanup shall be by HEPA vacuum.

B. Post abatement requirements: Code Rule 56's requirements shall apply (tool/equipment cleanup, general cleanup, waste removal, clearance air monitoring, etc.).

3.7 ASBESTOS WASTE TRANSPORTATION AND DISPOSAL

A. Contractor shall minimally transport and dispose of all of the Category I non-friable asbestos waste material according to correct applicable NYSDEC transportation requirements, Part 364, and solid waste requirements Part 360.

B. If any removed material is "friable", Contractor shall handle it as such and transport and dispose of as "friable" asbestos waste per regulations referenced in Part 1 of this Section.

C. All waste generated as a result of this work shall be removed from the site within 10 days of completion and clearance of abatement work.

D. Log disposal site transportation names, etc., per Code Rule 56.

E. All loading, transportation, and disposal shall also comply with NESHAPS 40 CFR 61 - 150 paragraphs C, D and E including all requirements for loading signs, shipment records, content certificate, record receipts, notifications, etc.

3.8 TEMPORARY PROTECTION OF FACILITIES

A. Contractor shall provide temporary enclosure as required to protect the existing facilities from adverse weather conditions and maintain the interior environment in its normal condition. The contractor shall maintain the building secure from intrusion at all times and exits shall be operational during construction whenever the building is occupied. Temporary door and window enclosures shall be secure, weather resistant and lockable, if operable.

3.9 RESTORATION

A. Remove temporary decontamination facilities and restore area designated for these facilities to its original condition or better.

B. After final clearance, the Contractor shall replace all filters of the associated portions of the existing building HVAC system that were affected by the abatement operations, remove locks and restore power. All temporary power supplies shall be disconnected, power lockouts removed and building power restored. All temporary plumbing shall be removed.

C. Finishes damaged by asbestos removal operation including, but not limited to, plaster/paint damage due to taping of polyethylene sheeting and floor tile lifted due to humid conditions, shall be restored prior to final payment.

1. Finishes unable to be restored shall be replaced under this Contract.
2. All foam and expandable foam products and materials used to seal Work Area openings shall be completely removed upon completion of abatement activities.

D. All penetrations (including, but not limited to, pipes, ducts, etc.) through fire rated construction shall be fire stopped using materials and systems tested in accordance with ASTM E814 on projects where re-insulation is part of the required work.

3.10 PROJECT COMPLETION REQUIREMENTS

A. Submission by the Contractor to the Owner Representative of the job logbook as described in Section 1.5 paragraph F.

B. Inspection of the work sites by the Contractor's Project Manager's representative and the Owner's Representative for substantial completion of the Scope of Work.

C. Submission by the Contractor to the Owner of the waste disposal manifest verifying that all waste generated at the project site has been disposed of at an EPA approved waste site. A 10% payment retainage shall be withheld by the Owner until receipt of all waste manifests.

END OF SECTION 020800

SECTION 020810 - PROTECTION OF WORKERS – LEAD-CONTAINING MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Work of this Section shall be performed in accordance with the requirements of the Contract Documents, including but not limited to Instructions to Bidders, Agreement and General Conditions and General Requirements.

1.2 SCOPE

A. Contractors are alerted to the fact that the paint coatings on surfaces in this project have the potential to contain lead. Lead is a toxic metal capable of causing damage to the nervous system, kidneys, bones, heart and reproductive system.

B. Any surface coated with paint is considered to contain some percentage of lead, based on the previous reports. Any alteration and/or repair that results in the disturbance of the paint coatings shall meet the requirements of OSHA CFR 29 1926.62 Construction Lead Standard.

1.3 SUBMITTALS

A. Contractors of each trade shall submit their written Lead Program prior to the start of work. The plan must identify potential sources of lead exposure and propose specific procedures to protect workers from those exposures.

1.4 DEFINITIONS

A. **Action Level** means employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air (30 ug/m^3) calculated as an 8-hour time weighted average (TWA).

B. **Exposure Assessment** means a Contractor's requirement to determine if any Contractor's employees may be exposed to lead at or above the action level.

C. **Lead** means metallic lead, all inorganic lead compounds and organic lead soaps. Excluded from this definition are all other organic lead compounds.

D. **Permissible Exposure Limit (PEL)** means employee exposure, without the use of respirators, to an airborne concentration of lead of 50 ug/m^3 averaged over an 8-hour period.

PART 2 - PRODUCTS

None Specified.

PART 3 - EXECUTION

3.1 PROTECTION OF WORKERS

A. All Contractors shall be responsible to conduct an exposure assessment and shall initially determine if any Contractor's employee may be exposed to lead at or above the action level where their work causes the disturbance of paint or paint coatings, or provide a negative exposure assessment for work tasks to be completed under this scope of work.

3.2 EXPOSURE ASSESSMENT

A. The Contractor shall collect personal samples representative of a full shift including at least one sample for each job classification in each work area either for each shift or for the shift with the highest exposure.

1. **Below the Action Level** - should the initial personal air monitoring results be less than 30 ug/m^3 the Contractor shall make a written record of such determination. Further exposure determination need not be repeated except as follows:
   a. Whenever there has been a change of equipment, process, control, personnel or a new task has been initiated that may result in additional employees being exposed to lead at or above the action level or may result in employees already exposed at or above the action level being exposed above the PEL, the employer shall conduct additional monitoring.

2. **At or Above the Action Level but At or Below the PEL** - the Contractor shall perform monitoring until at least two consecutive measurements taken at least 7 days apart, are below the action level at which time the Contractor may discontinue monitoring for that employee except as otherwise provided in paragraph 3.02.A.1.a.

3. **Above the PEL** - the Contractor shall perform monitoring until at least two consecutive measurements taken at least 7 days apart, are at or below the PEL but at or above the action level at which time the Contractor shall repeat monitoring for that Contractor's employee as specified in 3.02.A.2.

B. The Contractor may submit a negative exposure assessment in lieu of performing exposure monitoring.

3.3 METHODS OF COMPLIANCE

A. To the extent feasible, Contractors must reduce worker lead exposure to the Permissible Exposure Limit (PEL) of 50 ug/m^3 by a combination of engineering controls, work practice, and administrative controls.

B. Respiratory protection and other protective equipment must be provided and used to the extent that the engineering and work practice controls cannot reduce exposure to the PEL as specified within 29 CFR 1926.62.

3.4 HOUSEKEEPING (required whenever lead is disturbed)

A. All surfaces shall be maintained as free as practical of accumulations of lead.

B. Clean up of floors and other surfaces where lead accumulates shall wherever possible be cleaned by vacuuming or other methods that minimize the likelihood of lead becoming airborne.

C. Shoveling, dry or wet sweeping and brushing may be used only where vacuuming or other equally effective methods have been tried and found not to be effective.

D. Where vacuuming methods are selected, the vacuums shall be equipped with HEPA filters and used and emptied in a manner which minimizes the reentry of lead into the workplace.

E. Compressed air shall not be used to remove lead from any surface unless the compressed air is used in conjunction with a ventilation system designed to capture the airborne dust created by the compressed air.

3.5 HYGIENE FACILITIES AND PRACTICES (required above the PEL)

A. The Contractor shall assure that in areas where Contractor's employees are exposed to lead above the PEL without regard to the use of respirators, food or beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied.

B. Change Areas (required above the PEL and during exposure assessment)
   1. The Contractor shall provide clean change areas for employees whose airborne exposure to lead is above the PEL, and as interim protection for employees.
   2. The Contractor shall assure that change areas are equipped with separate storage facilities for protective work clothing and equipment and for street clothes which prevent cross-contamination.
   3. The Contractor shall assure that Contractor's employees do not leave the workplace wearing any protective clothing or equipment that is required to be worn during the work shift.

C. Showers (required above the PEL)

1. The Contractor shall provide shower facilities, where feasible, for use by Contractor's employees whose airborne exposure to lead is above the PEL.
2. The Contractor shall assure where shower facilities are available, that Contractor's employees shower at the end of the work shift and shall provide an adequate supply of cleansing agents and towels for use by affected Contractor's employees.

D. Eating Facilities (required above the PEL)
1. The Contractor shall provide lunchroom facilities or eating areas for Contractor's employees whose airborne exposure to lead is above the PEL, without regard to the use of respirators.
2. The Contractor shall assure that lunchroom facilities or eating areas are as free as practicable from lead contamination and are readily accessible to Contractor's employees.
3. The Contractor shall assure that Contractor's employees whose airborne exposure to lead is above the PEL, without regard to the use of a respirator, wash their hands and face prior to eating, drinking, smoking or applying cosmetics.
4. The Contractor shall assure that Contractor's employees do not enter lunchroom facilities or eating areas with protective work clothing or equipment unless surface lead dust has been removed by vacuuming, downdraft booth, or other cleaning method that limits dispersion of lead dust.

E. Handwashing Facilities (required whenever lead is disturbed)
1. The Contractor shall provide adequate handwashing facilities for use by Contractor's employees exposed to lead.
2. Where showers are not provided the Contractor shall assure that Contractor's employees wash their hands and face at the end of the work shift.

3.6 MEDICAL SURVEILLANCE (required whenever lead is disturbed)

A. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by 29 CFR 1926.62 (j) Medical Surveillance.

3.7 TRAINING (required whenever lead is disturbed)

A. For all Contractor's employees who are subject to exposure to lead at or above the action level on any day or who are subject to exposure to lead compounds which may cause skin or eye irritation, the Contractor shall provide a training program in accordance with 29 CFR 1926.62 (l)(2).

3.8 SIGNS (required above the PEL)

A. The Contractor shall post the following warning signs in each work area where Contractor's employees exposure to lead is above the PEL.

WARNING
LEAD WORK AREA

POISON
NO SMOKING OR EATING

B. The Contractor shall assure that signs are illuminated and cleaned as necessary so that the legend is readily visible.

3.9 RECORDKEEPING (required whenever lead is disturbed)

A. The Contractor is responsible to establish and maintain an accurate record of all monitoring and other data used in conducting Contractor's employee exposure assessments and for each Contractor's employee subject to medical surveillance as required per 29 CFR 1926.62 (n).

3.10 OBSERVATION OF MONITORING (required whenever lead is disturbed)

A. The Contractor shall provide affected Contractor's employees or their designated representatives an opportunity to observe any monitoring of employee exposure to lead.

B. Whenever observation of the monitoring of employee exposure to lead requires entry into an area where the use of respirators, protective clothing or equipment is required, the Contractor shall provide the observer with and assure the use of such respirators, clothing and equipment.

C. Without interfering with the monitoring, observers shall be entitled to:
   1. Receive an explanation of the measurement procedures;
   2. Observe all steps related to the monitoring of lead performed at the place of exposure; and
   3. Record the results obtained or receive copies of the results when returned by the laboratory.

END OF SECTION 020810

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

1.2 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.3 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Newburgh Enlarged City School District.

1.4 INFORMATIONAL SUBMITTALS

A. Engineering Survey: Submit engineering survey of condition of building.

B. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property for environmental protection, for dust control, and for noise control. Indicate proposed locations and construction of barriers.

C. Schedule of selective demolition activities with starting and ending dates for each activity.

D. Predemolition photographs or video.

E. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician.

1.5 CLOSEOUT SUBMITTALS

A. Inventory of items that have been removed and salvaged.

1.6 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.7 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before selective demolition, Owner will remove the following items:

a. TBD

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: Refer to abatement specification sections.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

G. Arrange selective demolition schedule so as not to interfere with Owner's operations.

1.8 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

C. Inventory and record the condition of items to be removed and salvaged.

3.2 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
   1. Arrange to shut off utilities with utility companies.
   2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
   3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.

a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.4 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
4. Maintain fire watch during and for at least 1/2 hour after flame-cutting operations.
5. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

6. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.6 CLEANING

A. Remove demolition waste materials from Project site and recycle or dispose of them according to Section 017419 "Construction Waste Management and Disposal."

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 03 10 00 - CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:

1. Form-facing material for cast-in-place concrete.
2. Shoring, bracing, and anchoring.

1.03 DEFINITIONS

A. Form-Facing Material: Temporary structure or mold for the support of concrete while the concrete is setting and gaining sufficient strength to be self-supporting.

B. Formwork: The total system of support of freshly placed concrete, including the mold or sheathing that contacts the concrete, as well as supporting members, hardware, and necessary bracing.

1.04 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review the following:

a. Special inspection and testing and inspecting agency procedures for field quality control.
b. Construction, movement, contraction, and isolation joints
c. Forms and form-removal limitations.
d. Anchor rod and anchorage device installation tolerances.

1.05 ACTION SUBMITTALS

A. Product Data: For each of the following:

1. Exposed surface form-facing material.
2. Concealed surface form-facing material.
3. Forms for cylindrical columns.
4. Form ties.
5. Form-release agent.

PART 2 - PRODUCTS

2.01 FORM-FACING MATERIALS

A. As-Cast Surface Form-Facing Material:

1. Provide continuous, true, and smooth concrete surfaces.
2. Furnish in largest practicable sizes to minimize number of joints.
3. Acceptable Materials: As required to comply with Surface Finish designations specified in Section 033000 "Cast-In-Place Concrete, and as follows:

    a. Plywood, metal, or other approved panel materials.

B. Concealed Surface Form-Facing Material: Lumber, plywood, metal, plastic, or another approved material.

1. Provide lumber dressed on at least two edges and one side for tight fit.

C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that produce surfaces not exceeding specified formwork surface class.

1. Provide forms with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

2.02 RELATED MATERIALS

A. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

B. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
2. Form release agent for form liners shall be acceptable to form liner manufacturer.

C. Form Ties: Factory-fabricated, removable or snap-off, glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
2. Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.

PART 3 - EXECUTION

3.01 INSTALLATION OF FORMWORK

A. Comply with ACI 301.

B. Construct formwork, so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 and to comply with the Surface Finish designations specified in Section 033000 "Cast-In-Place Concrete" for as-cast finishes.

C. Limit concrete surface irregularities as follows:

1. Surface Finish-1.0: ACI 117 Class D, 1 inch.

D. Construct forms tight enough to prevent loss of concrete mortar.

1. Minimize joints.
2. Exposed Concrete: Symmetrically align joints in forms.

E. Construct removable forms for easy removal without hammering or prying against concrete surfaces.

1. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces.
2. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
3. Install keyways, recesses, and other accessories, for easy removal.

F. Do not use rust-stained, steel, form-facing material.

G. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces.

1. Provide and secure units to support screed strips
2. Use strike-off templates or compacting-type screeds.

H. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible.

1. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar.

2. Locate temporary openings in forms at inconspicuous locations.

I. Chamfer exterior corners and edges of permanently exposed concrete.

J. At construction joints, overlap forms onto previously placed concrete not less than 12 inches.

K. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work.

1. Determine sizes and locations from trades providing such items.
2. Obtain written approval of Architect prior to forming openings not indicated on Drawings.

L. Construction and Movement Joints:

1. Construct joints true to line with faces perpendicular to surface plane of concrete.
2. Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
3. Place joints perpendicular to main reinforcement.

M. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection.

1. Locate ports and openings in bottom of vertical forms, in inconspicuous location, to allow flushing water to drain.
2. Close temporary ports and openings with tight-fitting panels, flush with inside face of form, and neatly fitted, so joints will not be apparent in exposed concrete surfaces.

N. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

O. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

P. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.02 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
3. Clean embedded items immediately prior to concrete placement.

3.03 REMOVING AND REUSING FORMS

A. Formwork for sides of columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.

B. Clean and repair surfaces of forms to be reused in the Work.

1. Split, frayed, delaminated, or otherwise damaged form-facing material are unacceptable for exposed surfaces.
2. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints.

1. Align and secure joints to avoid offsets.
2. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.04 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:

1. Inspect formwork for shape, location, and dimensions of the concrete member being formed.

END OF SECTION 031000

SECTION 032000 - CONCRETE REINFORCING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Steel reinforcement bars.
2. Welded-wire reinforcement.

B. Related Requirements:

1. Section 033816 "Unbonded Post-Tensioned Concrete" for reinforcing related to post-tensioned concrete.
2. Section 034100 "Precast Structural Concrete" for reinforcing used in precast structural concrete.
3. Section 034500 "Precast Architectural Concrete" for reinforcing used in precast architectural concrete.
4. Section 321313 "Concrete Paving" for reinforcing related to concrete pavement and walks.
5. Section 321316 "Decorative Concrete Paving" for reinforcing related to decorative concrete pavement and walks.

1.02 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review the following:

a. Special inspection and testing and inspecting agency procedures for field quality control.
b. Construction contraction and isolation joints.
c. Steel-reinforcement installation.

1.03 ACTION SUBMITTALS

A. Product Data: For the following:

1. Each type of steel reinforcement.
2. Bar supports.

B. Shop Drawings: Comply with ACI SP-066:

1. Include placing drawings that detail fabrication, bending, and placement.
2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, tie spacing, hoop spacing, and supports for concrete reinforcement.

1.04 INFORMATIONAL SUBMITTALS

A. Material Test Reports: For the following, from a qualified testing agency:

1. Steel Reinforcement:

1.05 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

1. Store reinforcement to avoid contact with earth.

PART 2 - PRODUCTS

2.01 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.

2.02 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.

1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

B. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch in diameter.

1. Finish: Plain.

2.03 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

PART 3 - EXECUTION

3.01 PREPARATION

A. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.02 INSTALLATION OF STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.

B. Accurately position, support, and secure reinforcement against displacement.

1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
2. Do not tack weld crossing reinforcing bars.

C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.

D. Provide concrete coverage in accordance with ACI 318.

E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

F. Splices: Lap splices as indicated on Drawings.

1. Bars indicated to be continuous, and all vertical bars to be lapped not less than 36 bar diameters at splices, or 24 inches, whichever is greater.
2. Stagger splices in accordance with ACI 318.

3.03 INSTALLATION TOLERANCES

A. Comply with ACI 117.

3.04 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:

1. Steel-reinforcement placement.

END OF SECTION 032000

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

1. Section 031000 "Concrete Forming and Accessories" for form-facing materials.
2. Section 032000 "Concrete Reinforcing" for steel reinforcing bars.
3. Section 312013 "Earth Moving for Buildings" for footing subbase and backfill.

1.02 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.03 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.
d. Concrete Subcontractor.

2. Review the following:

a. Special inspection and testing and inspecting agency procedures for field quality control.
b. Anchor rod and anchorage device installation tolerances.
c. Cold and hot weather concreting procedures.
d. Concrete finishes and finishing.

e. Curing procedures.
f. Forms and form-removal limitations.
g. Concrete repair procedures.
h. Concrete protection.

1.04 ACTION SUBMITTALS

A. Product Data: For each of the following.

1. Fly ash.
2. Slag cement.
3. Blended hydraulic cement.
4. Silica fume.
5. Performance-based hydraulic cement
6. Aggregates.
7. Admixtures:

a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.

8. Curing materials.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Maximum w/cm.
4. Slump limit.
5. Air content.
6. Nominal maximum aggregate size.
7. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
8. Intended placement method.
9. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:

1. Ready-mixed concrete manufacturer.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Curing compounds.

C. Material Test Reports: For the following, from a qualified testing agency:

1. Fly ash.
2. Slag cement.
3. Blended hydraulic cement.
4. Silica fume.
5. Performance-based hydraulic cement.
6. Aggregates.

D. Research Reports:

1. For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.

E. Preconstruction Test Reports: For each mix design.

1.06 QUALITY ASSURANCE

A. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated and employing an ACI-certified Concrete Quality Control Technical Manager.

1. Personnel performing laboratory tests to be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor to be an ACI-certified Concrete Laboratory Testing Technician, Grade II.

1.07 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.

1. Include the following information in each test report:

a. Admixture dosage rates.
b. Slump.

c. Air content.
d. Seven-day compressive strength.
e. 28-day compressive strength.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301.

1.09 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1 and as follows.

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.
5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:

1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.01 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.02 CONCRETE MATERIALS

A. Source Limitations:

1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.

2. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
3. Obtain aggregate from single source.
4. Obtain each type of admixture from single source from single manufacturer.

B. Cementitious Materials:

1. Fly Ash: ASTM C618, Class C or F.
2. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
3. Blended Hydraulic Cement: ASTM C595/C595M, Type IS Portland blast-furnace slag, Type IP Portland-pozzolan, Type IL Portland-limestone, or Type IT ternary blended cement.
4. Silica Fume: ASTM C1240 amorphous silica.
5. Performance-Based Hydraulic Cement: ASTM C1157/C1157M: Type GU, general use.

C. Normal-Weight Aggregates: ASTM C33/C33M, Class 4S coarse aggregate or better, graded. Provide aggregates from a single source.

1. Alkali-Silica Reaction: Comply with one of the following:

   a. Expansion Result of Aggregate: Not more than 0.04 percent at one-year when tested in accordance with ASTM C1293.
   b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567.
   c. Alkali Content in Concrete: Not more than 4 lb./cu. yd. for moderately reactive aggregate or 3 lb./cu. yd. for highly reactive aggregate, when tested in accordance with ASTM C1293 and categorized in accordance with ASTM C1778, based on alkali content being calculated in accordance with ACI 301.

2. Maximum Coarse-Aggregate Size: 1 inch nominal.
3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Air-Entraining Admixture: ASTM C260/C260M.

E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.

6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.

F. Water and Water Used to Make Ice: ASTM C94/C94M, potable

2.03 CURING MATERIALS

A. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.

2.04 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.

1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.

B. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, and concrete with a w/cm below 0.50.

2.05 CONCRETE MIXTURES

A. Normal-weight concrete used for footings, and piers.

1. Exposure Class: ACI 318 F2.
2. Minimum Compressive Strength: 4500 psi at 28 days.
3. Maximum w/cm: 0.45.
4. Slump Limit: 8 inches, plus or minus 1 inch for concrete with verified slump of 3 inches plus or minus 1 inch before adding high-range water-reducing admixture or plasticizing admixture at Project site.
5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1-inch nominal maximum aggregate size.
6. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

2.06 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M, and furnish batch ticket information.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:

1. Daily access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.03 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.

3.04 JOINTS

A. Construct joints true to line, with faces perpendicular to surface plane of concrete.

B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.

1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
2. Place joints perpendicular to main reinforcement.

    a. Continue reinforcement across construction joints unless otherwise indicated.
    b. Do not continue reinforcement through sides of strip placements of floors and slabs.

3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

3.05 CONCRETE PLACEMENT

A. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.

B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.

1. With each concrete mixture submittal, indicate amounts of mixing water to be withheld for later addition at Project site.
2. Water added must not increase the water-cement ratio past the approved mix design ratio.
3. Add additional water reducer or plasticizer to mix instead of adding water to achieve flowable, workable concrete. Do not add water to concrete after adding these admixtures to mixture.
4. Do not add water after truck is more than half empty.

C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.

1. If a section cannot be placed continuously, provide construction joints as indicated.
2. Deposit concrete to avoid segregation.
3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.

    a. Do not use vibrators to transport concrete inside forms.

b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

3.06 FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:

1. ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.

a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
b. Remove projections larger than 1 inch.
c. Tie holes do not require patching.
d. Surface Tolerance: ACI 117 Class D.
e. Apply to concrete surfaces not exposed to public view.

2. ACI 301 Surface Finish SF-2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams.

a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
b. Remove projections larger than 1/4 inch.
c. Patch tie holes.
d. Surface Tolerance: ACI 117 Class B.
e. Locations: Apply to concrete surfaces exposed to public view,.

B. Rubbed Finish: Apply the following to as cast surface finishes where indicated on Drawings:

1. Smooth-Rubbed Finish:

a. Perform no later than one day after form removal.
b. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture.
c. If sufficient cement paste cannot be drawn from the concrete by the rubbing process, use a grout made from the same cementitious materials used in the in-place concrete.

C. Related Unformed Surfaces:

1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a color and texture matching adjacent formed surfaces.
2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.07 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling In:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

3.08 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.

B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:

1. Cure formed concrete surfaces.
2. If forms remain during curing period, moist cure after loosening forms.
3. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:

    a. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.

        1) Recoat areas subject to heavy rainfall within three hours after initial application.
        2) Maintain continuity of coating and repair damage during curing period.

C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:

1. Begin curing immediately after finishing concrete.
2. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.

a. Recoat areas subject to heavy rainfall within three hours after initial application.
b. Maintain continuity of coating and repair damage during curing period.

3.09 TOLERANCES

A. Conform to ACI 117.

3.10 CONCRETE SURFACE REPAIRS

A. Defective Concrete:

1. Repair and patch defective areas when approved by Engineer or Architect.
2. Remove and replace concrete that cannot be repaired and patched to Engineer's or Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part Portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.

a. Limit cut depth to 3/4 inch.
b. Make edges of cuts perpendicular to concrete surface.
c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
d. Fill and compact with patching mortar before bonding agent has dried.
e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white Portland cement and standard Portland cement, so that, when dry, patching mortar matches surrounding color.

a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
b. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance as determined by Architect.

D. Repair materials and installation not specified above may be used, subject to Engineer's or Architect's approval.

3.11 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.

B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

1. Testing agency to immediately report to Engineer, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
2. Testing agency to report results of tests and inspections, in writing, to Owner, Engineer, Contractor, and concrete manufacturer within 48 hours of inspections and tests.

a. Test reports to include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:

1) Project name.
2) Name of testing agency.
3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
4) Name of concrete manufacturer.
5) Date and time of inspection, sampling, and field testing.
6) Date and time of concrete placement.
7) Location in Work of concrete represented by samples.
8) Date and time sample was obtained.
9) Truck and batch ticket numbers.
10) Design compressive strength at 28 days.
11) Concrete mixture designation, proportions, and materials.
12) Field test results.
13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
14) Type of fracture and compressive break strengths at seven days and 28 days.

C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.

D. Inspections:

1. Headed bolts and anchors.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.
4. Curing procedures and maintenance of curing temperature.
5. Verification of concrete strength before removal of shores and forms from beams and slabs.
6. Batch Plant Inspections: On a random basis, as determined by Architect.

E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M to be performed in accordance with the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.

    a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C143/C143M:

    a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
    b. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete;.

    a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

4. Concrete Temperature: ASTM C1064/C1064M:

    a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.

5. Compression Test Specimens: ASTM C31/C31M:

    a. Cast and laboratory cure six (6) 6-inch by 12-inch or 4-inch by 8-inch cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C39/C39M.

    a. Test two standard cured specimens at 7 days, three specimens at 28 days, and retain one specimen for testing at 56 days as deemed necessary by Architect.

b. A compressive-strength test to be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

7. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
8. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
9. Additional Tests:

    a. Testing and inspecting agency to make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
    b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.

        1) Acceptance criteria for concrete strength to be in accordance with ACI 301, Section 1.6.6.3.

10. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
11. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION 033000

SECTION 040120 - BRICK MASONRY REPAIR

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes repairing brick masonry.

1.2 UNIT PRICES

A. Work of this Section is affected by unit prices specified in Section 012200 "Unit Prices."

1.3 DEFINITIONS

A. Rebuilding (Setting) Mortar: Mortar used to set and anchor masonry in a structure, distinct from pointing mortar installed after masonry is set in place.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Newburgh Enlarged City School District

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Include plans, elevations, sections, and locations of replacement bricks on the structure.
2. Show provisions for expansion joints or other sealant joints.

C. Samples: For each exposed product and for each color and texture specified.

1.6 INFORMATIONAL SUBMITTALS

A. Quality-control program.

1.7 QUALITY ASSURANCE

A. Brick Masonry Repair Specialist Qualifications: Engage an experienced brick masonry repair firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service
performance. Experience in only installing masonry is insufficient experience for masonry repair work.

B. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising performance and preventing damage.

C. Mockups: Prepare mockups of brick masonry repair to demonstrate aesthetic effects and to set quality standards for materials and execution and for fabrication and installation.

1. Masonry Repair: Prepare sample areas for each type of masonry repair work performed. If not otherwise indicated, size each mockup not smaller than two adjacent whole units or approximately 48 inches (1200 mm) in least dimension. Construct sample areas in locations in existing walls where directed by Architect unless otherwise indicated. Demonstrate quality of materials, workmanship, and blending with existing work.

PART 2 - PRODUCTS

2.1 MASONRY MATERIALS

A. Face Brick: As required to complete brick masonry repair work.

1. Brick Matching Existing: Units with colors, color variation within units, surface texture, size, and shape that match existing brickwork.

a. For existing brickwork that exhibits a range of colors or color variation within units, provide brick that proportionally matches that range and variation rather than brick that matches an individual color within that range.

2. Special Shapes:

a. Provide molded, 100 percent solid shapes for applications where core holes or "frogs" could be exposed to view or weather when in final position and where shapes produced by sawing would result in sawed surfaces being exposed to view.
b. Provide specially ground units, shaped to match patterns, for arches and where indicated.
c. Mechanical chopping or breaking brick, or bonding pieces of brick together by adhesive, are unacceptable procedures for fabricating special shapes.

B. Building Brick: ASTM C62, Grade SW where in contact with earth or Grade SW, MW, or NW for concealed backup; and of same vertical dimension as face brick, for

masonry work concealed from view.

2.2 MORTAR MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or Type II, except Type III may be used for cold-weather construction; white (or gray, or both) where required for color matching of mortar.

1. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C114.

B. Hydrated Lime: ASTM C207, Type S.

C. Masonry Cement: ASTM C91/C91M.

D. Mortar Cement: ASTM C1329/C1329M.

E. Mortar Sand: ASTM C144.

1. Exposed Mortar: Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.
2. Colored Mortar: Natural sand or ground marble, granite, or other sound stone of color necessary to produce required mortar color.

F. Mortar Pigments: ASTM C979/C979M, compounded for use in mortar mixes, and having a record of satisfactory performance in masonry mortars.

G. Water: Potable.

2.3 MANUFACTURED REPAIR MATERIALS

A. Brick Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching brick masonry.

1. Use formulation that is vapor and water permeable (equal to or more than the brick), exhibits low shrinkage, has lower modulus of elasticity than bricks being repaired, and develops high bond strength to all types of masonry.
2. Formulate patching compound in colors and textures to match each brick being patched.

2.4 ACCESSORY MATERIALS

A. Setting Buttons and Shims: Resilient plastic, nonstaining to masonry, sized to suit joint thicknesses and bed depths of bricks, less the required depth of pointing materials unless removed before pointing.

B. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:

1. Previous effectiveness in performing the work involved.
2. Minimal possibility of damaging exposed surfaces.
3. Consistency of each application.
4. Uniformity of the resulting overall appearance.
5. Do not use products or tools that could leave residue on surfaces.

2.5 MORTAR MIXES

A. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.

B. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.

C. Do not use admixtures in mortar unless otherwise indicated.

D. Mixes: Mix mortar materials in the following proportions:

1. Rebuilding (Setting) Mortar by Volume: ASTM C270, Proportion Specification, [1 part portland cement, 1 part lime, and 6 parts sand] <Insert proportions>.

PART 3 - EXECUTION

3.1 BRICK REMOVAL AND REPLACEMENT

A. At locations indicated, remove bricks that are damaged, spalled, or deteriorated (or are to be reused. Carefully remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.

B. Support and protect remaining masonry that surrounds removal area.

C. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.

D. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.

E. Remove in an undamaged condition as many whole bricks as possible.

1. Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.
2. Remove sealants by cutting close to brick with utility knife and cleaning with solvents.

F. Clean masonry surrounding removal areas by removing mortar, dust, and loose particles in preparation for brick replacement.

G. Replace removed damaged brick with other removed brick in good condition, where possible, matching existing brick. Do not use broken units unless they can be cut to usable size.

H. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.

1. Maintain joint width for replacement units to match existing joints.
2. Use setting buttons or shims to set units accurately spaced with uniform joints.

I. Lay replacement brick with rebuilding (setting) mortar and with completely filled bed, head, and collar joints. Butter ends with enough mortar to fill head joints and shove into

place. Wet both replacement and surrounding bricks that have ASTM C67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min. (30 g/194 sq. cm per min.) Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.

1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.
2. When mortar is hard enough to support units, remove shims and other devices interfering with pointing of joints.

J. Curing: Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.

1. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

3.2 BRICK MASONRY PATCHING

A. Patching Bricks:

1. Remove loose material from masonry surface. Carefully remove additional material so patch does not have feathered edges but has square or slightly undercut edges on area to be patched and is at least 1/4 inch (6 mm) thick, but not less than recommended in writing by patching compound manufacturer.
2. Mask adjacent mortar joint or rake out for repointing if patch extends to edge of brick.
3. Mix patching compound in individual batches to match each unit being patched. Combine one or more colors of patching compound, as needed, to produce exact match.
4. Rinse surface to be patched and leave damp, but without standing water.
5. Brush-coat surfaces with slurry coat of patching compound according to manufacturer's written instructions.
6. Place patching compound in layers as recommended in writing by patching compound manufacturer, but not less than 1/4 inch (6 mm) or more than 2 inches (50 mm) thick. Roughen surface of each layer to provide a key for next layer.
7. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane or contour of brick. Shape and finish surface before or after curing, as determined by testing, to best match existing brick.
8. Keep each layer damp for 72 hours or until patching compound has set.

3.3 FINAL CLEANING

A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, applied by low pressure spray.

1. Do not use metal scrapers or brushes.
2. Do not use acidic or alkaline cleaners.

END OF SECTION 040120.63

SECTION 05 52 16 - ROOFTOP GUARDRAIL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section includes the following rooftop guardrail systems:
   1. Portable vertical guardrails with ballasted guardrail bases.

1.03 REFERENCES

A. Definitions: Definitions in OSHA 29 CFR 1910 and 1926 including their subparts apply to this Section.
   1. Guardrail System: A barrier erected to prevent persons from falling to lower levels.
   2. Competent Person:
      a. As defined in 29 CFR 1910.140(b) as "a person who is capable of identifying existing and predictable hazards in any personal fall protection system or any component of it, as well as in their application and uses with related equipment, and who has authorization to take prompt, corrective action to eliminate the identified hazards."
   3. Qualified Person:
      a. As defined in 29 CFR 1910.140(b) as "a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project."

B. Reference Standards: Perform Work per standards specified and as follows unless modified by requirements in the Contract Documents.
   1. American National Standards Institute (ANSI)/The American Society of Safety Professionals (ASSP):
      a. ANSI/ASSP Z359.6 - Specifications and Design Requirements for Active Fall Protection Systems."
      b. OSHA 29 CFR 1926, "Safety and Health Regulations for Construction."
         1) OSHA 29 CFR 1926, Subpart M "Fall Protection."

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate layout and installation of work of this Section with interfacing and adjoining work and other Sections affecting or affected by work of this Section for proper sequencing of each installation.

1.05 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication and assembly of guardrail systems, as well as procedures and diagrams.
   1. Show complete layout and configuration of guardrail systems including all components and accessories.
   2. Clearly indicate design and fabrication details and installation details.

1.06 INFORMATIONAL SUBMITTALS

A. Manufacturers' instructions for each product.

B. Qualification Statements for installer.
   1. Include manufacturer's approval for installer.
   2. Include list of past Projects and contacts evidencing compliance with specified qualifications.

1.07 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For guardrail systems to include in operation and maintenance manuals.
   1. Requirements for guardrail systems including complete instructions for users and building maintenance personnel for the safe and proper use, operation, and maintenance of guardrails and their components.
   2. Provisions for pre-operational, operation, and maintenance inspections. Include a Log Book outlining mandatory annual inspection requirements that are in accordance with ANSI and OSHA Regulations and Industry Standards.
   3. Plan view drawing of the building's roof, including the building name and address.
      a. Show guardrail system layout.

1.08 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer Qualifications: Minimum 10 years experience
      a. Company: One specializing in the design, fabrication and installation of guardrail systems specified in this Section and whose products have a record of successful in-service performance.
   2. Installer Qualifications: Minimum 5 years experience
      a. Company: A firm or individual certified, licensed, or otherwise qualified or employed by guardrail systems manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements. A manufacturer's willingness to sell its materials to Contractor or to an installer engaged by Contractor does not in itself confer qualification on the buyer.
      b. Project Experience: Minimum 5 years experience on at least 5 projects of similar nature in past 5 years.
      c. Staff: Employ a competent foreman who is a Competent Person as defined in

29 CFR § 1926.32(m) and who is a certified installer to supervise Work of this Section. Foreman shall be present whenever Work is in progress.

3. Welder Qualifications: Welders must be qualified to applicable AWS Standards for each type of weld required.

B. Certifications:
1. Inspection certificates for guardrail systems.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Delivery Requirements: Deliver materials in manufacturer’s undamaged packaging, complete with installation instructions.

1.10 WARRANTY

A. Manufacturer's Standard Warranty: Manufacturer agrees to repair or replace components of guardrail systems that fail in materials or workmanship within specified warranty period.
1. Warranty Period: one year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products as furnished by the following:
1. SafePro Safety Products.
2. Substitutions will be considered. Comply with provisions of Division 01 Section "SUBSTITUTION PROCEDURES."

B. Project Source Limitations: Obtain each variety of fall protection equipment, whether specified in this Section or in other Sections, through one source from a single manufacturer who is capable of showing prior successful production of units similar to those required for entire Project

2.02 DESCRIPTION

A. Rooftop guardrail systems consist of the following:
1. Portable vertical guardrails with ballasted guardrail bases.

B. Product Options: Drawings indicate suggested locations of guardrail systems and are based on the specific system indicated. Final locations shall be determined according to guardrail system manufacturer's design requirements.
1. If modifications are proposed, submit, with Shop Drawings, comprehensive explanatory data to Architect for review.

C. Regulatory Requirements: Provide rooftop guardrail systems designed and constructed to suit building configuration and in accordance with the Contract Documents and applicable regulations and codes.
1. Comply with the following OSHA regulations:
a. OSHA 29 CFR 1926, Subpart M "Fall Protection."

2.03 PERFORMANCE / DESIGN CRITERIA

1. Structural Performance Criteria: Provide rooftop guardrail systems complying with specific performance and design criteria indicated, capable of withstanding, without failure, the effects of gravity loads and in-use loads and stresses under conditions indicated or reasonably anticipated. Include necessary modifications to meet required criteria.
    a. Contract Documents may indicate certain performance requirements, features, and primary components required, but do not cover details of design and construction, and do not purport to identify nor solve problems of thermal or structural movement or moisture disposal. Requirements shown by details are intended to establish basic locations and dimension of rooftop guardrail systems.
    b. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
    c. Compliance with requirements of authorities having jurisdiction is the responsibility of Contractor.

2.04 GUARDRAILS

A. Design Criteria: Design for the following:
    1. Top rail 42 inches high and capable of withstanding a load of at least 200 lbf (0.89 kN) applied in any direction at any point.
    2. Midrail at 21 inches high and capable of withstanding a force of at least 150 lbf (0.67 kN) applied in any downward or outward direction at any point.

B. Portable Guardrail System: 29 CFR 1910.29(b) compliant, free-standing, non-penetrating, counterweighted, 42 inch high guardrail system to prevent falls from open sides of roof including railing sections and ballasted bases required for a complete installation.
    1. Basis of Design Product: Portable Guardrail Panels by SafePro Safety Products.
    2. Supports every 8 feet (2438 mm)
    3. Maximum Assembled System Weight: Not more than 5 psi (34 kPa) at bases.
    4. Counterweighted Guardrail Bases: Cast iron with three off-centered stanchion receiver sockets.
        a. Nominal Size: 24 inch deep by 18 inch wide by 2-1/2 inch high (609 mm deep by 457 mm wide by 64 mm high) design to prevent water ponding. Cast or smooth edges to prevent damage to roof.
        b. Finish: Galvanized.
    5. Roof Protection Pads: 1/4 inch (12.7 mm) thick, resilient pad larger than bases and compatible with roof membrane.
    6. Tubing: ASTM A 500/A500M, Galvanized
        a. Rail Units: Single length pipe top rail bent into inverted U with factory welded midrail.
        b. Finish: Hot-dip galvanized.

2.05 FASTENERS

A. General: Select fasteners and anchors for type, grade, and class required. Unless otherwise indicated, provide fasteners as follows:
    1. Material for exterior locations in contact with aluminum: Type 304 stainless-steel

fasteners.

2. Material for exterior locations exposed to weather hot-dip galvanized fasteners per ASTM F2329.

B. Stainless Steel Bolts and Nuts: ASTM F593 regular hexagon-head annealed stainless steel bolts; with ASTM F594 hex nuts; and, where indicated, flat washers; Alloy Group 1.

C. Stainless Steel Washers: ASTM A240/A 240M, Type 304 and ANSI B18.22.1, Type A Plain.

D. High-Strength Steel Bolts and Nuts: ASTM A325, Type 3 regular hexagon-head bolts; with ASTM A563, Grade C3 hex nuts; and, where indicated, flat washers.

E. Steel Bolts and Nuts: ASTM A307, Grade A regular hexagon-head bolts; with ASTM A563 hex nuts; and, where indicated, flat washers.

F. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors designed for and recommended by anchorage manufacturer for conditions encountered.

2.06 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

2.07 FABRICATION

A. Factory fabricate portable guardrail sections to include top rail bent downward to form two upright posts with a midrail welded between the uprights.

2.08 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.

1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:

1. Examine roof and other mounting surfaces for suitable conditions where

guardrail systems will be installed for compliance with requirements for operational clearances and other conditions affecting performance of work.

2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

A. Comply with manufacturer's written installation instructions and recommendations, referenced standards, requirements of authorities having jurisdiction, and approved submittals.

B. Install products in place to obtain the required working loads without exceeding allowable loads for each guardrail system.

3.03 REPAIR

A. Repairing Damaged Finishes: Immediately after installation, clean abraded and other areas where coatings are damaged.
1. Galvanized Surfaces: Clean bolted connections and abraded areas and repair galvanizing to comply with ASTM A780/A780M.
2. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish per manufacturer's written instructions.

3.04 FIELD QUALITY CONTROL

A. Manufacturer's Field Services:
1. Require product manufacturers to provide field surveillance of the installation of their products.
2. Monitor and report installation procedures, and unacceptable conditions.
3. Engage manufacturer's Qualified Person to perform field tests and inspections and to prepare test reports.

B. Testing Services: Testing and inspecting of completed applications of guardrail system work shall take place in successive stages as guardrail systems are installed. Do not proceed with work for the next area until test results for previously completed applications of work show compliance with requirements.

C. Do not load or stress system until materials and fasteners are properly installed and ready for service.

D. Remove and replace work where test results indicate that it does not comply with specified requirements.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.05 PROTECTION

A. Protect roof surfaces from damage during installation.

END OF SECTION 05 52 16

SECTION 07620 - SHEET METAL FLASHING AND TRIM

PART 1- GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following sheet metal flashing and trim:
   1. Formed roof flashing and trim.

1.3 PERFORMANCE REQUIREMENTS

A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.

B. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

   1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

C. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include manufacturer's technical product data, installation instructions, general recommendations, construction details, material descriptions, dimensions of individual components and profiles, and finishes, for both fabricated and manufactured products.

B. Shop Drawings: Show layouts of sheet metal flashing and trim, including plans and elevations. Distinguish between shop- and field-assembled work. Include the following:

   1. Identify material, thickness, weight, and finish for each item and location in Project.

2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.

3. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining work.

4. Details of expansion-joint covers, including showing direction of expansion and contraction.

C. Samples for Initial Selection: For each type of sheet metal flashing and trim indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Sheet Metal Flashing: 12 inches (300 mm) long. Include fasteners, cleats, clips, closures, and other attachments.

2. Trim: 12 inches (300 mm) long. Include fasteners and other exposed accessories.

3. Accessories: Full-size Sample.

4. Manufactured flashings, fascia and trim: 12 inches (300 mm) long. Include fasteners, cleats, clips, closures, and other attachments.

E. Certification: Notarized certification from fluoropolymer finish provider indicating that paint system has been applied after sheet metal was formed and that application complies with these specifications.

1.5 QUALITY ASSURANCE

A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.

B. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack materials on platforms or pallets, covered with suitable weathertight and ventilated covering. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

1.7 COORDINATION

A. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

A. SHEET METALS

1. Aluminum Sheet: ASTM B 209 (ASTM B 209M), Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, finished as follows:

Locations:
a. All schools; Flashings related to the roof assembly, that are not visible from the elevations, shall be fabricated from minimum .0625” clear mill-finished aluminum, unless noted otherwise.
b. All schools; Flashings that are visible from the elevations, shall be fabricated from .0625” clear annodized aluminum. Match existing in profile, finish and assembly.

2.2 UNDERLAYMENT MATERIALS

A. Polyethylene Sheet: 6-mil- (0.15-mm-) thick polyethylene sheet complying with ASTM D 4397.
B. Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
C. Slip Sheet: Rosin-sized paper, minimum 3 lb/100 sq. ft. (0.16 kg/sq. m).

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
1. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.

2. Blind Fasteners: High-strength aluminum or stainless-steel rivets.

C. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.

D. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

E. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

F. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

G. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.4 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.

B. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

C. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.

1. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

D. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.

E. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with elastomeric sealant concealed within joints.

F. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.

G. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

H. Thickness: As indicated on the drawings, or as required to meet or exceed thickness recommended by SMACNA's "Architectural Sheet Metal Manual" for application but not less than .0625”.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work.

B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
   1. Torch cutting of sheet metal flashing and trim is not permitted.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.

   1. Coat side of uncoated aluminum sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.

   2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene underlayment.

   3. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.

C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.

D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and elastomeric sealant.

E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered

before fabricating sheet metal. Provide wood blocking and backing as indicated, or as required to provide tight, true, secure installation free of oil caning or surface irregularities.

1. Use continuous cleats wherever possible. Space non- continuous cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.

F. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with elastomeric sealant concealed within joints.

G. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.

1. Aluminum: Use aluminum or stainless-steel fasteners.

H. Seal joints with elastomeric sealant as required for watertight construction.

1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).

2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

I. Aluminum Flashing: Rivet or weld joints in uncoated aluminum where necessary for strength.

3.3 ROOF FLASHING INSTALLATION

A. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.

B. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Install flashing as follows:

1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.

2. Seal with [elastomeric] sealant and clamp flashing to pipes penetrating roof except for lead flashing on vent piping.

3.4 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Openings Flashing in Frame Construction: Install continuous head, sill, and similar flashings to extend 4 inches (100 mm) beyond wall openings.

3.5 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder and sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07620

SECTION 07720 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Equipment curbs.

1.3 SUBMITTALS

A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.

B. Product data for each type of product specified. Submit manufacturer's detailed technical product data, installation instructions and recommendations, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.

C. Shop drawings showing fabrication and installation of each roof accessory specified including fully dimensioned plans, elevations, sections, details of components, and attachments to other units of Work. Also show layout, anchorage details, rough-in requirements, and conditions on the roof or for other accessories.

D. Samples for initial selection purposes in the form of manufacturer's color charts showing full range of colors, textures, shapes, and sizes available for each type of roof accessory indicated.

1.4 QUALITY ASSURANCE

A. Heat-and-Smoke Vent Compliance: Provide units that have been tested, listed, or approved as follows:
1. Construction/Operation: UL-listed.
2. Fire Resistance of Lids: UL Class A rating.

B. Standards: Comply with the following:

1. SMACNA "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap-flashing to coordinate with type of roofing indicated.

2. NRCA "Roofing and Waterproofing Manual" details for installation of units.
3. NFPA 204M for smoke-and-heat vent design constraints, operation, and location.

PART 2 - PRODUCTS

Roof Curbs:

A. Provide replacement curbs wherever required to obtain 12” min. clear from top of built-up asphalt membrane to top of curb at all curb-mounted mechanical equipment.

B. Provide internally reinforced metal roof curbs with integral metal cant. Match existing sizes. Flash curbs into built-up roofing and extend flashing onto and across top of curb surface. Provide factory-insulated galvanized steel units as manufactured by:

Conn-fab Sales, Inc.
Curbs Plus, Inc.
Metallic Products Corp.
Uni-Curb, Inc.

2.1 MATERIALS, GENERAL

A. Aluminum Sheets: ASTM B 209 for Alclad alloy 3005H25 or alloy and temper required to suit forming operations with mill finish, unless indicated otherwise.

B. Extruded Aluminum: ASTM B 221 alloy 6063-T52 or alloy and temper required to suit structural and finish requirements. Mill finish, unless indicated otherwise.

C. Structural-Quality Galvanized Steel Sheet: ASTM A 446 with G90 coating complying with ASTM A 525, Grade C, or to suit manufacturer's standards.

D. Commercial-Quality Galvanized Steel Sheet: ASTM A 526 with G90 coating complying with ASTM A 525.

E. Galvalume-Coated Steel Sheet: ASTM A 792 with class AZ-50 coating, Grade 40, or to suit manufacturer's standards.

F. Insulation: Manufacturer's standard rigid or semirigid glass-fiber board of thickness indicated.

G. Wood Nailers: Softwood lumber, pressure treated with water-borne preservatives for above-ground use, complying with AWPA C2; not less than 1-1/2 inch thick.

H. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.

1. Where removal of exterior exposed fasteners affords access to building, provide nonremovable fastener heads.

I. Gaskets: Manufacturer's standard tubular or fingered design of neoprene or polyvinyl chloride, or block design of sponge neoprene.

J. Bituminous Coating: SSPC-Paint 12, solvent-type bituminous mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coating.

K. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

L. Elastomeric Sealant: Generic type recommended by unit manufacturer that is compatible with joint surfaces; ASTM C 920, Type S, Grade NS, Class 25, and Uses NT, G, and, A.

M. Roofing Cement: ASTM D 4586, nonasbestos, fibrated asphalt cement designed for trowel application or other adhesive compatible with roofing system.

2.2 FINISHES

A. General: Comply with NAAMM "Metal Finishes Manual" for recommendations on applying and designating finishes.

B. Finish designations prefixed by AA conform to the system for designating aluminum finishes established by the Aluminum Association.

C. Class I, Clear-Anodized Finish: AA-C22A41 (Chemical Finish: etched, medium matte; Anodic Coating: Class I Architectural, clear film thicker than 0.7 mil) complying with AAMA 607.1.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Comply with manufacturer's instructions and recommendations. Coordinate with installation of roof deck and other substrates to receive accessory units, vapor barriers, roof insulation, roofing and flashing, as required, to ensure that each element of the Work performs properly and that combined elements are waterproof and weathertight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses, as well as inward and outward loading pressures.

1. Except as otherwise indicated, install roof accessory items according to construction details of NRCA "Roofing and Waterproofing Manual."

B. Isolation: Where metal surfaces of units are to be installed in contact with incompatible metal or corrosive substrates, including wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation.

C. Flange Seals: Unless otherwise indicated, set flanges of accessory units in a thick bed of roofing cement to form a seal.

D. Cap Flashing: Where cap flashing is required as component of accessory, install to provide adequate waterproof overlap with roofing or roof flashing (as counterflashing). Seal with thick bead of mastic sealant, except where overlap is indicated to be left open for ventilation.

E. Operational Units: Test operate units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

3.2 CLEANING AND PROTECTION

A. Clean exposed metal and plastic surfaces according to manufacturer's instructions. Touch up damaged metal coatings.

END OF SECTION 07720

SECTION 078413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Penetrations in fire-resistance-rated walls.
2. Penetrations in horizontal assemblies.
3. Penetrations in smoke barriers.

1.2 ACTION SUBMITTALS

A. Product data.

B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer’s written recommendations.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for penetration firestopping.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Approvals according to FM Approvals 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics:

1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.

2. Test in accordance with testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:

    a. Penetration firestop systems installed with products bearing the classification marking of a qualified product certification agency in accordance with listed system designs published by a qualified testing agency.

2.2 PENETRATION FIRESTOPPING SYSTEMS

A. Description: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems are to be compatible with one another, with the substrates forming openings, and with penetrating items if any.

1. A/D Fire Protection Systems, Inc.
2. Grace Construction Products
3. Hilti, Inc.
4. Johns Manville
5. Nelson Firestop Products
6. NUCO Inc.
7. Passive Fire Protection Partners
8. RectorSeal Corporation
9. Specified Technologies, Inc.
10. 3M Fire Protection Products
11. Tremco, Inc.; Tremco Fire Protection Systems Group
12. USG Corporation

B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined in accordance with ASTM E814 or UL 1479.

1. F-Rating: Not less than the fire-resistance rating of the wall penetrated.
2. Membrane Penetrations: Install recessed fixtures such that the required fire resistance will not be reduced.

C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined in accordance with ASTM E814 or UL 1479.

1. F-Rating: At least one hour, but not less than the fire-resistance rating of the floor penetrated.
2. T-Rating: At least one hour, but not less than the fire-resistance rating of the floor. The following floor penetrations do not require a T-rating:

    a. Those within the cavity of a wall.
    b. Floor, tub, or shower drains within a concealed space.
    c. 4-inch or smaller metal conduit penetrating directly into metal-enclosed electrical switchgear.

D. Penetrations in Smoke Barriers: Penetration firestopping systems with ratings determined in accordance with UL 1479.

E. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, in accordance with ASTM E84.

F. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.

1. Permanent forming/damming/backing materials, including the following:
   a. Slag-wool-fiber or rock-wool-fiber insulation
   b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state
   c. Fire-rated foam board
   d. Fillers for sealants
2. Temporary forming materials
3. Substrate primers
4. Collars
5. Steel sleeves

PART 3 - EXECUTION

3.1 INSTALLATION OF PENETRATION FIRESTOPPING SYSTEMS

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

B. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.

C. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.

D. Install fill materials by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.2 IDENTIFICATION

A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.

1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet from end of wall and at intervals not exceeding 30 feet.

B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Designation of applicable testing and inspecting agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.3 FIELD QUALITY CONTROL

A. Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2174.

B. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.

C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

END OF SECTION 078413

SECTION 07920 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes joint sealants for the following applications, including those specified by reference to this Section:

1. Exterior joints in the following vertical surfaces and horizontal nontraffic surfaces:

Roof flashing joints

B. Related Sections include the following:

1. Division 7 Section "Sheet Metal Flashing & Trim" for joints in flashings and at their terminations.

1.3 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

1. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

2. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

3. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.

4. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

a. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.

b. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

5. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.

6. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).

2. When joint substrates are wet.

3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.

4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

1. Additional Movement Capability: Where additional movement capability is specified in Elastomeric Joint Sealant Data Sheet, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements of ASTM C 920 for Uses indicated.

B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

C. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

2.4 JOINT SEALANTS

A. Sealant for exterior and interior joints in vertical surfaces of masonry and concrete; between masonry and metal; between metal and metal and general sealant joints.

Single part neutral curing silicone sealant.
Type: S
Grade: NS
Class: 25
Maximum movement: +50%
Uses: NT, M, G, A, 0.

1. Products: Subject to compliance with requirements, provide one of the following:

Dow corning 795, Dow Corning Corporation.
Silpruf, General Electric Company.
Spectrem 2, Tremco.

2.5 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), O (open-cell material), B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application

indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include but are not limited to the following:

1. Concrete.
2. Masonry.
3. Unglazed surfaces of ceramic tile.

3. Remove laitance and form-release agents from concrete.

4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include but are not limited to the following:

    1. Metal.
    2. Glass.
    3. Porcelain enamel.
    4. Glazed surfaces of ceramic tile.

5. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

6. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

    1. Provide acoustical sealants at perimeter partitions of all classrooms, laboratory classrooms, computer classrooms, offices and conference rooms.

D. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

    1. Do not leave gaps between ends of sealant backings.
    2. Do not stretch, twist, puncture, or tear sealant backings.
    3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

F. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

H. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07920

SECTION 09900 - PAINTING AND FINISHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions and all Division 1 Specification sections apply to the work of this Section.

1.2 DESCRIPTION OF WORK:

A. The extent of painting and finishing work is as shown and scheduled on Drawings and as specified herein.

B. The work includes preparing surfaces (including but not limited to scraping, sanding, chemically stripping, filling, and smoothing) and painting and finishing exterior and interior new and existing exposed items and surfaces throughout project, including gymnasium, except as otherwise indicated.

1. Surface preparation, priming, and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections of the Work.

C. Paint as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers, decorative textures and fillers, and other applied materials whether used as prime, intermediate, or finish coats.

D. Paint exposed surfaces whether or not colors are designated in schedules, except where natural finish or material is specifically noted as a surface not to be painted. If color or finish is not designated, Architect will select these.

1. Where unscheduled, incidental, unfinished material exposed to view occurs, the material shall be painted in a color to be selected by the Architect, whether or not specifically identified in the Contract Documents.

E. Colors will be as scheduled and, if not scheduled, to those from manufacturer's full range of colors.

F. Following categories of work are not included as part of field-applied finish work, or are included in other sections of these specifications:

1. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under various sections for structural steel, miscellaneous metal, hollow metal work, and similar items as well as for fabricated components such as wood casework and shop-fabricated or factory-built mechanical and electrical equipment or accessories.

2. Prefinished Items: Unless otherwise indicated, do not include painting when factory finishing or installer finishing is specified.

3. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, pipe spaces, and duct shafts.

4. Finished Metal Surfaces: Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting, unless otherwise indicated.

5. Operating Parts and Labels: Moving parts of operating units and mechanical and electrical parts will not require finish painting, unless otherwise indicated. Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

1.3 QUALITY ASSURANCE:

A. Painting and Finishing Subcontractor: Work must be performed by a firm having not less than five (5) years successful experience in comparable painting and finishing.

1. Only skilled journeymen painters and finishers shall be used for this work.

2. In acceptance or rejection of painting and finishing work, no allowance will be made for lack of skill on the part of the workmen.

B. Paint Coordination: Provide finish coats that are compatible with prime paints used. Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information on characteristics of finish materials proposed for use to ensure compatible prime coats are used. Provide barrier coats over incompatible primers or remove and reprime as required. Notify Architect in writing of any anticipated problems using specified coating systems with substrates primed by others.

C. Scheduling: Schedule painting and finishing so that wet work will not be harmed or marred by airborne dust or debris from other construction work.

1.4 SUBMITTALS:

A. Product Data: Submit manufacturer's technical information including paint label analysis and application instructions for each material proposed for use.

1.5 DELIVERY, STORAGE, AND HANDLING:

A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:

Name or title of material
Fed. Spec. number, if applicable
Manufacturer's stock number and date of manufacture.
Manufacturer's name.
Contents, by volume, for major pigment and vehicle constituents.
Thinning instructions.

Application instructions.
Color name and number.

B. Protection:

1. Store only the approved materials at the job site. Store materials only in a suitable and designated area restricted to the storage of paint materials and related equipment.

2. Use all means necessary to ensure the safe storage and use of paint materials and the prompt and safe disposal of waste.

3. Use all means necessary to protect paint materials before, during, and after application and to protect the installed work and materials of all other trades.

4. Safety: Use all means necessary to protect all persons (whether engaged in the work of this Section or not) from all harm caused by work of this Section.

1.6 JOB CONDITIONS:

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).

B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 degrees Fahrenheit and 95 degrees Fahrenheit, unless otherwise permitted by paint manufacturer's printed instructions.

C. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85%; or to damp or wet surfaces; unless otherwise permitted by paint manufacturer's printed instructions.

D. Painting and finishing may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated and maintained within temperature and humidity limits specified by paint manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 COLORS AND FINISHES:

A. Generally, finishes are as follows:

1. Match existing CMU substrate.

B. Color Pigments: Pure non-fading, applicable types to suit substrates and service indicated.

C. Paint Coordination: Provide finish coats that are compatible with prime paints used as required in Quality Assurance section herein.

D. Environmental Regulations: Provide only materials that comply with all current State and Federal environmental regulations, including, but not limited to Volatile Organic compound content limits.

2.2 MATERIAL QUALITY:

A. Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.

B. Use only thinners approved by paint manufacturer and use only within recommended limits and when approved in advance by Architect.

2.3 PAINT MATERIALS:

A. Manufacturer:

1. All paint materials selected for coating systems for each type of surface shall be the product of a single manufacturer.

2. Paint materials listed herein, unless otherwise designated, are the product of Sherwin Williams and require no further approval as to manufacturer or catalog number.

2.4 OTHER MATERIALS:

A. Provide all other materials required for the completion of the Work, as selected by the Contractor and approved by the Architect.

PART 3 - EXECUTION

3.1 INSPECTION:

A. Applicator shall examine areas and conditions under which painting work is to be applied and notify Contractor in writing of conditions detrimental to proper and timely completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Applicator.

B. Commencement of painting and finishing work will be construed as Applicator's acceptance of surfaces and conditions within any particular area.

C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or any other conditions detrimental to formation of a durable paint film.

3.2 SURFACE PREPARATION - GENERAL:

A. Perform preparation and cleaning procedures in accordance with paint manufacturer's written instructions and as herein specified for each particular substrate condition.

B. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete

painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items. Such removal and reinstallation shall be done by workmen skilled in the trades involved.

C. Clean surfaces to be painted free from loose particles, dirt and foreign matter before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly-painted surfaces.

3.3 SURFACE PREPARATION - METAL:

A. FERROUS METALS

B. New Surfaces Without Shop Coat: Solvent clean to remove oil and grease. Surfaces that contain loose rust, loose mill scale, and other foreign substances shall be mechanically cleaned by power wire brushing.

C. Shop Coated Surfaces: Protect from corrosion before and after installation by treating corroded areas immediately upon detection. Wire brush or sand abraded or corroded spots to bright metal and touch up with red lead-based paint.

D. All Other Ferrous Metals: Thoroughly clean all surfaces by solvent cleaning and scraping, wire brushing, or grinding until they are completely free from dirt, rust, oil, and grease. Spot prime exposed metal with red lead-based paint.

3.4 GALVANIZED METAL

A. Clean free of oil and surface contaminants with non-petroleum-based solvent made specifically for use with galvanized metal.

B. Perform any further surface preparation required or recommended by manufacture of primer to be used on metal.

3.5 APPLICATION:

A. General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

B. Field spray painting is not permitted.

C. Apply additional coats to those listed in Schedule of Finish Types at no additional cost when undercoats, stains, or other conditions, show through final coat of paint, until paint film is of uniform finish, color, and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

D. Sand lightly between each succeeding enamel coat.

E. Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

F. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

G. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer.

3.6 PRIME COATS

A. Apply prime coat to material that is required to be painted or finished, and that has not been prime coated by others.

B. Recoat primed and sealed surfaces where there is evidence of suction spots, or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.

C. Primer shall always be tinted to contrast with finish coats.

3.7 FINISH COATS

A. Pigmented Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

B. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not in compliance with specified requirements.

3.8 REINSTALLATION OF REMOVED ITEMS:

A. Following completion of painting in each space, promptly reinstall all items removed for painting.

3.9 CLEANING AND PROTECTION:

A. Clean-Up: During progress of work, remove from site discarded paint materials, rubbish, cans, and rags at end of each work day.

Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

B. Protection:

1. Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.

2. Provide "Wet Paint" signs as required to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.

C. Correcting Defective Work:

1. Repair and repaint all defective surfaces that have been painted, stained, finished, or otherwise treated under this Section, to the satisfaction of the Architect and at no additional cost.

2. Rejected surfaces shall be repainted over the entire plane on which they occur (corner to corner/floor to ceiling/etc.) and as otherwise required by the Architect.

END OF SECTION 09900

SECTION 230513 - COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes general requirements for single-phase and polyphase, general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on ac power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

1.3 COORDINATION

A. Coordinate features of motors, installed units, and accessory devices to be compatible with the following:

1. Motor controllers.
2. Torque, speed, and horsepower requirements of the load.
3. Ratings and characteristics of supply circuit and required control sequence.
4. Ambient and environmental conditions of installation location.

PART 2 - PRODUCTS

2.1 GENERAL MOTOR REQUIREMENTS

A. Comply with NEMA MG 1 unless otherwise indicated.

B. Comply with IEEE 841 for severe-duty motors.

2.2 MOTOR CHARACTERISTICS

A. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 3300 feet above sea level.

B. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

2.3 POLYPHASE MOTORS

A. Description: NEMA MG 1, Design B, medium induction motor.

B. Efficiency: Energy efficient, as defined in NEMA MG 1.

C. Service Factor: 1.15.

D. Multispeed Motors: Variable torque.

1. For motors with 2:1 speed ratio, consequent pole, single winding.
2. For motors with other than 2:1 speed ratio, separate winding for each speed.

E. Multispeed Motors: Separate winding for each speed.

F. Rotor: Random-wound, squirrel cage.

G. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.

H. Temperature Rise: Match insulation rating.

I. Insulation: Class F.

J. Code Letter Designation:

1. Motors 15 HP and Larger: NEMA starting Code F or Code G.
2. Motors Smaller than 15 HP: Manufacturer's standard starting characteristic.

K. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.

2.4 POLYPHASE MOTORS WITH ADDITIONAL REQUIREMENTS

A. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.

B. Motors Used with Variable Frequency Controllers:

1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width modulated inverters.
2. Energy- and Premium-Efficient Motors: Class B temperature rise; Class F insulation.
3. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
4. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.

C. Severe-Duty Motors: Comply with IEEE 841, with 1.15 minimum service factor.

2.5 SINGLE-PHASE MOTORS

A. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:

1. Permanent-split capacitor.
2. Split phase.
3. Capacitor start, inductor run.
4. Capacitor start, capacitor run.

B. Multispeed Motors: Variable-torque, permanent-split-capacitor type.

C. Bearings: Prelubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.

D. Motors 1/20 HP and Smaller: Shaded-pole type.

E. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 230513

SECTION 230517 - SLEEVES AND SLEEVE SEALS FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Sleeves.
2. Sleeve-seal fittings.
3. Grout.
4. Silicone sealants.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

1.4 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Advance Products & Systems, Inc.
2. CALPICO, Inc.
3. GPT; an EnPro Industries company.

B. Cast-Iron Pipe Sleeves: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop collar.

C. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends and integral welded waterstop collar.

D. Galvanized-Steel Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

E. PVC Pipe Sleeves: ASTM D 1785, Schedule 40.

F. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

G. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

2.2 SLEEVE-SEAL FITTINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Advance Products & Systems, Inc.
2. CALPICO, Inc.

B. Description:

1. Manufactured plastic, sleeve-type, waterstop assembly, made for imbedding in concrete slab or wall.
2. Plastic or rubber waterstop collar with center opening to match piping OD.

2.3 GROUT

A. Description: Nonshrink, recommended for interior and exterior sealing openings in nonfire-rated walls or floors.

B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.4 SILICONE SEALANTS

A. Silicone, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant, ASTM C 920, Type S, Grade NS, Class 25, use NT.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. Dow Corning Corporation.
    b. GE Construction Sealants; Momentive Performance Materials Inc.
    c. Sherwin-Williams Company (The).

B. Silicone, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade P, Class 25, Uses T and NT. Grade P Pourable (self-leveling) formulation is for opening in floors and other horizontal surfaces that are not fire rated.

C. Silicone Foam: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION

A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.

B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.

1. Sleeves are not required for core-drilled holes.

C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.

1. Permanent sleeves are not required for holes in slabs formed by molded-PE or -PP sleeves.
2. 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.

3. Using grout or silicone sealant, seal space outside of sleeves in slabs and walls without sleeve-seal system.

D. Install sleeves for pipes passing through interior partitions.

1. Cut sleeves to length for mounting flush with both surfaces.
2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
3. Seal annular space between sleeve and piping or piping insulation; use sealants appropriate for size, depth, and location of joint.

E. Fire-Resistance-Rated Penetrations, Horizontal Assembly Penetrations, and Smoke-Barrier Penetrations: Maintain indicated fire or smoke rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with fire- and smoke-stop materials. Comply with requirements for firestopping and fill materials specified in Section 078413 "Penetration Firestopping."

3.2 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings as new walls and slabs are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout or silicone sealant, seal space around outside of sleeve-seal fittings.

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Leak Test: After allowing for a full cure, test sleeves and sleeve seals for leaks. Repair leaks and retest until no leaks exist.

B. Sleeves and sleeve seals will be considered defective if they do not pass tests and inspections.

3.4 SLEEVE AND SLEEVE-SEAL SCHEDULE

A. Use sleeves and sleeve seals for the following piping-penetration applications:

1. Exterior Concrete Walls Above Grade:

a. Piping Smaller Than NPS 6: Cast-iron sleeves.

2. Interior Partitions:

a. Piping Smaller Than NPS 6: Steel pipe sleeves.

END OF SECTION 230517

SECTION 230518 - ESCUTCHEONS FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Escutcheons.
2. Floor plates.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 ESCUTCHEONS

A. One-Piece, Cast-Brass Type: With polished, chrome-plated and rough-brass finish and setscrew fastener.

B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.

C. One-Piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.

D. Split-Casting Brass Type: With polished, chrome-plated and rough-brass finish and with concealed hinge and setscrew.

E. Split-Plate, Stamped-Steel Type: With chrome-plated finish, concealed hinge, and spring-clip fasteners.

2.2 FLOOR PLATES

A. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.

B. Split-Casting Floor Plates: Cast brass with concealed hinge.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.

B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.

1. Escutcheons for New Piping:

a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
b. Insulated Piping: One-piece, stamped-steel type.
c. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
d. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
e. Bare Piping in Unfinished Service Spaces: One-piece, cast-brass type with finish.
f. Bare Piping in Equipment Rooms: One-piece, cast-brass type with finish.

2. Escutcheons for Existing Piping:

a. Insulated Piping: Split-plate, stamped-steel type with concealed hinge.
b. Bare Piping at Wall and Floor Penetrations in Finished Spaces: Split-casting brass type with polished, chrome-plated finish.
c. Bare Piping at Ceiling Penetrations in Finished Spaces: Split-casting brass type with polished, chrome-plated finish.
d. Bare Piping in Unfinished Service Spaces: Split-casting brass type with polished, chrome-plated finish.
e. Bare Piping in Equipment Rooms: Split-casting brass type with polished, chrome-plated finish.

C. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.

1. New Piping: One-piece, floor-plate type.
2. Existing Piping: Split-casting, floor-plate type.

3.2 FIELD QUALITY CONTROL

A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION 230518

SECTION 230519 - METERS AND GAGES FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Liquid-in-glass thermometers.
2. Thermowells.
3. Test plugs.
4. Dial-type pressure gages.
5. Gage attachments.
6. Test plugs.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Certificates: For each type of meter and gage, from manufacturer.

C. Operation and Maintenance Data: For meters and gages to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 LIQUID-IN-GLASS THERMOMETERS

A. Metal-Case, Industrial-Style, Liquid-in-Glass Thermometers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Flo Fab Inc.
b. Miljoco Corporation.
c. Palmer Wahl Instrumentation Group.
d. Tel-Tru Manufacturing Company.

e. Trerice, H. O. Co.
f. Weiss Instruments, Inc.
g. Winters Instruments - U.S.

2. Standard: ASME B40.200.
3. Case: Cast aluminum; 7-inch nominal size unless otherwise indicated.
4. Case Form: Adjustable angle unless otherwise indicated.
5. Tube: Glass with magnifying lens and blue or red organic liquid.
6. Tube Background: Nonreflective aluminum with permanently etched scale markings graduated in deg F.
7. Window: Glass.
8. Stem: Aluminum and of length to suit installation.
   a. Design for Thermowell Installation: Bare stem.
9. Connector: 1-1/4 inches, with ASME B1.1 screw threads.
10. Accuracy: Plus or minus 1 percent of scale range or one scale division, to a maximum of 1.5 percent of scale range.

2.2 THERMOWELLS

A. Thermowells:

1. Standard: ASME B40.200.
2. Description: Pressure-tight, socket-type fitting made for insertion into piping tee fitting.
3. Material for Use with Copper Tubing: CNR or CUNI.
4. Material for Use with Steel Piping: CRES or CSA.
5. Type: Stepped shank unless straight or tapered shank is indicated.
6. External Threads: NPS 1/2, NPS 3/4, or NPS 1, ASME B1.20.1 pipe threads.
7. Internal Threads: 1/2, 3/4, and 1 inch, with ASME B1.1 screw threads.
8. Bore: Diameter required to match thermometer bulb or stem.
9. Insertion Length: Length required to match thermometer bulb or stem.
10. Lagging Extension: Include on thermowells for insulated piping and tubing.
11. Bushings: For converting size of thermowell's internal screw thread to size of thermometer connection.

B. Heat-Transfer Medium: Mixture of graphite and glycerin.

2.3 PRESSURE GAGES

A. Direct-Mounted, Metal-Case, Dial-Type Pressure Gages:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   a. AMETEK, Inc.; U.S. Gauge.
   b. Ashcroft Inc.

c. Ernst Flow Industries.
d. Flo Fab Inc.
e. Marsh Bellofram.
f. Miljoco Corporation.
g. Noshok.
h. Palmer Wahl Instrumentation Group.
i. REOTEMP Instrument Corporation.
j. Tel-Tru Manufacturing Company.
k. Trerice, H. O. Co.
l. Watts Regulator Co.; a div. of Watts Water Technologies, Inc.
m. Weiss Instruments, Inc.
n. Winters Instruments - U.S.

2. Standard: ASME B40.100.
3. Case: Sealed type(s); cast aluminum or drawn steel; 4-1/2-inch nominal diameter.
4. Pressure-Element Assembly: Bourdon tube unless otherwise indicated.
5. Pressure Connection: Brass, with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads and bottom-outlet type unless back-outlet type is indicated.
6. Movement: Mechanical, with link to pressure element and connection to pointer.
7. Dial: Nonreflective aluminum with permanently etched scale markings graduated in psi.
8. Pointer: Dark-colored metal.
9. Window: Glass.
10. Ring: Brass.
11. Accuracy: Grade B, plus or minus 2 percent of middle half of scale range.

2.4 GAGE ATTACHMENTS

A. Snubbers: ASME B40.100, brass; with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads and porous-metal-type surge-dampening device. Include extension for use on insulated piping.

B. Valves: Brass or stainless-steel needle, with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads.

2.5 TEST PLUGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Flow Design, Inc.
2. Peterson Equipment Co., Inc.
3. Trerice, H. O. Co.
4. Watts Regulator Co.; a div. of Watts Water Technologies, Inc.
5. Weiss Instruments, Inc.

B. Description: Test-station fitting made for insertion into piping tee fitting.

C. Body: Brass or stainless steel with core inserts and gasketed and threaded cap. Include extended stem on units to be installed in insulated piping.

D. Thread Size: NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe thread.

E. Minimum Pressure and Temperature Rating: 500 psig at 200 deg F.

F. Core Inserts: Chlorosulfonated polyethylene synthetic and EPDM self-sealing rubber.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install thermowells with socket extending to center of pipe and in vertical position in piping tees.

B. Install thermowells of sizes required to match thermometer connectors. Include bushings if required to match sizes.

C. Install thermowells with extension on insulated piping.

D. Fill thermowells with heat-transfer medium.

E. Install direct-mounted thermometers in thermowells and adjust vertical and tilted positions.

1. See drawings and schematics for thermometer locations.

F. Install test plugs in piping tees.

G. Install direct-mounted pressure gages in piping tees with pressure gage located on pipe at the most readable position.

1. See drawings and schematics for pressure gage locations.

H. Install valve and snubber in piping for each pressure gage for fluids.

I. Install connection fittings in accessible locations for attachment to portable indicators.

3.2 CONNECTIONS

A. Install meters and gages adjacent to machines and equipment to allow service and maintenance of meters, gages, machines, and equipment.

3.3 THERMOMETER SCALE-RANGE SCHEDULE

A. Scale Range for Heating, Hot-Water Piping: 30 to 240 deg F.

B. Scale Range for Chilled-Water Piping: 0 to 100 deg F.

3.4 PRESSURE-GAGE SCALE-RANGE SCHEDULE

A. Scale Range for Heating, Hot-Water Piping: 0 to 100 psi.

B. Scale Range for Chilled-Water Piping: 0 to 100 psi.

END OF SECTION 230519

SECTION 230523 - GENERAL-DUTY VALVES FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Bronze ball valves.
2. Bronze swing check valves.
3. Iron, single-flange butterfly valves.
4. Iron, grooved-end butterfly valves.
5. Bronze gate vales.
6. Iron gate valves.

B. Related Sections:

1. Division 23 HVAC piping Sections for specialty valves applicable to those Sections only.
2. Division 23 Section "Identification for HVAC Piping and Equipment" for valve tags and schedules.

1.3 DEFINITIONS

A. CWP: Cold working pressure.
B. EPDM: Ethylene propylene copolymer rubber.
C. NRS: Nonrising stem.
D. RS: Rising stem.
E. OS&Y: Outside screw and yoke.

1.4 SUBMITTALS

A. Product Data: For each type of valve indicated.

1.5 QUALITY ASSURANCE

A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.

B. ASME Compliance:

1. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:

1. Protect internal parts against rust and corrosion.
2. Protect threads, flange faces, grooves, and weld ends.
3. Set ball valves open to minimize exposure of functional surfaces.
4. Block check valves in either closed or open position.
5. Set butterfly valves closed or slightly open.

B. Use the following precautions during storage:

1. Maintain valve end protection.
2. Store valves indoors and maintain at higher than ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. American Valve, Inc.
b. Conbraco Industries, Inc.; Apollo Valves.
c. Crane Co.; Crane Valve Group; Crane Valves.
d. Hammond Valve.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

2.2 GENERAL REQUIREMENTS FOR VALVES

A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.

B. ASME Compliance:

1. ASME B16.1 for flanges on iron valves.
2. ASME B16.5 for pipe flanges and flanged fittings, NPS 1/2 through NPS 24.
3. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.

C. AWWA Compliance: Comply with AWWA C606 for grooved-end connections.

D. Refer to HVAC valve schedule articles for applications of valves.

E. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

F. Valve Sizes: Same as upstream piping unless otherwise indicated.

G. Valve Actuator Types:

1. Handwheel: For valves other than quarter-turn types.
2. Handlever: For quarter-turn valves NPS 6 and smaller.

H. Valves in Insulated Piping: With 2-inch stem extensions and the following features:

1. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.

I. Valve-End Connections:

1. Flanged: With flanges according to ASME B16.1 for iron valves.
2. Solder Joint: With sockets according to ASME B16.18.
3. Threaded: With threads according to ASME B1.20.1.

J. Valve Bypass and Drain Connections: MSS SP-45.

2.3 BRONZE BALL VALVES

A. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim:

1. Description:

a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.

d. Body Design: Two piece.
e. Body Material: Bronze.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Bronze.
i. Ball: Chrome-plated brass.
j. Port: Full.

2.4 BRONZE SWING CHECK VALVES

A. Class 125, Bronze Swing Check Valves with Bronze Disc:

1. Description:

a. Standard: MSS SP-80, Type 3.
b. CWP Rating: 200 psig.
c. Body Design: Horizontal flow.
d. Body Material: ASTM B 62, bronze.
e. Ends: Threaded.
f. Disc: Bronze.

2.5 IRON, SINGLE-FLANGE BUTTERFLY VALVES

A. Iron, Single-Flange Butterfly Valves with Aluminum-Bronze Disc:

1. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 150 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: EPDM.
f. Stem: One- or two-piece stainless steel.
g. Disc: Aluminum bronze.

B. Iron, Single-Flange Butterfly Valves with Ductile-Iron Disc:

1. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 150 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: EPDM.
f. Stem: One- or two-piece stainless steel.
g. Disc: Nickel-plated or -coated ductile iron.

2.6 DUCTILE-IRON, GROOVED-END BUTTERFLY VALVES

A. Iron, Grooved-End Butterfly Valves, 175 CWP:

1. Description:

a. Standard: MSS SP-67, Type I.
b. CWP Rating: 175 psig.
c. Body Material: Coated, ductile iron.
d. Stem: Two-piece stainless steel.
e. Disc: Coated, ductile iron.
f. Seal: EPDM.

2.7 BRONZE GATE VALVES

A. Bronze Gate Valves, NRS, Class 125:

1. Description:

a. Standard: MSS SP-80, Type 1.
b. CWP Rating: 200 psig
c. Body Material: ASTM B62, bronze with integral seat and screw-in bonnet.
d. Ends: Threaded
e. Stem: Bronze.
f. Disc: Solid wedge; bronze.
g. Packing: Asbestos free.
h. Handwheel: Malleable iron.

B. Bronze Gate Valves, RS, Class 125:

1. Description:

a. Standard: MSS SP-80, Type 2.
b. CWP Rating: 200 psig
c. Body Material: ASTM B62, bronze with integral seat and screw-in bonnet.
d. Ends: Threaded.
e. Stem: Bronze.
f. Disc: Solid wedge; bronze.
g. Packing: Asbestos free.
h. Handwheel: Malleable iron, bronze, or aluminum.

C. Bronze Gate Valves, Press Ends:

1. Description:

a. Standard: MSS SP-80.
b. CWP Rating: Minimum 200 psig.
c. Body Material: Bronze with integral seat and union-ring bonnet.
d. Ends: Press.

e. Press Ends Connection Rating: Minimum 200 psig.
f. Stem: Brass or bronze [**RS**] [**NRS**].
g. Disc: Solid wedge; bronze.
h. Packing: Graphite.
i. Port: Full.
j. Handwheel: Malleable iron, bronze, or aluminum.

2.8 IRON GATE VALVES

A. Iron Gate Valves, NRS, Class 125:

1. Description:

a. Standard: MSS SP-70, Type I.
b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. Body Material: ASTM A126, gray iron with bolted bonnet.
d. Ends: Flanged.
e. Trim: Bronze.
f. Disc: Solid wedge.
g. Packing and Gasket: Asbestos free.

B. Iron Gate Valves, OS&Y, Class 125:

1. Description:

a. Standard: MSS SP-70, Type I.
b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.
c. Body Material: ASTM A126, gray iron with bolted bonnet.
d. Ends: Flanged.
e. Trim: Bronze.
f. Disc: Solid wedge.
g. Packing and Gasket: Asbestos free.

2.9 CHAINWHEELS

A. Description: Valve actuation assembly with sprocket rim, chain guides, chain, and attachment brackets for mounting chainwheels directly to handwheels.

1. Sprocket Rim with Chain Guides: Ductile or cast iron with zinc coating, of type and size required for valve
2. Chain: Hot-dip galvanized steel, of size required to fit sprocket rim.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.

B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.

C. Examine threads on valve and mating pipe for form and cleanliness.

D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.

E. Do not attempt to repair defective valves; replace with new valves.

F. Examine press joint surfaces. Verify that they are clean and free from dents and burrs and that O-ring seals are in place and undamaged.

G. Do not attempt to repair defective valves, replace with new valves.

3.2 VALVE INSTALLATION

A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

B. Install valve tags. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for valve tags and schedules.

C. Locate valves for easy access and provide separate support where necessary.

D. Install valves in horizontal piping with stem at or above center of pipe.

E. Install valves in position to allow full stem movement.

F. Install check valves for proper direction of flow and as follows:

1. Swing Check Valves: In horizontal position with hinge pin level.

G. Verify that joints of each valve have been properly installed and sealed to ensure that there is no leakage or damage.

H. Install chainwheels on manual operators for gate valves NPS 4 and larger and more than 96 inches above floor. Extend chains to 60 inches above finished floor.

I. Adhere to manufacturer's written installation instructions. When soldering or brazing valves, do not heat valves above maximum permitted temperature. Do not use solder with melting point temperature above valve of manufacturer's recommended maximum.

3.3 ADJUSTING

A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.4 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valve applications are not indicated, use the following:

1. Shutoff Service: Ball valve, NPS 2 or smaller.
2. Shutoff Service: Gate valve, NPS 2-1/2 or larger.

B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP classes or CWP ratings may be substituted.

C. Select valves, except wafer types, with the following end connections:

1. For Copper Tubing, NPS 2 and Smaller: Threaded ends.
2. For Copper Tubing NPS 2-1/2 or larger: Flanged ends.
3. For Steel Piping NPS 2=1/2 and larger: Flanged ends.
4. For Grooved-End Coper tubing and steel piping: Valves may be grooved.

3.5 HEATING-WATER VALVE SCHEDULE

A. Pipe NPS 2 and Smaller: Bronze valves, Class 125 with soldered, threaded, or press ends.

B. Pipe NPS 2-1/2 and Larger:

1. Iron, gate valves, NRS, OS&Y, Class 125.

END OF SECTION 230523

SECTION 230529 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following hangers and supports for HVAC system piping and equipment:

1. Steel pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal Framing Systems
4. Thermal-hanger shield inserts.
5. Fastener systems.
6. Equipment supports

B. Related Sections include the following:

1. Section 233113 "Metal Ducts" for duct hangers and supports.
2. Section 230516 “Expansion Fittings and Loops for HVAC Piping” for pipe guides and anchors.

1.3 DEFINITIONS

A. MSS: Manufactures Standardization Society for The Valve and Fittings Industry Inc.

B. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.4 PERFORMANCE REQUIREMENTS

A. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.

1.5 SUBMITTALS

A. Product Data: For the following:

1. Steel pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal framing systems.

4. Thermal-hanger shield inserts.
5. Equipment supports.

PART 2 - PRODUCTS

2.1 STEEL PIPE HANGERS AND SUPPORTS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

a. AAA Technology & Specialties Co., Inc.
b. Bergen-Power Pipe Supports.
c. B-Line Systems, Inc.; a division of Cooper Industries.
d. Carpenter & Paterson, Inc.
e. Empire Industries, Inc.
f. ERICO/Michigan Hanger Co.

B. Carbon-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.
3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.

C. Copper Pipe Hangers:

1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel

2.2 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.3 METAL FRAMING SYSTEMS

A. MFMA Manufacturer Metal Framing Systems:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

a. B-Line Systems, Inc.; a division of Cooper Industries.
b. Flex-Strut, Inc.
c. G-Strut
d. Haydon Corp.
e. Powerstrut Corm.
f. Unistrut Corp.
g. Wesanco, Inc.

2. Description: Shop- or field-fabricated pipe-support assembly for supporting multiple parallel pipes.
3. Standard: MFMA-4.
4. Channels: Continuous slotted steel channel with inturned lips.
5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
7. Metallic Coating: Hot-dipped galvanized.
8. Paint Coating: Vinyl.
9. Plastic Coating: PVC.

2.4 THERMAL-HANGER SHIELD INSERTS

A. Description: 100-psig-minimum. compressive-strength insulation insert encased in sheet metal shield.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

a. Carpenter & Paterson, Inc.
b. ERICO/Michigan Hanger Co.
c. PHS Industries, Inc.
d. Pipe Shields, Inc.
e. Rilco Manufacturing Company, Inc.
f. Value Engineered Products, Inc.

B. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate or ASTM C 552, Type II cellular glass.

C. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.

D. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.

E. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.5 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

B. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.6 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.7 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

A. Horizontal-Piping Hangers and Supports: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 pounds.

B. Comply with MSS SP-69 for trapeze pipe hanger selections and applications that are not specified in piping system Sections.

C. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

3.2 HANGER AND SUPPORT INSTALLATION

A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.

B. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

C. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

D. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

E. Install lateral bracing with pipe hangers and supports to prevent swaying.

F. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping.

G. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

H. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.1 (for power piping) and ASME B31.9 (for building services piping) are not exceeded.

I. Insulated Piping: Comply with the following:

1. Attach clamps and spacers to piping.

    a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
    b. Do not exceed pipe stress limits according to ASME B31.1 for power piping and ASME B31.9 for building services piping.

2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.

    a. Option: Thermal-hanger shield inserts may be used.

3. Shield Dimensions for Pipe: Not less than the following:

    a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.

4. Insert Material: Length at least as long as protective shield.

5. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

J. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.

1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.

K. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.

L. Fastener System Installation:

1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

M. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

3.3 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.4 PAINTING

A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.5 HANGER AND SUPPORT SCHEDULE

A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.

C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.

D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

E. Use carbon-steel pipe hangers and supports metal trapeze pipe hangers and metal framing systems and attachments for general service applications.

F. Use copper-plated pipe hangers and copper attachments for copper piping and tubing.

G. Use padded hangers for piping that is subject to scratching.

H. Use thermal-hanger shield inserts for insulated piping and tubing.

I. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
2. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36, requiring clamp flexibility and up to 4 inches of insulation.
3. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 if little or no insulation is required.
4. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
5. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8.
6. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
7. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
8. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
9. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8.
10. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3.
11. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30, from two rods if longitudinal movement caused by expansion and contraction might occur.
12. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes NPS 2-1/2 to NPS 24, from single rod if horizontal movement caused by expansion and contraction might occur.
13. Complete Pipe Rolls (MSS Type 44): For support of pipes NPS 2 to NPS 42 if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
14. Pipe Roll and Plate Units (MSS Type 45): For support of pipes NPS 2 to NPS 24 if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.
15. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes NPS 2 to NPS 30 if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.

J. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.

K. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.

L. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
6. C-Clamps (MSS Type 23): For structural shapes.
7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:

    a. Light (MSS Type 31): 750 lb.
    b. Medium (MSS Type 32): 1500 lb.
    c. Heavy (MSS Type 33): 3000 lb.

13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.

M. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

N. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.

END OF SECTION 230529

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SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL-

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Equipment labels.
2. Pipe labels.
3. Duct labels.
4. Stencils.
5. Valve tags.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.
B. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.
C. Valve numbering scheme.
D. Valve Schedules: For each piping system to include in maintenance manuals.

1.4 COORDINATION

A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
B. Coordinate installation of identifying devices with locations of access panels and doors.
C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Plastic Labels for Equipment:

1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
2. Letter Color: Black.

3. Background Color: White.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
7. Fasteners: Stainless-steel rivets or self-tapping screws.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Label Content: Include equipment's Drawing designation or unique equipment number.

C. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 PIPE LABELS

A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to partially cover circumference of pipe and to attach to pipe without fasteners or adhesive.

C. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.

1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
2. Lettering Size: At least 1-1/2 inches high.

2.3 DUCT LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick, and having predrilled holes for attachment hardware.

B. Letter Color: Black.

C. Background Color: White.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.

G. Fasteners: Stainless-steel rivets or self-tapping screws.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings; also include duct size and an arrow indicating flow direction.

1. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions or as separate unit on each duct label to indicate flow direction.

2.4 STENCILS

A. Stencils for Piping:

1. Lettering Size: At least 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances.
2. Stencil Material: Aluminum.
3. Stencil and Identification Paint: Exterior, gloss, alkyd enamel in colors indicated. Paint may be in pressurized spray-can form.

B. Stencils for Ducts:

1. Lettering Size: Minimum letter height of 1-1/4 inches for viewing distances up to 15 feet and proportionately larger lettering for greater viewing distances.
2. Stencil Material: Aluminum.
3. Stencil Paint and Identification Paint: Exterior, gloss, alkyd enamel. Paint may be in pressurized spray-can form.

2.5 VALVE TAGS

A. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.

1. Tag Material: Brass, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
2. Fasteners: Brass wire-link or beaded chain; or S-hook.

B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.

1. Valve-tag schedule shall be included in operation and maintenance data. Provide schedule in document frame and location at owner's directions, or update existing valve schedule.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, and incompatible primers, paints, and encapsulants.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

B. Coordinate installation of identifying devices with locations of access panels and doors.

C. Install identifying devices before installing acoustical ceilings and similar concealment.

3.3 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment. This shall include at a minimum all air handling units, VAV Boxes, split systems and computer room HVAC systems, boilers, and pumps.

B. Locate equipment labels where accessible and visible.

3.4 PIPE LABEL INSTALLATION

A. Stenciled Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels, complying with ASME A13.1, with painted, color-coded bands or rectangles on each piping system.

1. Identification Paint: Use for contrasting background.
2. Stencil Paint: Use for pipe marking.

B. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:

1. Near each valve and control device.
2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
4. At access doors and similar access points that permit view of concealed piping.

5. Near major equipment items and other points of origination and termination.
6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.

C. Directional Flow Arrows: Arrows shall be used to indicate direction of flow in pipes, including pipes where flow is allowed in both directions

D. Pipe Label Color Schedule:

1. Heating Water Piping:
   a. Background Color: Red.
   b. Letter Color: White.

2. Chilled Water Piping:
   a. Background Color: Blue
   b. Letter Color: White

3. Refrigerant Piping:
   a. Background Color: Safety-purple
   b. Letter Color: White

3.5 DUCT LABEL INSTALLATION

A. Install plastic-laminated duct labels with permanent adhesive on air ducts in the following color codes:

1. Blue: For cold-air supply ducts.
2. Yellow: For hot-air supply ducts.
3. Green: For exhaust-, outside-, relief-, return-, and mixed-air ducts.

B. Stenciled Duct Label Option: Stenciled labels showing service and flow direction may be provided instead of plastic-laminated duct labels, at Installer's option.

C. Locate labels near points where ducts enter into and exit from concealed spaces and at maximum intervals of 50 feet in each space where ducts are exposed or concealed by removable ceiling system.

3.6 VALVE-TAG INSTALLATION

A. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; shutoff valves; faucets; convenience and lawn-watering hose connections; and HVAC terminal devices and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.

B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:

1. Valve-Tag Size and Shape: Round.
2. Valve-Tag Color: Natural.
3. Letter Color: Engraved.

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SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Balancing Air Systems:

    a. Constant-volume air systems.

2. Balancing Hydronic Piping Systems:

    a. Constant-flow hydronic systems.

3. Unit Ventilator Exhaust Air Systems

4. Testing, Adjusting, and Balancing Equipment:

    a. Heat exchangers.
    b. Motors.
    c. Pumps.
    d. Air Handlers.
    e. Exhaust Fans.
    f. Heat Transfer Coils.

5. Testing, adjusting, and balancing systems and equipment.

    a. Control system verification.

1.3 DEFINITIONS

A. AABC: Associated Air Balance Council.

B. NEBB: National Environmental Balancing Bureau.

C. TAB: Testing, adjusting, and balancing.

D. TABB: Testing, Adjusting, and Balancing Bureau.

E. TAB Specialist: An entity engaged to perform TAB Work.

1.4 SUBMITTALS

A. Qualification Data: Within 30 days of Contractor's Notice to Proceed, submit documentation that the TAB contractor and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.

C. Certified TAB reports.

D. Sample report forms.

E. Instrument calibration reports, to include the following:

1. Instrument type and make.
2. Serial number.
3. Application.
4. Dates of use.
5. Dates of calibration.

1.5 QUALITY ASSURANCE

A. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 7.2.2 - "Air Balancing."

B. ASHRAE/IESNA 90.1-2004 Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6.7.2.3 - "System Balancing."

C. TAB Contractor Qualifications: Engage a TAB entity certified by AABC, NEBB or TABB.

1. TAB Field Supervisor: Employee of the TAB contractor and certified by AABC, NEBB or TABB.
2. TAB Technician: Employee of the TAB contractor and who is certified by AABC, NEBB or TABB as a TAB technician.

D. Certify TAB field data reports and perform the following:

1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.

E. TAB Report Forms: Use standard TAB contractor's forms approved by Architect.

F. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

1.6 PROJECT CONDITIONS

A. Partial Owner Occupancy: Owner may occupy completed areas of building before Substantial Completion. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.

1.7 COORDINATION

A. Notice: Provide seven days' advance notice for each test. Include scheduled test dates and times.

B. Perform TAB after leakage and pressure tests on air distribution systems have been satisfactorily completed.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.

B. Examine systems for installed balancing devices, such as manual volume dampers. Verify that locations of these balancing devices are accessible.

C. Examine the approved submittals for HVAC systems and equipment.

D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.

E. Examine equipment performance data including fan and pump curves.

1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use

tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.

F. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.

G. Examine test reports specified in individual system and equipment Sections.

H. Examine operating safety interlocks and controls on HVAC equipment.

I. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

A. Prepare a TAB plan that includes strategies and step-by-step procedures. Note balancing notes on the control drawings, floor plans, equipment schedules and equipment installation details.

1. Airside:

a. Verify that leakage and pressure tests on air distribution systems have been satisfactorily completed.
b. Duct systems are complete with terminals installed.
c. Volume, smoke, and fire dampers are open and functional.
d. Clean filters are installed.
e. Fans are operating, free of vibration, and rotating in correct direction.
f. Variable-frequency controllers' startup is complete and safeties are verified.
g. Automatic temperature-control systems are operational.
h. Ceilings are installed.
i. Windows and doors are installed.
j. Suitable access to balancing devices and equipment is provided.

2. Hydronics:

a. Verify leakage and pressure tests on water distribution systems have been satisfactorily completed.
b. Piping is complete with terminals installed.
c. Water treatment is complete.
d. Systems are flushed, filled, and air purged.
e. Strainers are pulled and cleaned.
f. Control valves are functioning per the sequence of operation.
g. Shutoff and balance valves have been verified to be 100 percent open.
h. Pumps are started and proper rotation is verified.
i. Pump gage connections are installed directly at pump inlet and outlet flanges or in discharge and suction pipe prior to valves or strainers.

j. Variable-frequency controllers' startup is complete and safeties are verified.
k. Suitable access to balancing devices and equipment is provided.

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance", ASHRAE 111, NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems", or SMACNA's "HVAC Systems - Testing, Adjusting, and Balancing" and in this Section.

1. Comply with requirements in ASHRAE 62.1-2004, Section 7.2.2,"Air Balancing."

B. Cut insulation, ducts, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.

1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
2. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Division 23 Section "HVAC Insulation."

C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.

D. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.

E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

F. Verify that motor starters are equipped with properly sized thermal protection.

G. Check dampers for proper position to achieve desired airflow path.

H. Check for airflow blockages.

I. Check for proper sealing of air-handling-unit components.

J. Check condensate drains for proper connections and functioning.

K. Verify that air duct system is sealed as specified in Division 23 Section "Metal Ducts."

3.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.

1. Measure total airflow.

a. Where sufficient space in ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow.

2. Measure fan static pressures as follows to determine actual static pressure:

a. Measure outlet static pressure as far downstream from the fan as practical and upstream from restrictions in ducts such as elbows and transitions.
b. Measure static pressure directly at the fan outlet or through the flexible connection.
c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from the flexible connection, and downstream from duct restrictions.
d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.

3. Measure static pressure across each component that makes up an air-handling unit.

a. Report the cleanliness status of filters and the time static pressures are measured.

4. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.

5. Obtain approval from Architect for adjustment of fan speed higher or lower than indicated speed. Comply with requirements in Division 23 Sections for air-handling units for adjustment of fans, belts, and pulley sizes to achieve indicated air-handling-unit performance.

6. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers

and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.

B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows within specified tolerances.

1. Measure airflow of submain and branch ducts.

a. Where sufficient space in submain and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.

2. Measure static pressure at a point downstream from the balancing damper, and adjust volume dampers until the proper static pressure is achieved.
3. Re-measure each submain and branch duct after all have been adjusted. Continue to adjust submain and branch ducts to indicated airflows within specified tolerances.

C. Measure air outlets and inlets without making adjustments.

1. Measure terminal outlets using a direct-reading hood or outlet manufacturer's written instructions and calculating factors.

D. Adjust air outlets and inlets for each space to indicated airflows within specified tolerances of indicated values. Make adjustments using branch volume dampers rather than extractors and the dampers at air terminals.

1. Adjust each outlet in same room or space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.
2. Adjust patterns of adjustable outlets for proper distribution without drafts.

3.6 GENERAL PROCEDURES FOR HYDRONIC SYSTEMS

A. Prepare test reports for coils. Obtain approved submittals and manufacturer-recommended testing procedures. Prepare schematic diagrams of systems' "as-built" piping layouts.

B. In addition to requirements in "Preparation" Article, prepare hydronic systems for testing and balancing as follows:

1. Check flow-control valves for proper position.
2. Check that air has been purged from the system.

3.7 PROCEDURES FOR CONSTANT-FLOW HYDRONIC SYSTEMS

A. Verify that pumps are delivering design gpm.

B. Adjust flow-measuring devices installed at terminals for each space to design water flows.

1. Measure flow at terminals.
2. Adjust each terminal to design flow.
3. Re-measure each terminal after it is adjusted.
4. Perform temperature tests after flows have been balanced.

C. For systems with pressure-independent valves at terminals:

1. Measure differential pressure and verify that it is within manufacturer's specified range.
2. Perform temperature tests after flows have been verified.

D. For systems without pressure-independent valves or flow-measuring devices at terminals:

1. Measure and balance coils by either coil pressure drop or temperature method.
2. If balanced by coil pressure drop, perform temperature tests after flows have been verified.

E. Verify that memory stops have been set.

3.8 PROCEDURES FOR MOTORS

A. Motors 1/2 HP and Larger: Test at final balanced conditions and record the following data:

1. Manufacturer's name, model number, and serial number.
2. Motor horsepower rating.
3. Motor rpm.
4. Phase and hertz.
5. Nameplate and measured voltage, each phase.
6. Nameplate and measured amperage, each phase.
7. Starter size and thermal-protection-element rating.
8. Service factor and frame size.

B. Motors Driven by Variable-Frequency Controllers: Test manual bypass of controller to prove proper operation.

3.9 PROCEDURES FOR HEAT-TRANSFER COILS

A. Measure, adjust, and record the following data for each water coil:

1. Entering- and leaving-water temperature.
2. Water flow rate.
3. Water pressure drop.
4. Dry-bulb temperature of entering and leaving air.
5. Wet-bulb temperature of entering and leaving air for cooling coils.
6. Airflow.
7. Air pressure drop.

3.10 PROCEDURES FOR UNIT VENTILATORS

A. Measure, adjust, and record the following data for each water coil:

1. Entering- and leaving-water temperature.
2. Water flow rate.
3. Water pressure drop.
4. Dry-bulb temperature of entering and leaving air.
5. Wet-bulb temperature of entering and leaving air for cooling coils.
6. Airflow.

B. Measure, adjust, and record the following data for outside air damper:

1. Scheduled minimum outside air damper position based on outside air and mixed air temperature readings.

3.11 TOLERANCES

A. Set HVAC system's air flow rates within the following tolerances:

1. Supply Fans and Equipment with Fans: Plus 10 percent or minus 5 percent.
2. Air Outlets and Inlets: Plus or minus 10 percent.
3. Heating and Cooling Water Flow Rate: Plus or minus 10 percent.

3.12 CONTROLS VERIFICATION

A. In conjunction with system balancing, perform the following:

1. Verify temperature control system is operating within the design limitations.
2. Confirm that the sequences of operation are in compliance with Contract Documents.
3. Verify that controllers are calibrated and function as intended.
4. Verify that controller set points are as indicated.
5. Verify the operation of lockout or interlock systems.
6. Verify the operation of valve and damper actuators.
7. Verify that controlled devices are properly installed and connected to correct controller.

8. Verify that controlled devices travel freely and are in position indicated by controller: open, closed, or modulating.
9. Verify location and installation of sensors to ensure that they sense only intended temperature, humidity, or pressure.

B. Reporting: Include a summary of verifications performed, remaining deficiencies, and variations from indicated conditions.

3.13 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

B. Status Reports: Prepare biweekly progress reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.14 FINAL REPORT

A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.

1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
2. Include a list of instruments used for procedures, along with proof of calibration.

B. Final Report Contents: In addition to certified field-report data, include the following:

1. Manufacturers' test data.
2. Field test reports prepared by system and equipment installers.
3. Other information relative to equipment performance; do not include Shop Drawings and product data.

C. General Report Data: In addition to form titles and entries, include the following data:

1. Title page.
2. Name and address of the TAB contractor.
3. Project name.
4. Project location.
5. Architect's name and address.
6. Engineer's name and address.
7. Contractor's name and address.

8. Report date.
9. Signature of TAB supervisor who certifies the report.
10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
11. Summary of contents including the following:

    a. Indicated versus final performance.
    b. Notable characteristics of systems.
    c. Description of system operation sequence if it varies from the Contract Documents.

12. Nomenclature sheets for each item of equipment.
13. Data for terminal units, including manufacturer's name, type, size, and fittings.
14. Notes to explain why certain final data in the body of reports vary from indicated values.
15. Test conditions for fans and pump performance forms including the following:

    a. Settings for outdoor-, return-, and exhaust-air dampers.
    b. Conditions of filters.
    c. Other system operating conditions that affect performance.

D. System Diagrams: Include schematic layouts of air distribution systems. Present each system with single-line diagram and include the following:

1. Quantities of outdoor, supply, return, and exhaust airflows.
2. Duct, outlet, and inlet sizes.
3. Water flow rates.
4. Pipe and valve sizes and locations.
5. Position of balancing devices.
6.

E. Air-Handling-Unit Test Reports: For air-handling units with coils, include the following:

1. Unit Data:

    a. Unit identification.
    b. Location.
    c. Make and type.
    d. Model number and unit size.
    e. Manufacturer's serial number.
    f. Unit arrangement and class.
    g. Discharge arrangement.
    h. Number, type, and size of filters.

2. Motor Data:

    a. Horsepower and rpm.
    b. Volts, phase, and hertz.
    c. Full-load amperage and service factor.

3. Test Data (Indicated and Actual Values):

    a. Total air flow rate in cfm.
    b. Total system static pressure in inches wg.
    c. Discharge static pressure in inches wg.
    d. Filter static-pressure differential in inches wg.
    e. Outdoor airflow in cfm.
    f. Return airflow in cfm.
    g. Outside air damper position.
    h. Return air damper position.
    i. Pre-heat coil static pressure differential in inches w.g.
    j. Cooling coil static pressure differential in inches w.g.
    k. Heating coil static pressure differential in inches w.g.

F. Air-Terminal-Device Reports:

1. Unit Data:

    a. System and air-handling unit identification.
    b. Location and zone.
    c. Apparatus used for test.
    d. Area served.
    e. Make.
    f. Number from system diagram.
    g. Type and model number.
    h. Size.
    i. Effective area in sq. ft..

2. Test Data (Indicated and Actual Values):

    a. Air flow rate in cfm.
    b. Air velocity in fpm.
    c. Preliminary air flow rate as needed in cfm.
    d. Preliminary velocity as needed in fpm.
    e. Final air flow rate in cfm.
    f. Final velocity in fpm.
    g. Space temperature in deg F.

3. Coil Data:

    a. System identification.
    b. Location.
    c. Coil type.
    d. Number of rows.
    e. Fin spacing in fins per inch o.c.
    f. Make and model number.
    g. Face area in sq. ft..
    h. Tube size in NPS.
    i. Tube and fin materials.

j. Circuiting arrangement.

4. Test Data (Indicated and Actual Values):

a. Airflow rate in cfm.
b. Average face velocity in fpm.
c. Air pressure drop in inches wg.
d. Outdoor-air, wet- and dry-bulb temperatures in deg F.
e. Return-air, wet- and dry-bulb temperatures in deg F.
f. Entering-air, wet- and dry-bulb temperatures in deg F.
g. Leaving-air, wet- and dry-bulb temperatures in deg F.
h. Water flow rate in gpm.
i. Water pressure differential in feet of head or psig.
j. Entering-water temperature in deg F.
k. Leaving-water temperature in deg F.
l. Refrigerant expansion valve and refrigerant types.
m. Refrigerant suction pressure in psig.
n. Refrigerant suction temperature in deg F.
o. Inlet steam pressure in psig.

G. Exhaust fans, include the following:

1. Fan Data:

a. System identification.
b. Location.
c. Make and type.
d. Model number and size.

2. Motor Data:

a. Motor make and size.
b. Volts, phase, and hertz.

3. Test Data (Indicated and Actual Values):

a. Total airflow rate in cfm.

H. Round and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:

1. Report Data:

a. System and air-handling-unit number.
b. Location and zone.
c. Traverse air temperature in deg F.
d. Duct static pressure in inches wg.
e. Duct size in inches.
f. Duct area in sq. ft..

g. Indicated airflow rate in cfm.
h. Indicated velocity in fpm.
i. Actual airflow rate in cfm.
j. Actual average velocity in fpm.
k. Barometric pressure in psig.

I. Pump Test Reports: Calculate impeller size by plotting the shutoff head on pump curves and include the following:

1. Unit Data:

a. Unit identification.
b. Location.
c. Service.
d. Make and size.
e. Model number and serial number.
f. Water flow rate in gpm.
g. Water pressure differential in feet of head or psig.
h. Required net positive suction head in feet of head or psig.
i. Pump rpm.
j. Impeller diameter in inches.
k. Motor make and frame size.
l. Motor horsepower and rpm.
m. Voltage at each connection.
n. Amperage for each phase.
o. Full-load amperage and service factor.
p. Seal type.

2. Test Data (Indicated and Actual Values):

a. Static head in feet of head or psig.
b. Pump shutoff pressure in feet of head or psig.
c. Actual impeller size in inches.
d. Full-open flow rate in gpm.
e. Full-open pressure in feet of head or psig.
f. Final discharge pressure in feet of head or psig.
g. Final suction pressure in feet of head or psig.
h. Final total pressure in feet of head or psig.
i. Final water flow rate in gpm.
j. Voltage at each connection.
k. Amperage for each phase.

J. Instrument Calibration Reports:

1. Report Data:

a. Instrument type and make.
b. Serial number.
c. Application.

d. Dates of use.
e. Dates of calibration.

3.15 INSPECTIONS

A. Initial Inspection:

1. After testing and balancing are complete, operate each system and randomly check measurements to verify that the system is operating according to the final test and balance readings documented in the final report.
2. Check the following for each system:

a. Measure airflow of at least 10 percent of air outlets.
b. Measure room temperature at each thermostat/temperature sensor. Compare the reading to the set point.
c. Verify that balancing devices are marked with final balance position.
d. Note deviations from the Contract Documents in the final report.

B. Final Inspection:

1. After initial inspection is complete and documentation by random checks verifies that testing and balancing are complete and accurately documented in the final report, request that a final inspection be made by Architect.
2. The TAB contractor's test and balance engineer shall conduct the inspection in the presence of Architect.

C. TAB Work will be considered defective if it does not pass final inspections. If TAB Work fails, proceed as follows:

1. Recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes; resubmit the final report and request a second final inspection.
2. If the second final inspection also fails, Owner may contract the services of another TAB contractor to complete TAB Work according to the Contract Documents and deduct the cost of the services from the original TAB contractor's final payment.

D. Prepare test and inspection reports.

3.16 ADDITIONAL TESTS

A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions.

END OF SECTION 230593

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SECTION 230700 - HVAC INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Insulation Materials:
   a. Mineral fiber.
2. Adhesives.
3. Mastics.
4. Lagging adhesives.
5. Sealants.
6. Factory-applied jackets.
7. Field-applied jackets.
8. Tapes.
9. Securements.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include thermal conductivity, thickness, and jackets (both factory and field applied, if any).

B. Shop Drawings:

1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
2. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
3. Detail removable insulation at piping specialties, equipment connections, and access panels.
4. Detail application of field-applied jackets.
5. Detail application at linkages of control devices.

C. Qualification Data: For qualified Installer.

D. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of

insulation materials, sealers, attachments, and jackets, with requirements indicated. Include dates of tests and test methods employed.

E. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.

B. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, and tapes, with appropriate markings of applicable testing and inspecting agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.6 COORDINATION

A. Coordinate size and location of supports, hangers, and insulation shields specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment."

B. Coordinate clearance requirements with piping Installer for piping insulation. Before preparing piping Shop Drawings establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.7 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in Part 3 schedule articles for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

D. Flexible Elastomeric: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials and Type II for sheet materials.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Aeroflex USA Inc.; Aerocel.
b. Armacell LLC; AP Armaflex.
c. RBX Corporation; Insul-Sheet 1800 and Insul-Tube 180.

E. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type III with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. CertainTeed Corp.; Duct Wrap.
b. Johns Manville; Microlite.
c. Knauf Insulation; Duct Wrap.
d. Manson Insulation Inc.; Alley Wrap.
e. Owens Corning; All-Service Duct Wrap.

F. Mineral-Fiber Board Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type IA or Type IB. For duct and plenum applications, provide insulation with factory-applied FSK jacket. For equipment applications, provide insulation with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. CertainTeed Corp.; Commercial Board.
b. Fibrex Insulations Inc.; FBX.
c. Johns Manville; 800 Series Spin-Glas.
d. Knauf Insulation; Insulation Board.

e. Manson Insulation Inc.; AK Board.
f. Owens Corning; Fiberglas 700 Series.

G. Mineral-Fiber, Preformed Pipe Insulation:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Fibrex Insulations Inc.; Coreplus 1200.
b. Johns Manville; Micro-Lok.
c. Knauf Insulation; 1000 Pipe Insulation.
d. Manson Insulation Inc.; Alley-K.
e. Owens Corning; Fiberglas Pipe Insulation.

2. Type I, 850 deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ-SSL. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

2.2 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

B. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.

1. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Aeroflex USA Inc.; Aeroseal.
b. Armacell LCC; 520 Adhesive.
c. Foster Products Corporation, H. B. Fuller Company; 85-75.
d. RBX Corporation; Rubatex Contact Adhesive.

C. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

1. For indoor applications, use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products, Division of ITW; CP-82.
b. Foster Products Corporation, H. B. Fuller Company; 85-20.
c. ITW TACC, Division of Illinois Tool Works; S-90/80.

d. Marathon Industries, Inc.; 225.
e. Mon-Eco Industries, Inc.; 22-25.

D. ASJ Adhesive, and FSK and PVDC Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

1. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products, Division of ITW; CP-82.
b. Foster Products Corporation, H. B. Fuller Company; 85-20.
c. Marathon Industries, Inc.; 225.
d. Mon-Eco Industries, Inc.; 22-25.

E. PVC Jacket Adhesive: Compatible with PVC jacket.

1. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Dow Chemical Company (The); 739, Dow Silicone.
b. Johns-Manville; Zeston Perma-Weld, CEEL-TITE Solvent Welding Adhesive.
c. P.I.C. Plastics, Inc.; Welding Adhesive.
d. Speedline Corporation; Speedline Vinyl Adhesive.

2.3 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-C-19565C, Type II.

1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Vapor-Barrier Mastic: Water based; suitable for indoor and outdoor use on below ambient services.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products, Division of ITW; CP-35.
b. Foster Products Corporation, H. B. Fuller Company; 30-90.
c. ITW TACC, Division of Illinois Tool Works; CB-50.
d. Marathon Industries, Inc.; 590.

e. Mon-Eco Industries, Inc.; 55-40.
f. Vimasco Corporation; 749.

2. Water-Vapor Permeance: ASTM E 96, Procedure B, 0.013 perm at 43-mil dry film thickness.
3. Service Temperature Range: Minus 20 to plus 180 deg F.
4. Solids Content: ASTM D 1644, 59 percent by volume and 71 percent by weight.
5. Color: White.

C. Breather Mastic: Water based; suitable for indoor and outdoor use on above ambient services.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products, Division of ITW; CP-10.
b. Foster Products Corporation, H. B. Fuller Company; 35-00.
c. ITW TACC, Division of Illinois Tool Works; CB-05/15.
d. Marathon Industries, Inc.; 550.
e. Mon-Eco Industries, Inc.; 55-50.
f. Vimasco Corporation; WC-1/WC-5.

2. Water-Vapor Permeance: ASTM F 1249, 3 perms at 0.0625-inch dry film thickness.
3. Service Temperature Range: Minus 20 to plus 200 deg F.
4. Solids Content: 63 percent by volume and 73 percent by weight.
5. Color: White.

2.4 LAGGING ADHESIVES

A. Description: Comply with MIL-A-3316C Class I, Grade A and shall be compatible with insulation materials, jackets, and substrates.

1. For indoor applications, use lagging adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products, Division of ITW; CP-52.
b. Foster Products Corporation, H. B. Fuller Company; 81-42.
c. Marathon Industries, Inc.; 130.
d. Mon-Eco Industries, Inc.; 11-30.
e. Vimasco Corporation; 136.

3. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over equipment, and pipe insulation.
4. Service Temperature Range: Minus 50 to plus 180 deg F.

5. Color: White.

2.5 SEALANTS

A. FSK and Metal Jacket Flashing Sealants:

1. For indoor applications, use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products, Division of ITW; CP-76-8.
b. Foster Products Corporation, H. B. Fuller Company; 95-44.
c. Marathon Industries, Inc.; 405.
d. Mon-Eco Industries, Inc.; 44-05.
e. Vimasco Corporation; 750.

3. Materials shall be compatible with insulation materials, jackets, and substrates.
4. Fire- and water-resistant, flexible, elastomeric sealant.
5. Service Temperature Range: Minus 40 to plus 250 deg F.
6. Color: Aluminum.
7. For indoor applications, use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. For indoor applications, use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products, Division of ITW; CP-76.

3. Materials shall be compatible with insulation materials, jackets, and substrates.
4. Fire- and water-resistant, flexible, elastomeric sealant.
5. Service Temperature Range: Minus 40 to plus 250 deg F.
6. Color: White.
7. For indoor applications, use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.6 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
2. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

2.7 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.

B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Johns Manville; Zeston.
b. P.I.C. Plastics, Inc.; FG Series.
c. Proto PVC Corporation; LoSmoke.
d. Speedline Corporation; SmokeSafe.

2. Adhesive: As recommended by jacket material manufacturer.
3. Color: White.
4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.

a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

5. Factory-fabricated tank heads and tank side panels.

2.8 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0835.
b. Compac Corp.; 104 and 105.
c. Ideal Tape Co., Inc., an American Biltrite Company; 428 AWF ASJ.
d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.

2. Width: 3 inches.
3. Thickness: 11.5 mils.

4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0827.
   b. Compac Corp.; 110 and 111.
   c. Ideal Tape Co., Inc., an American Biltrite Company; 491 AWF FSK.
   d. Venture Tape; 1525 CW, 1528 CW, and 1528 CW/SQ.

2. Width: 3 inches.
3. Thickness: 6.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

2.9 SECUREMENTS

A. Bands:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. Childers Products; Bands.
   b. PABCO Metals Corporation; Bands.
   c. RPR Products, Inc.; Bands.

2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304 or Type 316; 0.015 inch thick, 1/2 inch wide with wing or closed seal.

B. Insulation Pins and Hangers:

1. Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.106-inch-diameter shank, length to suit depth of insulation indicated.

   a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

      1) AGM Industries, Inc.; CWP-1.
      2) GEMCO; CD.

3) Midwest Fasteners, Inc.; CD.
4) Nelson Stud Welding; TPA, TPC, and TPS.

2. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.106-inch-diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.

   a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

      1) AGM Industries, Inc.; CWP-1.
      2) GEMCO; Cupped Head Weld Pin.
      3) Midwest Fasteners, Inc.; Cupped Head.
      4) Nelson Stud Welding; CHP.

3. Metal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:

   a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

      1) AGM Industries, Inc.; Tactoo Insul-Hangers, Series T.
      2) GEMCO; Perforated Base.
      3) Midwest Fasteners, Inc.; Spindle.

   b. Baseplate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
   c. Spindle: Copper- or zinc-coated, low carbon steel, fully annealed, 0.106-inch-diameter shank, length to suit depth of insulation indicated.
   d. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.

4. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick, galvanized-steel sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

   a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

      1) AGM Industries, Inc.; RC-150.
      2) GEMCO; R-150.
      3) Midwest Fasteners, Inc.; WA-150.

4) Nelson Stud Welding; Speed Clips.

b. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in exposed locations.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.

1. Verify that systems and equipment to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install in accordance with the Energy Conservation Code of New York State.

B. Install in accordance with the Mechanical Code of New York State.

C. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment and piping including fittings, valves, and specialties.

D. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment and pipe system as specified in insulation system schedules.

E. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

F. Install insulation with longitudinal seams at top and bottom of horizontal runs.

G. Install multiple layers of insulation with longitudinal and end seams staggered.

H. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

I. Keep insulation materials dry during application and finishing.

J. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

K. Install insulation with least number of joints practical.

L. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.

1. Install insulation continuously through hangers and around anchor attachments.

2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.

3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.

4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

M. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

N. Install insulation with factory-applied jackets as follows:

1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.

3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.

   a. For below ambient services, apply vapor-barrier mastic over staples.

4. Cover joints and seams with tape as recommended by insulation material manufacturer to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.

O. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

P. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

Q. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

R. For above ambient services, do not install insulation to the following:

1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.

3.4 PENETRATIONS

A. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

B. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions. Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations.

1. Comply with requirements in Division 07 Section "Penetration Firestopping" for firesopping and fire-resistive joint sealers.

3.5 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:

1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity, unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
3. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap

adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts.

4. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
5. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
6. Stencil or label the outside insulation jacket of each union with the word "UNION." Match size and color of pipe labels.

3.6 MINERAL-FIBER INSULATION INSTALLATION

A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.

1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of duct and plenum surfaces.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:

    a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
    b. On duct sides with dimensions larger than 18 inches, place pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
    c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
    d. Do not overcompress insulation during installation.
    e. Impale insulation over pins and attach speed washers.
    f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.

4. For ducts with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from 1 edge and 1 end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.

a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
b. Install vapor stops for ductwork operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to 2 times the insulation thickness but not less than 3 inches.

5. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches o.c.
6. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
7. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

B. Board Insulation Installation on Ducts: Secure with adhesive and insulation pins.

1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of duct and plenum surfaces.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:

a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
b. On duct sides with dimensions larger than 18 inches, space pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
d. Do not over-compress insulation during installation.
e. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.

4. For ducts with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from 1 edge and 1 end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.

a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to 2 times the insulation thickness but not less than 3 inches.

Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Groove and score insulation to fit as closely as possible to outside and inside radius of elbows. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.

5. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

3.7 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Inspect field-insulated equipment, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to one location(s) for each type of equipment defined in the "Equipment Insulation Schedule" Article. For large equipment, remove only a portion adequate to determine compliance.

2. Inspect pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of threaded fittings, three locations of welded fittings, two locations of threaded strainers, two locations of welded strainers, three locations of threaded valves, and three locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.

C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.8 DUCT INSULATION SCHEDULE, GENERAL

A. Ducts Requiring Insulation:

1. Indoor, concealed supply and outdoor air.
2. Indoor, exposed supply and outdoor air.
3. Indoor, exposed return located in nonconditioned space.

4. Indoor, concealed exhaust between isolation damper and penetration of building exterior or 10’-0” of horizontal duct main from building envelope penetration whichever is greater.

B. Items Not Insulated:

1. Factory-insulated flexible ducts.
2. Factory-insulated plenums and casings.
3. Flexible connectors.
4. Vibration-control devices.
5. Factory-insulated access panels and doors.

3.9 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range.

B. Piping insulation thicknesses scheduled below are based on insulation having a conductivity k not exceeding 0.27 btu per inch / (hr) (ft2) (deg F).

3.10 PIPING INSULATION SCHEDULE

A. Heating-Hot-Water and Glycol Supply and Return, 200 Deg F and below:

1. All pipe sizes up to NPS 12”: Insulation shall be the following:

a. Mineral-Fiber preformed or Flexible Elastomeric: 1-1/2 inch thick.

B. Condensate Drain Piping and Tubing Insulation and Jacket Requirements:

1. Flexible Elastomeric Insulation:

a. Closed-cell, sponge- or expanded-rubber materials, complying with ASTM C534, Type I for tubular materials.
b. Indoors: 1 inch thick.
c. Outdoors: 1 inch thick.

2. Field-Applied Jacket:

a. Concealed: None required.
b. Indoors, Exposed to View: PVC, 20 mils thick.
c. Outdoors, Exposed to View: Aluminum, smooth, 0.020 inch thick.

C. Refrigerant Tubing Insulation and Jacket Requirements:

1. Flexible Elastomeric Insulation:

a. Closed-cell, sponge- or expanded-rubber materials, complying with ASTM C534, Type I for tubular materials.
b. Indoors: 1 inch thick.
c. Outdoors: 1 inch thick.

2. Field-Applied Jacket:

a. Concealed: None required.
b. Indoors, Exposed to View: PVC, 20 mils thick.
c. Outdoors, Exposed to View: Aluminum, smooth, 0.020 inch thick.

END OF SECTION 230700

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SECTION 230800 –COMMISSIONING OF HVAC

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 SUMMARY

A. Section includes commissioning process requirements for the following HVAC&R systems, assemblies, and equipment:

1. Hot water boilers.
2. Heat exchangers.
3. Circulating pumps.
4. Unit ventilators.
5. Unit ventilator relief and exhaust air paths.
6. Rooftop heating and cooling air handlers.
7. Controls and instrumentation, including BAS.
8. Systems testing and balancing verification, including heating-water piping systems.
9. Systems testing and balancing verification, including heating-water piping systems supply-air systems return-air systems.
10. Automatic lighting controls including occupancy sensors, time-switch controls, and daylight responsive controls.

1.3 DEFINITIONS

A. BAS: Building automation system.
B. DDC: Direct digital controls.
C. CxA: Commissioning Authority.
D. HVAC&R: Heating, Ventilating, Air Conditioning, and Refrigeration.
E. "Systems," "Subsystems," "Equipment," and "Components": Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, equipment, and components.
F. TAB: Testing, adjusting, and balancing.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For BAS and HVAC&R Testing Technician.

B. Construction Checklists: See related Sections for technical requirements for the following construction checklists:

1. Vibration and seismic controls for HVAC&R piping and equipment.
2. Instrumentation and control for HVAC&R.
3. Heating water and glycol piping and accessories.
4. Pumps.
5. Heat exchangers.
6. Refrigerant piping.
7. Fans
8. Terminal units.
9. Roof top air handling units.
10. Unit ventilators.

1.5 QUALITY ASSURANCE

A. BAS Testing Technician Qualifications: Technicians to perform BAS construction checklist verification tests, construction checklist verification test demonstrations, commissioning tests, and commissioning test demonstrations shall have the following minimum qualifications:

1. Journey-level or equivalent skill level with knowledge of BAS, HVAC&R, electrical concepts, and building operations.
2. Minimum three years' experience installing, servicing, and operating systems manufactured by approved manufacturer.
3. International Society of Automation (ISA) Certified Control Systems Technician (CCST) Level I.

B. HVAC&R Testing Technician Qualifications: Technicians to perform HVAC&R construction checklist verification tests, construction checklist verification test demonstrations, commissioning tests, and commissioning test demonstrations shall have the following minimum qualifications:

1. Journey-level or equivalent skill level. Vocational School four-year program graduate or an Associate’s degree in mechanical systems, air conditioning, or similar field. Degree may be offset by three years' experience in servicing mechanical systems in the HVAC industry. Generally, required knowledge includes HVAC&R systems, electrical concepts, building operations, and application and use of tools and instrumentation to measure performance of HVAC&R equipment, assemblies, and systems.
2. Minimum three years' experience installing, servicing, and operating systems manufactured by approved manufacturer.
3. One of the following:

    a. National Environmental Balancing Bureau (NEBB) Certified Testing, Adjusting, and Balancing Technician.
    b. Associated Air Balance Council (AABC) Certified Test and Balance Technician.
    c. Owner retains the right to waive NEBB or AABC Certification.

C. Testing Equipment and Instrumentation Quality and Calibration: For test equipment and instrumentation required to perform HVAC&R commissioning work, perform the following:

1. Submit test equipment and instrumentation list. For each equipment or instrument, identify the following:

   a. Equipment/instrument identification number.
   b. Planned commissioning application or use.
   c. Manufacturer, make, model, and serial number.
   d. Calibration history, including certificates from agencies that calibrate the equipment and instrumentation.

2. Test equipment and instrumentation shall meet the following criteria:

   a. Capable of testing and measuring performance within the specified acceptance criteria.
   b. Be calibrated at the manufacturer's recommended intervals with current calibration tags permanently affixed to the instrument being used.
   c. Be maintained in good repair and operating condition throughout the duration of use on this Project.
   d. Be recalibrated/repaired if dropped or damaged in any way since last calibrated.

D. Proprietary Test Instrumentation and Tools:

1. Equipment Manufacturer's Proprietary Instrumentation and Tools: For installed equipment included in the commissioning process, test instrumentation and tools manufactured or prescribed by equipment manufacturer to service, calibrate, adjust, repair, or otherwise work on its equipment or required as a condition of equipment warranty, perform the following:

   a. Submit proprietary instrumentation and tools list. For each instrument or tool, identify the following:

      1) Instrument or tool identification number.
      2) Equipment schedule designation of equipment for which the instrument or tool is required.
      3) Manufacturer, make, model, and serial number.
      4) Calibration history, including certificates from agencies that calibrate the instrument or tool, where appropriate.

   b. Include a separate list of proprietary test instrumentation and tools in the operation and maintenance manuals.
   c. HVAC&R proprietary test instrumentation and tools become the property of Owner at the time of Substantial Completion.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 GENERAL COMMISSIONING REQUIREMENTS

A. Certify that HVAC&R systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents and approved Shop Drawings and submittals.

B. Certify that HVAC&R instrumentation and control systems have been completed and calibrated, that they are operating according to the Contract Documents and approved Shop Drawings and submittals, and that pretest set points have been recorded.

C. Certify that TAB procedures have been completed and that TAB reports have been submitted, discrepancies corrected, and corrective work approved.

D. Set systems, subsystems, and equipment into operating mode to be tested according to approved test procedures (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).

E. Measure capacities and effectiveness of systems, assemblies, subsystems, equipment, and components, including operational and control functions to verify compliance with acceptance criteria.

F. Test systems, assemblies, subsystems, equipment, and components operating modes, interlocks, control responses, and responses to abnormal or emergency conditions, and response according to acceptance criteria.

G. Construction Checklists: Prepare and submit detailed construction checklists for HVAC&R systems, subsystems, equipment, and components.

1. Contributors to the development of construction checklists shall include, but are not limited to, the following:

    a. HVAC&R systems and equipment installers.
    b. TAB technicians.
    c. HVAC&R instrumentation and controls installers.

H. Perform tests using design conditions, whenever possible.

1. Simulated conditions may, with approval of Architect, be imposed using an artificial load when it is impractical to test under design conditions. Before simulating conditions, calibrate testing instruments. Provide equipment to simulate loads. Set simulated conditions as directed by Commissioning Coordinator and document simulated conditions and methods of simulation. After tests, return configurations and settings to normal operating conditions.
2. Commissioning test procedures may direct that set points be altered when simulating conditions is impractical.

3. Commissioning test procedures may direct that sensor values be altered with a signal generator when design or simulating conditions and altering set points are impractical.

I. If tests cannot be completed because of a deficiency outside the scope of the HVAC&R system, document the deficiency and report it to Owner. After deficiencies are resolved, reschedule tests.

J. If seasonal testing is specified, complete appropriate initial performance tests and documentation and schedule seasonal tests.

K. Coordinate schedule with, and perform the following activities at the direction of, Commissioning Coordinator.

L. Comply with construction checklist requirements, including material verification, installation checks, start-up, and performance tests requirements specified in Sections specifying HVAC systems and equipment.

M. Provide technicians, instrumentation, tools, and equipment to complete and document the following:

1. Performance tests.
2. Demonstration of a sample of performance tests.
3. Commissioning tests.
4. Commissioning test demonstrations.

3.2 TAB COMMISSIONING TESTS

A. TAB Verification:

1. Prerequisites: Completion of "Examination" Article requirements and correction of deficiencies, as specified in Section 230593 "Testing, Adjusting, and Balancing for HVAC."
2. Completion of "Preparation" Article requirements for preparation of a TAB plan that includes strategies and step-by-step procedures, and system-readiness checks and reports, as specified in Section 230593 "Testing, Adjusting, and Balancing for HVAC."
3. Scope: HVAC&R air systems and hydronic piping systems.
4. Purpose: Differential flow relationships intended to maintain air pressurization differentials between the various areas of Project.

5. Conditions of the Test:

    a. Commissioning Test Demonstration Sampling Rate: As specified in "Inspections" Article in Section 230593 "Testing, Adjusting, and Balancing for HVAC."
    b. Systems operating in full heating mode with minimum outside-air volume.
    c. Systems operating in full cooling mode with minimum outside-air volume.

d. For measurements at air-handling units with economizer controls; systems operating in economizer mode with 100 percent outside air.

6. Acceptance Criteria:

a. Under all conditions, rechecked measurements comply with "Inspections" Article in Section 230593 "Testing, Adjusting, and Balancing for HVAC."
b. Additionally, no rechecked measurement shall differ from measurements documented in the final report by more than two times the tolerances allowed.
c. Under all conditions, where the Contract Documents indicate a differential in airflow between supply and exhaust and/or return in a space, the differential relationship shall be maintained.

3.3 TERMINAL UNIT EQUIPMENT COMMISSIONING TESTS

A. Unit Ventilators:

1. Prerequisites: Installation verification of the following:

a. Room Temperature Input Device: Room thermostat.
b. Room Temperature Output Device: Electronic damper actuators and control-valve operators.
c. Display the following at the operator's workstation:

1) Room/area served.
2) Room occupied/unoccupied.
3) Room temperature indication.
4) Room temperature set point.
5) Room temperature set point, occupied.
6) Room temperature set point, unoccupied.
7) Minimum outside air damper position.
   a) Record position required to meet Unit Ventilator and Ventilation Schedule.
8) Air-damper position as percentage open.
9) Hot water control-valve position as percentage open.
10) LEV valve operation.
11) Remote condensing unit status.

2. Scope: Unit ventilator with hydronic heating coils and variable refrigerant flow DX cooling coils in supply-air systems, and associated controls.

3. Purpose:

a. Occupancy-dependent room temperature set-point reset.
b. Room temperature control.

4. Conditions of the Test:

a. Commissioning Test Demonstration Sampling Rate: 10 percent of each model/size unit.
b. Temperature Control - Occupied: Start with the room unoccupied. Occupy the room and observe the change to occupied status. Observe temperature control until room temperature is stable at occupied set point plus or minus 1.0 deg F.
c. Temperature Control - Unoccupied: Start with the room occupied. Vacate the room and observe the change to unoccupied status. Observe temperature control until room temperature is stable at unoccupied set point plus or minus 1.0 deg F.
d. Fan Speed – Unit shall run at constant speed set during balancing.

5. Acceptance Criteria:

a. Temperature Control - Occupied:

1) Control system status changes from "occupied" to "unoccupied" after the specified time.
2) Room temperature is stable at occupied set point plus or minus 1.0 deg F within 10 minutes of occupancy. Room temperature does not overshoot or undershoot set point by more than 2.0 deg F during transition.
a) Fan speed should track temperature differential.

b. Temperature Control - Unoccupied:

1) Control system status changes from "unoccupied" to "occupied" immediately.
2) Room temperature is stable at unoccupied set point plus or minus 1.0 deg F within 30 minutes of occupancy.
a) Fan speed should be set to low.

B. Exhaust and Relief Air Pathways for Unit Ventilators

1. Provide visual inspection and means of confirming classroom relief air movement through existing ductwork, fans, and hoods. Identification of any missing or blocked pathways or inoperable dampers.

a. Identify any missing volume or control dampers necessary for balancing the system. Report shall include locations for correction and retesting.

b. See Spec. Section 230593 – Testing and Balancing for HVAC for requirements for testing existing exhaust fans for unit ventilator outside air relief.

3.4 HEATING CONTROL SYSTEM COMMISSIONING TESTS

A. Heating-Water Supply Temperature Control:

1. Prerequisites: Installation verification of the following:

    a. Startup of boiler and hot water-to-glycol converter.
    b. Startup of heating-water pumps.
    c. Startup of existing hot water and glycol circulating pumps.
    d. TAB of heating-water flow and pressure.
    e. Input Device: Heating-water supply temperature; resistance temperature sensor.
    f. Output Device: Control valve.
    g. Display the following at the operator's workstation:

        1) Heating-water supply temperature.
        2) Heating-water supply temperature set point.
        3) Control-valve position.

2. Scope: Heating-water system.
3. Purpose: Control of heating-water supply temperature at input device.
4. Conditions of the Test:

    a. Minimum heating-water flow.
    b. Midrange Heating-Water Flow: 50 to 60 percent of maximum.
    c. Maximum heating-water flow.

5. Acceptance Criteria: Under all conditions, heating-water supply temperature is within plus or minus 2.0 deg F of set point.

B. Heating-Water Supply Temperature Reset:

1. Prerequisites: Installation verification of the following:

    a. Startup of hot water-to-glycol converter.
    b. Startup of heating-water pumps.
    c. Startup of existing hot water and glycol water circulating pumps.
    d. TAB of heating-water flow and pressure.
    e. Input Device: Heating-water supply temperature; resistance temperature sensor.
    f. Input Device: Outdoor-air temperature; outdoor-air sensor.
    g. Output Device: Control valve.
    h. Display the following at the operator's workstation:

        1) Outdoor-air temperature.
        2) Heating-water supply temperature.
        3) Heating-water supply temperature set point.
        4) Control-valve position.

2. Scope: Heating-water system.
3. Purpose: Control of heating-water supply temperature at heating-water supply temperature input device in response to variable outdoor-air temperature input; outdoor-air-reset controller.

4. Conditions of the Test: Outdoor-air temperature input value may be overridden for this test.

    a. Low Temperature: Outdoor-air temperature between minus 30 and 0 deg F.
    b. Midrange Temperature: Outdoor-air temperature between 30 and 45 deg F.
    c. High Temperature: Outdoor-air temperature above 65 deg F.

5. Acceptance Criteria: Heating-water supply temperature resets in straight-line relationship with outdoor-air temperature for the reset schedule indicated on the drawings. Under all conditions, heating-water supply temperature is within 2.0 deg F of set point.

C. Control Primary Circulating Pumps:

1. Prerequisites: Installation verification of the following:

    a. Startup of heating-water pumps.
    b. Input Device: Outdoor-air temperature; outdoor-air sensor.
    c. Output Device: Heating-water pump; DDC system command to starter relay.
    d. Display the following at the operator's workstation:

        1) Outdoor-air temperature.
        2) Operating status of primary circulating pumps.

2. Scope: Heating-water pumps and associated controls.
3. Purpose: On-off control of heating-water pumps in response to variable outdoor-air temperature input; outdoor-air sensor.
4. Conditions of the Test:

    a. High Temperature: Outdoor-air temperature above 65 deg F.
    b. Low Temperature: Outdoor-air temperature below 65 deg F.

5. Acceptance Criteria:

    a. High Temperature: Pumps are off when outside-air temperature is above 65 deg F.
    b. Low Temperature: Pump) are on when outside-air temperature is below 65 deg F.

3.5 AIR-HANDLING AND ROOFTOP UNIT SYSTEM COMMISSIONING TESTS

A. Supply Fan(s) Variable-Volume Control:
1. Prerequisites: Installation verification of the following:
    a. Volume Control Input Device: Differential-pressure switch sensing supply-duct static pressure referenced to conditioned-space static pressure.
    b. Volume Control Output Device: DDC system analog output to modulating damper actuator.

2. Scope: Variable-air-volume supply fan units and associated controls.
3. Purpose:
   a. Supply-air discharge static pressure control.
   b. Response to excess supply-air discharge static pressure condition.
4. Conditions of the Test:
   a. Minimum supply-air flow.
   b. Midrange Supply-Air Flow: 50 to 60 percent of maximum.
   c. Maximum supply-air flow.
   d. Excess supply-air discharge static pressure.
5. Acceptance Criteria:
   a. At all supply-air flow rates, and during changes in supply-air flow, discharge air static pressure is at set point plus or minus 2 percent.
   b. Fan stops and an alarm is initiated at the operator's workstation when supply-air discharge static pressure is at the excess static pressure plus or minus 2 percent.

B. Air-Handler Mixed-Air Control:

1. Prerequisites: Installation verification of the following:

   a. Minimum Position Input Device: DDC system time schedule.
   b. Output Device: DDC system analog output to modulating damper actuators.
   c. Heating Reset Input Device: Room thermostat.
   d. Mixed-Air Temperature Input Device: Electronic temperature sensor.
   e. Cooling Reset Input Device: Outdoor- and return-air, duct-mounted electronic temperature sensors.
   f. Display the following at the operator's workstation:

      1) Mixed-air-temperature indication.
      2) Mixed-air-temperature set point.
      3) Mixed-air damper position.

2. Scope: Air handler with mixed-air control and associated controls.
3. Purpose:

   a. Occupied time control.
   b. Minimum damper position control.
   c. Heating reset control.
   d. Mixed-air temperature control.
   e. Cooling reset control.
   f. Unoccupied time control.

4. Conditions of the Test:

   a. Occupied Time Control: Start in unoccupied schedule. Advance to occupied schedule time.
   b. Minimum Damper Position Control: Command system to mode in which minimum damper position is required.
   c. Heating Reset Control: Create a call for heating.

d. Mixed-Air Temperature Control: Override mixed-air temperature set point to a value 2.0 deg F above current mixed-air temperature.
e. Cooling Reset Control: Override outdoor-air enthalpy to a value that exceeds return-air enthalpy.
f. Unoccupied Time Control: Advance to unoccupied schedule time.
g. Control Data Trend Log: Set up a data trend log of the following input device values and output device commands. Record data at hourly intervals. Submit trend data for 24-hour periods in which natural conditions require heating reset control, mixed-air temperature control, and cooling reset control.

1) Minimum position input device.
2) Heating reset input device.
3) Mixed-air temperature input device.
4) Cooling reset input device.

5. Acceptance Criteria:

a. Occupied Time Control: Mixed-air control is active in occupied mode.
b. Minimum Damper Position Control: Controller opens minimum outdoor-air dampers.
c. Heating Reset Control: Controller closes minimum outdoor-air dampers.
d. Mixed-Air Temperature Control: Controller modulates outdoor-, return-, and relief-air dampers to maintain temporary mixed-air temperature set point plus or minus 1.0 deg F.
e. Cooling Reset Control: Controller sets outdoor-air dampers to minimum position when outdoor-air enthalpy exceeds return-air enthalpy.
f. Unoccupied Time Control: Controller positions outdoor- and relief-air dampers closed and return-air dampers open.
g. Control Data Trend Log: Data verifies control according to sequence of control.

3.6 LIGHTING SYSTEM COMMISSION TESTS

A. Lighting Functional Testing;
1. Provide functional testing per section of C408.3.1 of the International Energy Conservation Code prior to passing final inspection. Testing shall include the following installed components:
a. Occupant sensor controls
1) Projects with seven or fewer occupant sensors, test each sensor.
2) Projects with more than seven occupant sensors, testing shall be done for each unique combination of sensor type and geometry, not less than 10% of each one.
b. Time-switch controls.

END OF SECTION 230800

SECTION 230900 - INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. See specification section 238129 – Variable Refrigerant Flow HVAC Systems for additional control system requirements and coordination.

1.2 SUMMARY

A. This Section includes control equipment for HVAC systems and components, including control components for terminal heating and cooling units not supplied with factory-wired controls. All buildings have existing Johnson Metasys control systems at are less than 5 years old. Control valves, actuators, and sensors may be re-used. Contractor to inspect all components to verify suitability for reuse and report any deficiencies to the engineer. Product controllers shall be replaced only if necessary.

The head end DDC system should not require any modification for this project except that graphics shall be replaced as needed to match the new equipment.

All new sequences are shown on the controls drawings.

1.3 DEFINITIONS

A. DDC: Direct digital control.
B. I/O: Input/output.
C. MS/TP: Master slave/token passing.
D. PC: Personal computer.
E. PID: Proportional plus integral plus derivative.
F. RTD: Resistance temperature detector.

1.4 SYSTEM PERFORMANCE

A. Comply with the following performance requirements:

1. Alarm Response Time: Annunciate alarm at workstation within 45 seconds. Multiple workstations must receive alarms within five seconds of each other.
2. Program Execution Frequency: Run capability of applications as often as five seconds, but selected consistent with mechanical process under control.

3. Performance: Programmable controllers shall execute DDC PID control loops, and scan and update process values and outputs at least once per second.
4. Reporting Accuracy and Stability of Control: Report values and maintain measured variables within tolerances as follows:

    a. Water Temperature: Plus or minus 1 deg F.
    b. Water Flow: Plus or minus 5 percent of full scale.
    c. Water Pressure: Plus or minus 2 percent of full scale.
    d. Space Temperature: Plus or minus 1 deg F.
    e. Ducted Air Temperature: Plus or minus 1 deg F.
    f. Outside Air Temperature: Plus or minus 2 deg F.
    g. Temperature Differential: Plus or minus 0.25 deg F.
    h. Relative Humidity: Plus or minus 5 percent.
    i. Airflow (Pressurized Spaces): Plus or minus 3 percent of full scale.
    j. Airflow (Measuring Stations): Plus or minus 5 percent of full scale.
    k. Airflow (Terminal): Plus or minus 10 percent of full scale.
    l. Air Pressure (Space): Plus or minus 0.01-inch wg.
    m. Air Pressure (Ducts): Plus or minus 0.1-inch wg.

1.5 SEQUENCE OF OPERATION – See Drawings.

1.6 ACTION SUBMITTALS

A. Product Data: Include manufacturer's technical literature for each control device. Indicate dimensions, capacities, performance characteristics, electrical characteristics, finishes for materials, and installation and startup instructions for each type of product indicated.

    1. DDC System Hardware: Bill of materials of equipment indicating quantity, manufacturer, and model number. Include technical data for operator workstation equipment, interface equipment, control units, transducers/transmitters, sensors, actuators, valves, relays/switches, control panels, and operator interface equipment.
    2. Controlled Systems: Instrumentation list with element name, type of device, manufacturer, model number, and product data. Include written description of sequence of operation including schematic diagram.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

    1. Bill of materials of equipment indicating quantity, manufacturer, and model number.
    2. Schematic flow diagrams showing fans, pumps, coils, dampers, valves, and control devices.
    3. Wiring Diagrams: Power, signal, and control wiring.
    4. Details of control panel faces, including controls, instruments, and labeling.
    5. Written description of sequence of operation.

6. Schedule of dampers including size, leakage, and flow characteristics.
7. Schedule of valves including flow characteristics.
8. DDC System Hardware:

    a. Wiring diagrams for control units with termination numbers.
    b. Schematic diagrams and floor plans for field sensors and control hardware.
    c. Schematic diagrams for control, communication, and power wiring, showing trunk data conductors and wiring between operator workstation and control unit locations.

9. Controlled Systems:

    a. Schematic diagrams of each controlled system with control points labeled and control elements graphically shown, with wiring.
    b. Scaled drawings showing mounting, routing, and wiring of elements including bases and special construction.
    c. Written description of sequence of operation including schematic diagram.
    d. Points list.

1.7 INFORMATIONAL SUBMITTALS

A. Data Communications Protocol Certificates: Certify that each proposed DDC system component complies with ASHRAE 135.

B. Field quality-control test reports.

1.8 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For HVAC instrumentation and control system to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

1. Maintenance instructions and lists of spare parts for each type of control device.
2. Interconnection wiring diagrams with identified and numbered system components and devices.
3. Keyboard illustrations and step-by-step procedures indexed for each operator function.
4. Inspection period, cleaning methods, cleaning materials recommended, and calibration tolerances.
5. Calibration records and list of set points.

B. Software and Firmware Operational Documentation: Include the following:

1. Software operating and upgrade manuals.
2. Program Software Backup: On a magnetic media or compact disc, complete with data files.
3. Device address list.
4. Printout of software application and graphic screens.

5. Software license required by and installed for DDC workstations and control systems.

1.9 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Replacement Materials: One replacement diaphragm or relay mechanism for each unique valve, motor controller, thermostat positioning relay.

1.10 QUALITY ASSURANCE

A. Installer Qualifications: Automatic control system manufacturer's authorized representative who is trained and approved for installation of system components required for this Project.

B. 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.

C. Comply with ASHRAE 135 for DDC system components.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Factory-Mounted Components: Where control devices specified in this Section are indicated to be factory mounted on equipment, arrange for shipping of control devices to equipment manufacturer.

B. System Software: Update to latest version of software at Project completion.

1.12 COORDINATION

A. Coordinate location of thermostats, humidistats, and other exposed control sensors with plans and room details before installation.

B. Coordinate supply of conditioned electrical branch circuits for control units and operator workstation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Basis of Design: Siemens APOGEE . Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

a. Johnson Controls, Inc.; Controls Group.
b. TAC Americas, INC.
c. Trane

2. Regardless of manufacturer, all control work shall integrate seamlessly with the existing Siemens APOGEE Control System's server, include the generation of new and modification of existing graphics, setpoint, monitoring and control sequences included in the scope of work. Gateways are not acceptable.

2.2 CONTROL SYSTEM

A. Control system shall consist of sensors, indicators, actuators, final control elements, interface equipment, other apparatus, and accessories to control mechanical systems.

B. Control system shall consist of sensors, indicators, actuators, final control elements, interface equipment, other apparatus, accessories, and software connected to distributed controllers operating in multiuser, multitasking environment on token-passing network and programmed to control mechanical systems. An operator workstation permits interface with the network via dynamic color graphics with each mechanical system, building floor plan, and control device depicted by point-and-click graphics.

2.3 DDC EQUIPMENT

A. Control Units: Modular, comprising processor board with programmable, nonvolatile, random-access memory; local operator access and display panel; integral interface equipment; and backup power source.

1. Units monitor or control each I/O point; process information; execute commands from other control units, devices, and operator stations; and download from or upload to operator workstation or diagnostic terminal unit.
2. Stand-alone mode control functions operate regardless of network status. Functions include the following:

a. Global communications.
b. Discrete/digital, analog, and pulse I/O.

c. Monitoring, controlling, or addressing data points.
d. Software applications, scheduling, and alarm processing.
e. Testing and developing control algorithms without disrupting field hardware and controlled environment.

3. Standard Application Programs:

a. Electric Control Programs: Demand limiting, duty cycling, automatic time scheduling, start/stop time optimization, night setback/setup, on-off control with differential sequencing, staggered start, antishort cycling, PID control, DDC with fine tuning, and trend logging.
b. HVAC Control Programs: Optimal run time, supply-air reset, and enthalpy switchover.
c. Chiller Control Programs: Control function of condenser-water reset, chilled-water reset, and equipment sequencing.
d. Programming Application Features: Include trend point; alarm processing and messaging; weekly, monthly, and annual scheduling; energy calculations; run-time totalization; and security access.
e. Remote communications.
f. Maintenance management.
g. Units of Measure: Inch-pound and SI (metric).

4. Local operator interface provides for download from or upload to operator workstation or diagnostic terminal unit.
5. ASHRAE 135 Compliance: Control units shall use ASHRAE 135 protocol and communicate using ISO 8802-3 (Ethernet) datalink/physical layer protocol.

B. Local Control Units: Modular, comprising processor board with electronically programmable, nonvolatile, read-only memory; and backup power source.

1. Units monitor or control each I/O point, process information, and download from or upload to operator workstation or diagnostic terminal unit.
2. Stand-alone mode control functions operate regardless of network status. Functions include the following:

a. Global communications.
b. Discrete/digital, analog, and pulse I/O.
c. Monitoring, controlling, or addressing data points.

3. Local operator interface provides for download from or upload to operator workstation or diagnostic terminal unit.
4. ASHRAE 135 Compliance: Control units shall use ASHRAE 135 protocol and communicate using ISO 8802-3 (Ethernet) datalink/physical layer protocol.

C. I/O Interface: Hardwired inputs and outputs may tie into system through controllers. Protect points so that shorting will cause no damage to controllers.

1. Binary Inputs: Allow monitoring of on-off signals without external power.
2. Pulse Accumulation Inputs: Accept up to 10 pulses per second.

3. Analog Inputs: Allow monitoring of low-voltage (0- to 10-V dc), current (4 to 20 mA), or resistance signals.
4. Binary Outputs: Provide on-off or pulsed low-voltage signal, selectable for normally open or normally closed operation with three-position (on-off-auto) override switches and status lights.
5. Analog Outputs: Provide modulating signal, either low voltage (0- to 10-V dc) or current (4 to 20 mA) with status lights, two-position (auto-manual) switch, and manually adjustable potentiometer.
6. Tri-State Outputs: Provide two coordinated binary outputs for control of three-point, floating-type electronic actuators.
7. Universal I/Os: Provide software selectable binary or analog outputs.

D. Power Supplies: Transformers with Class 2 current-limiting type or overcurrent protection; limit connected loads to 80 percent of rated capacity. DC power supply shall match output current and voltage requirements and be full-wave rectifier type with the following:

1. Output ripple of 5.0 mV maximum peak to peak.
2. Combined 1 percent line and load regulation with 100-mic.sec. response time for 50 percent load changes.
3. Built-in overvoltage and overcurrent protection and be able to withstand 150 percent overload for at least 3 seconds without failure.

E. Power Line Filtering: Internal or external transient voltage and surge suppression for workstations or controllers with the following:

1. Minimum dielectric strength of 1000 V.
2. Maximum response time of 10 nanoseconds.
3. Minimum transverse-mode noise attenuation of 65 dB.
4. Minimum common-mode noise attenuation of 150 dB at 40 to 100 Hz.

2.4 UNITARY CONTROLLERS

A. Unitized, capable of stand-alone operation with sufficient memory to support its operating system, database, and programming requirements, and with sufficient I/O capacity for the application.

1. Configuration: Local keypad and display; diagnostic LEDs for power, communication, and processor; wiring termination to terminal strip or card connected with ribbon cable; memory with bios; and 72-hour battery backup.
2. Operating System: Manage I/O communication to allow distributed controllers to share real and virtual object information and allow central monitoring and alarms. Perform scheduling with real-time clock. Perform automatic system diagnostics; monitor system and report failures.
3. ASHRAE 135 Compliance: Communicate using read (execute and initiate) and write (execute and initiate) property services defined in ASHRAE 135. Reside on network using MS/TP datalink/physical layer protocol and have service communication port for connection to diagnostic terminal unit.
4. Enclosure: Dustproof rated for operation at 32 to 120 deg F.

5. Enclosure: Waterproof rated for operation at 40 to 150 deg F.

2.5 ANALOG CONTROLLERS

A. Step Controllers: 6- or 10-stage type, with heavy-duty switching rated to handle loads and operated by electric motor.

B. Electric, Outdoor-Reset Controllers: Remote-bulb or bimetal rod-and-tube type, proportioning action with adjustable throttling range, adjustable set point, scale range minus 10 to plus 70 deg F, and single- or double-pole contacts.

C. Electronic Controllers: Wheatstone-bridge-amplifier type, in steel enclosure with provision for remote-resistance readjustment. Identify adjustments on controllers, including proportional band and authority.

1. Single controllers can be integral with control motor if provided with accessible control readjustment potentiometer.

D. Fan-Speed Controllers: Solid-state model providing field-adjustable proportional control of motor speed from maximum to minimum of 55 percent and on-off action below minimum fan speed. Controller shall briefly apply full voltage, when motor is started, to rapidly bring motor up to minimum speed. Equip with filtered circuit to eliminate radio interference.

E. Receiver Controllers: Single- or multiple-input models with control-point adjustment, direct or reverse acting with mechanical set-point adjustment with locking device, proportional band adjustment, authority adjustment, and proportional control mode.

1. Remote-control-point adjustment shall be plus or minus 20 percent of sensor span, input signal of 3 to 13 psig.
2. Proportional band shall extend from 2 to 20 percent for 5 psig.
3. Authority shall be 20 to 200 percent.
4. Gages: 2-1/2 inches in diameter, 2.5 percent wide-scale accuracy, and range to match transmitter input or output pressure.

2.6 ELECTRONIC SENSORS

A. Description: Vibration and corrosion resistant; for wall, immersion, or duct mounting as required.

B. Thermistor Temperature Sensors and Transmitters:

1. Accuracy: Plus or minus 0.5 deg F at calibration point.
2. Wire: Twisted, shielded-pair cable.
3. Insertion Elements in Ducts: Single point, 8 inches long; use where not affected by temperature stratification or where ducts are smaller than 9 sq. ft..
4. Averaging Elements in Ducts: 36 inches long, flexible; use where prone to temperature stratification or where ducts are larger than 10 sq. ft..

5. Insertion Elements for Liquids: Brass or stainless-steel socket with minimum insertion length of 2-1/2 inches.
6. Room Sensor Cover Construction: Manufacturer's standard locking covers.

    a. Set-Point Adjustment: Concealed.
    b. Set-Point Indication: Concealed.
    c. Thermometer: Concealed.
    d. Color: White

7. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight.
8. Room Security Sensors: Stainless-steel cover plate with insulated back and security screws.

C. RTDs and Transmitters:

1. Accuracy: Plus or minus 0.2 percent at calibration point.
2. Wire: Twisted, shielded-pair cable.
3. Insertion Elements in Ducts: Single point, 8 inches long; use where not affected by temperature stratification or where ducts are smaller than 9 sq. ft..
4. Averaging Elements in Ducts: 18 inches long, rigid; use where prone to temperature stratification or where ducts are larger than 9 sq. ft.; length as required.
5. Insertion Elements for Liquids: Brass socket with minimum insertion length of 2-1/2 inches.
6. Room Sensor Cover Construction: Manufacturer's standard locking covers.

    a. Set-Point Adjustment: Concealed.
    b. Set-Point Indication: Concealed.
    c. Thermometer: Concealed.
    d. Color: White.

7. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight.
8. Room Security Sensors: Stainless-steel cover plate with insulated back and security screws.

D. Humidity Sensors: Bulk polymer sensor element.

1. Accuracy: 2 percent full range with linear output.
2. Duct Sensor: 20 to 80 percent relative humidity range with element guard and mounting plate.
3. Outside-Air Sensor: 20 to 80 percent relative humidity range with mounting enclosure, suitable for operation at outdoor temperatures of minus 22 to plus 185 deg F.
4. Duct and Sensors: With element guard and mounting plate, range of 0 to 100 percent relative humidity.

E. Pressure Transmitters/Transducers:

1. Static-Pressure Transmitter: Nondirectional sensor with suitable range for expected input, and temperature compensated.

a. Accuracy: 2 percent of full scale with repeatability of 0.5 percent.
b. Output: 4 to 20 mA.
c. Building Static-Pressure Range: 0- to 0.25-inch wg.
d. Duct Static-Pressure Range: 0- to 5-inch wg.

2. Water Pressure Transducers: Stainless-steel diaphragm construction, suitable for service; minimum 150-psig operating pressure; linear output 4 to 20 mA.
3. Water Differential-Pressure Transducers: Stainless-steel diaphragm construction, suitable for service; minimum 150-psig operating pressure and tested to 300-psig; linear output 4 to 20 mA.
4. Differential-Pressure Switch (Air or Water): Snap acting, with pilot-duty rating and with suitable scale range and differential.
5. Pressure Transmitters: Direct acting for gas, liquid, or steam service; range suitable for system; linear output 4 to 20 mA.

F. Room Sensor Cover Construction: Manufacturer's standard locking covers.

2.7 STATUS SENSORS

A. Status Inputs for Fans: Differential-pressure switch with pilot-duty rating and with adjustable range of 0- to 5-inch wg.

B. Status Inputs for Pumps: Differential-pressure switch with pilot-duty rating and with adjustable pressure-differential range of 8 to 60 psig, piped across pump.

C. Status Inputs for Electric Motors: Comply with ISA 50.00.01, current-sensing fixed- or split-core transformers with self-powered transmitter, adjustable and suitable for 175 percent of rated motor current.

D. Voltage Transmitter (100- to 600-V ac): Comply with ISA 50.00.01, single-loop, self-powered transmitter, adjustable, with suitable range and 1 percent full-scale accuracy.

E. Power Monitor: 3-phase type with disconnect/shorting switch assembly, listed voltage and current transformers, with pulse kilowatt hour output and 4- to 20-mA kW output, with maximum 2 percent error at 1.0 power factor and 2.5 percent error at 0.5 power factor.

F. Current Switches: Self-powered, solid-state with adjustable trip current, selected to match current and system output requirements.

G. Electronic Valve/Damper Position Indicator: Visual scale indicating percent of travel and 2- to 10-V dc, feedback signal.

H. Water-Flow Switches: Bellows-actuated mercury or snap-acting type with pilot-duty rating, stainless-steel or bronze paddle, with appropriate range and differential adjustment, in NEMA 250, Type 1 enclosure.

2.8 FLOW MEASURING STATIONS

A. Duct Airflow Station: Combination of air straightener and multiport, self-averaging pitot tube station.

1. Casing: Galvanized-steel frame.
2. Flow Straightener: Aluminum honeycomb, 3/4-inch parallel cell, 3 inches deep.
3. Sensing Manifold: Copper manifold with bullet-nosed static pressure sensors positioned on equal area basis.

2.9 THERMOSTATS

A. Mercury thermometers and sensors are not permitted.

B. Electric, solid-state, microcomputer-based room thermostat with remote sensor.

1. Automatic switching from heating to cooling.
2. Preferential rate control to minimize overshoot and deviation from set point.
3. Set up for four separate temperatures per day.
4. Instant override of set point for continuous or timed period from 1 hour to 31 days.
5. Short-cycle protection.
6. Programming based on every day of week.
7. Selection features include degree F or degree C display, 12- or 24-hour clock, keyboard disable, remote sensor, and fan on-auto.
8. Battery replacement without program loss.
9. Thermostat display features include the following:

    a. Time of day.
    b. Actual room temperature.
    c. Programmed temperature.
    d. Programmed time.
    e. Duration of timed override.
    f. Day of week.
    g. System mode indications include "heating," "off," "fan auto," and "fan on."

C. Remote-Bulb Thermostats: On-off or modulating type, liquid filled to compensate for changes in ambient temperature; with copper capillary and bulb, unless otherwise indicated.

1. Bulbs in water lines with separate wells of same material as bulb.
2. Bulbs in air ducts with flanges and shields.
3. Averaging Elements: Copper tubing with either single- or multiple-unit elements, extended to cover full width of duct or unit; adequately supported.
4. Scale settings and differential settings are clearly visible and adjustable from front of instrument.
5. On-Off Thermostat: With precision snap switches and with electrical ratings required by application.

6. Modulating Thermostats: Construct so complete potentiometer coil and wiper assembly is removable for inspection or replacement without disturbing calibration of instrument.

D. Fire-Protection Thermostats: Listed and labeled by an NRTL acceptable to authorities having jurisdiction; with fixed or adjustable settings to operate at not less than 75 deg F above normal maximum operating temperature, and the following:

1. Reset: Manual.
2. Reset: Automatic, with control circuit arranged to require manual reset at central control panel; with pilot light and reset switch on panel labeled to indicate operation.

E. Immersion Thermostat: Remote-bulb or bimetal rod-and-tube type, proportioning action with adjustable throttling range and adjustable set point.

F. Airstream Thermostats: Two-pipe, fully proportional, single-temperature type; with adjustable set point in middle of range, adjustable throttling range, plug-in test fitting or permanent pressure gage, remote bulb, bimetal rod and tube, or averaging element.

G. Electric, Low-Limit Duct Thermostat: Snap-acting, single-pole, single-throw, manual- or automatic- reset switch that trips if temperature sensed across any 12 inches of bulb length is equal to or below set point.

1. Bulb Length: Minimum 20 feet.
2. Quantity: One thermostat for every 20 sq. ft. of coil surface.

H. Electric, High-Limit Duct Thermostat: Snap-acting, single-pole, single-throw, manual- or automatic- reset switch that trips if temperature sensed across any 12 inches of bulb length is equal to or above set point.

1. Bulb Length: Minimum 20 feet.
2. Quantity: One thermostat for every 20 sq. ft. of coil surface.

I. Heating/Cooling Valve-Top Thermostats: Proportional acting for proportional flow, with molded-rubber diaphragm, remote-bulb liquid-filled element, direct and reverse acting at minimum shutoff pressure of 25 psig, and cast housing with position indicator and adjusting knob.

2.10 CO2 Sensors

A. Wall Mount – Mount at locations shown on drawings.

B. Sensor Requirements
1. Accuracy: 3% of reading or ±40 ppm
2. Signal Output: 0-10V (10k min.) or 4-20 mA
3. Repeatability: ±20 ppm
4. Measurement Range: 0-2000 ppm CO2
5. Sensing Technology: Non-dispersive IR (NDIR)

6. Calibration: Push button @ 2000 ppm
7. Calibration Interval: 5 years
8. Life Expectancy: 10 years typical
9. Warranty: 3 years
10. Visual Indication: Green 1000 ppm, Red > 2000 ppm
11. Warm Up Time: 3 minutes
12. Response Time: <1 minute
13. Operating Temperature: 31° to 122ºF
14. Operating Humidity: 0% to 99% RH (noncondensing)Comply with requirements in Section 230513 "Common Motor Requirements for HVAC Equipment."

2.11 HUMIDISTATS

A. Duct-Mounting Humidistats: Electric insertion, 2-position type with adjustable, 2 percent throttling range, 20 to 80 percent operating range, and single- or double-pole contacts.

2.12 ACTUATORS

A. Electric Motors: Size to operate with sufficient reserve power to provide smooth modulating action or two-position action.

1. Comply with requirements in Section 230513 "Common Motor Requirements for HVAC Equipment."
2. Permanent Split-Capacitor or Shaded-Pole Type: Gear trains completely oil immersed and sealed. Equip spring-return motors with integral spiral-spring mechanism in housings designed for easy removal for service or adjustment of limit switches, auxiliary switches, or feedback potentiometer.
3. Spring-Return Motors for Valves Larger Than NPS 2-1/2: Size for running and
4. Spring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running and breakaway torque of 150 in. x lbf.

B. Electronic Actuators: Direct-coupled type designed for minimum 60,000 full-stroke cycles at rated torque.

1. Manufacturers:

    a. Belimo Aircontrols (USA), Inc.

2. Valves: Size for torque required for valve close off at maximum pump differential pressure.
3. Dampers: Size for running torque calculated as follows:
    a. Parallel-Blade Damper with Edge Seals: 7 inch-lb/sq. ft. of damper.
    b. Dampers with 2- to 3-Inch wg of Pressure Drop or Face Velocities of 1000 to 2500 fpm: Increase running torque by 1.5.
4. Coupling: V-bolt and V-shaped, toothed cradle.
5. Overload Protection: Electronic overload or digital rotation-sensing circuitry.
6. Fail-Safe Operation: Mechanical, spring-return mechanism. Provide external, manual gear release on non-spring-return actuators.

7. Power Requirements (Two-Position Spring Return): 24-V ac.
8. Power Requirements (Modulating): Maximum 10 VA at 24-V ac or 8 W at 24-V dc.
9. Proportional Signal: 2-10-V dc or 4-20 mA, and 2-10-V dc position feedback signal.
10. Temperature Rating: Minus 22 to plus 122 deg F.
11. Temperature Rating (Smoke Dampers): Minus 22 to plus 250 deg F.
12. Run Time: 12 seconds open, 5 seconds closed.

2.13 CONTROL VALVES

A. Manufacturers:

1. Danfoss Inc.; Air Conditioning & Refrigeration Div.
2. Neles-Jamesbury.
3. Parker Hannifin Corporation; Skinner Valve Division.
4. Pneuline Controls.
5. Sauter Controls Corporation.

B. Control Valves: Factory fabricated, of type, body material, and pressure class based on maximum pressure and temperature rating of piping system, unless otherwise indicated.

C. Hydronic system globe valves shall have the following characteristics:

1. NPS 2 and Smaller: Class 125 bronze body, bronze trim, rising stem, renewable composition disc, and screwed ends with backseating capacity repackable under pressure.

2. Internal Construction: Replaceable plugs and stainless-steel or brass seats.

   a. Single-Seated Valves: Cage trim provides seating and guiding surfaces for plug on top and bottom.
   b. Double-Seated Valves: Balanced plug; cage trim provides seating and guiding surfaces for plugs on top and bottom.

3. Sizing: 3-psig maximum pressure drop at design flow rate or the following:

   a. Two Position: Line size.
   b. Two-Way Modulating: Either the value specified above or twice the load pressure drop, whichever is more.

4. Flow Characteristics: Two-way valves shall have equal percentage characteristics.

5. Close-Off (Differential) Pressure Rating: Combination of actuator and trim shall provide minimum close-off pressure rating of 150 percent of total system (pump) head for two-way valves and 100 percent of pressure differential across valve or 100 percent of total system (pump) head.

D. Terminal Unit Control Valves: Bronze body, bronze trim, two or three ports as indicated, replaceable plugs and seats, and union and threaded ends.

1. Rating: Class 125 for service at 125 psig and 250 deg F operating conditions.
2. Sizing: 3-psig maximum pressure drop at design flow rate, to close against pump shutoff head.
3. Flow Characteristics: Two-way valves shall have equal percentage characteristics; three-way valves shall have linear characteristics.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that conditioned power supply is available to control units and operator workstation.

3.2 INSTALLATION

A. Install software in control units and operator workstation(s). Implement all features of programs to specified requirements and as appropriate to sequence of operation.

B. Connect and configure equipment and software to achieve sequence of operation specified.

A. Verify location of thermostats with Drawings and room details before installation. Install devices 48 inches above the floor.

B. Install guards on thermostats in the following locations:

1. Entrances.
2. Public areas.
3. Where indicated.

C. Install labels and nameplates to identify control components according to Section 230553 "Identification for HVAC Piping and Equipment."

D. Install hydronic instrument wells, valves, and other accessories according to Section 232113 Hydronic Piping Specialties."

E. Install refrigerant instrument wells, valves, and other accessories according to Section 232300 "Refrigerant Piping."

3.3 ELECTRICAL WIRING AND CONNECTION INSTALLATION

A. Install raceways, boxes, and cabinets according to Section 260533 "Raceways and Boxes for Electrical Systems."

B. Install building wire and cable according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

~~C.~~ Install signal and communication cable as follows:

1. Conceal cable, except in mechanical rooms and areas where other conduit and piping are exposed.
2. Install exposed cable in raceway.
3. Install concealed cable in raceway.
4. Bundle and harness multiconductor instrument cable in place of single cables where several cables follow a common path.
5. Fasten flexible conductors, bridging cabinets and doors, along hinge side; protect against abrasion. Tie and support conductors.
6. Number-code or color-code conductors for future identification and service of control system, except local individual room control cables.
7. Install wire and cable with sufficient slack and flexible connections to allow for vibration of piping and equipment.

D. Connect manual-reset limit controls independent of manual-control switch positions. Automatic duct heater resets may be connected in interlock circuit of power controllers.

E. Connect hand-off-auto selector switches to override automatic interlock controls when switch is in hand position.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:

1. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove and replace malfunctioning units and retest.
2. Test and adjust controls and safeties.
3. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
4. Test calibration of electronic controllers by disconnecting input sensors and stimulating operation with compatible signal generator.
5. Test each point through its full operating range to verify that safety and operating control set points are as required.
6. Test each control loop to verify stable mode of operation and compliance with sequence of operation. Adjust PID actions.
7. Test each system for compliance with sequence of operation.
8. Test software and hardware interlocks.

C. DDC Verification:

1. Verify that instruments are installed before calibration, testing, and loop or leak checks.
2. Check instruments for proper location and accessibility.
3. Check instrument installation for direction of flow, elevation, orientation, insertion depth, and other applicable considerations.
4. Check instrument tubing for proper fittings, slope, material, and support.
5. Check installation of air supply for each instrument.
6. Check flow instruments. Inspect tag number and line and bore size, and verify that inlet side is identified and that meters are installed correctly.
7. Check pressure instruments, piping slope, installation of valve manifold, and self-contained pressure regulators.
8. Check temperature instruments and material and length of sensing elements.
9. Check control valves. Verify that they are in correct direction.
10. Check air-operated dampers. Verify that pressure gages are provided and that proper blade alignment, either parallel or opposed, has been provided.
11. Check DDC system as follows:

    a. Verify that DDC controller power supply is from emergency power supply, if applicable.
    b. Verify that wires at control panels are tagged with their service designation and approved tagging system.
    c. Verify that spare I/O capacity has been provided.
    d. Verify that DDC controllers are protected from power supply surges.

D. Provide up to two days assistance to the commissioning agent to assist in commissioning. Provide login and password to CxA so he can log into the system and test the system and sequences of operation.

E. Provide up to two days assistance to the TAB contractor to assist in balancing systems for min/max air flows and to satisfy the DCV sequence of operation.

F. Replace damaged or malfunctioning controls and equipment and repeat testing procedures.

3.5 ADJUSTING

A. Calibrating and Adjusting:

1. Calibrate instruments.
2. Make three-point calibration test for both linearity and accuracy for each analog instrument.
3. Calibrate equipment and procedures using manufacturer's written recommendations and instruction manuals. Use test equipment with accuracy at least double that of instrument being calibrated.
4. Control System Inputs and Outputs:

    a. Check analog inputs at 0, 50, and 100 percent of span.
    b. Check analog outputs using milliampere meter at 0, 50, and 100 percent output.

c. Check digital inputs using jumper wire.
d. Check digital outputs using ohmmeter to test for contact making or breaking.
e. Check resistance temperature inputs at 0, 50, and 100 percent of span using a precision-resistant source.

5. Flow:

a. Set differential pressure flow transmitters for 0 and 100 percent values with 3-point calibration accomplished at 50, 90, and 100 percent of span.
b. Manually operate flow switches to verify that they make or break contact.

6. Pressure:

a. Calibrate pressure transmitters at 0, 50, and 100 percent of span.
b. Calibrate pressure switches to make or break contacts, with adjustable differential set at minimum.

7. Temperature:

a. Calibrate resistance temperature transmitters at 0, 50, and 100 percent of span using a precision-resistance source.
b. Calibrate temperature switches to make or break contacts.

8. Stroke and adjust control valves and dampers without positioners, following the manufacturer's recommended procedure, so that valve or damper is 100 percent open and closed.
9. Stroke and adjust control valves and dampers with positioners, following manufacturer's recommended procedure, so that valve and damper is 0, 50, and 100 percent closed.
10. Provide diagnostic and test instruments for calibration and adjustment of system.
11. Provide written description of procedures and equipment for calibrating each type of instrument. Submit procedures review and approval before initiating startup procedures.

B. Adjust initial temperature and humidity set points.

C. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to three visits to Project during other than normal occupancy hours for this purpose.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain HVAC instrumentation and controls.

B. Provide eight hours of training in two four-hour blocks. Training periods shall be spaced by at least four weeks.

END OF SECTION 230900

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SECTION 230924 - CONTROL VALVES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes control valves and actuators for DDC systems.

B. Related Requirements:

1. Section 230900 "Instrumentation and Control for HVAC" control equipment and software, relays, electrical power devices, uninterruptible power supply units, wire, and cable.

1.3 DEFINITIONS

A. Cv: Design valve coefficient.
B. DDC: Direct-digital control.
C. NBR: Nitrile butadiene rubber.
D. PTFE: Polytetrafluoroethylene

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product, including the following:

1. Construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Operating characteristics, electrical characteristics, and furnished accessories indicating process operating range, accuracy over range, control signal over range, default control signal with loss of power, calibration data specific to each unique application, electrical power requirements, and limitations of ambient operating environment, including temperature and humidity.
3. Product description with complete technical data, performance curves, and product specification sheets.
4. Installation, operation, and maintenance instructions, including factors affecting performance.

B. Shop Drawings:

1. Include plans, elevations, sections, and mounting details.
2. Include details of product assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plan drawings and corresponding product installation details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Control valve installation location shown in relationship to room, duct, pipe, and equipment.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For control valves to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. ASME Compliance: Fabricate and label products to comply with ASME Boiler and Pressure Vessel Code where required by authorities having jurisdiction.

C. Ground Fault: Products shall not fail due to ground fault condition when suitably grounded.

D. Determine control valve sizes and flow coefficients by ISA 75.01.01.

E. Control valve characteristics and rangeability shall comply with ISA 75.11.01.

F. Selection Criteria:

1. Control valve shutoff classifications shall be FCI 70-2, Class IV or better unless otherwise indicated.
2. Valve pattern, three-way or straight through, shall be as indicated on Drawings.
3. Modulating straight-through pattern control valves shall have equal percentage flow-throttling characteristics unless otherwise indicated.

4. Modulating three-way pattern water valves shall have linear flow-throttling characteristics. The total flow through the valve shall remain constant regardless of the valve's position.
5. Rotary-type control valves, such as ball valves, shall have Cv falling between 65 and 75 degrees of valve full open position and minimum valve Cv between 15 and 25 percent of open position.
6. Selection shall consider viscosity, flashing, and cavitation corrections.
7. Valves shall have stable operation throughout full range of operation, from design to minimum Cv.
8. Minimum Cv shall be calculated at 10 percent of design flow, with a coincident pressure differential equal to the system design pump head.
9. In water systems, select modulating control valves at terminal equipment for a design Cv based on a pressure drop of 5 psig at design flow unless otherwise indicated.
10. Two-position control valves shall be line size unless otherwise indicated.
11. In water systems, use ball-style control valves for two-position control for valves NPS 2 and smaller and butterfly style for valves larger than NPS 2.

2.2 BALL-STYLE CONTROL VALVES

A. Ball Valves with Single Port and Segmented Ball:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. Valve Solutions, Inc.
    b. Belimo Aircontrols (USA), Inc.
    c. HCI; Hydronics Components Inc.
    d. Siemens Industry, Inc., Building Technologies Division.

2. Performance:

    a. Process Temperature Rating: Minus 20 to plus 450 deg F.
    b. ASME B16.34, Class 150.
    c. Leakage: FCI 70-2, Class IV.
    d. Rangeability: 300 to 1.
    e. Rotation: Zero to 90 degrees.
    f. Equal percentage flow characteristic.

3. ASME B16.10 face-to-face dimensions.
4. Valves NPS 2 and Smaller: Threaded (NPT) ends.
5. Valves NPS 2-1/2 through NPS 6: Flanged ends suitable for mating to ASME B16.5 flanges.
6. Body: Carbon or stainless steel.
7. Ball and Shaft: Stainless steel.
8. Shaft and Segmented Ball: Pinned and welded.
9. Ball Seat: Graphite.

10. Packing: PTFE V-rings and graphite packing follower.
11. Replaceable seat, ball, and shaft packing.
12. Label each valve with following:

    a. Manufacturer's name, model number, and serial number.
    b. Body size.
    c. Flow directional arrow.

B. Ball Valves with Segmented Ball, Three-Way Pattern:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. Valve Solutions, Inc.
    b. Belimo Aircontrols (USA), Inc.
    c. HCI; Hydronics Components Inc.
    d. Siemens Industry, Inc., Building Technologies Division.

2. Arrangement: Two single-port valves mated to a fabricated tee with interconnecting mechanical linkage.

3. Performance:

    a. Process Temperature Rating: Minus 20 to plus 450 deg F.
    b. ASME B16.34, Class 150.
    c. Leakage: FCI 70-2, Class IV.
    d. Rangeability: 300 to 1.
    e. Rotation: Zero to 90 degrees.
    f. Equal percentage flow characteristic.

4. Face-to-Face Dimensions: ASME B16.10.
5. Valves NPS 3through NPS 6: Flanged ends suitable for mating to ASME B16.5 flanges.
6. Body: Carbon or stainless steel.
7. Ball and Shaft: Stainless steel.
8. Shaft and Segmented Ball: Pinned and welded.
9. Ball Seat: Graphite.
10. Packing: PTFE V-rings and graphite packing follower.
11. Replaceable seat, ball, and shaft packing.
12. Label each valve with following:

    a. Manufacturer's name, model number, and serial number.
    b. Body size.
    c. Flow directional arrow.

C. Pressure-Independent Ball Valves NPS 2 and Smaller:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. Belimo Aircontrols (USA), Inc.
    b. HCI; Hydronics Components Inc.
    c. Siemens Industry, Inc., Building Technologies Division.

2. Performance:

    a. Pressure Rating: 600 psig for NPS 1 and 400 psig for NPS 1-1/2 and NPS 2.
    b. Close-off pressure of 200 psig.
    c. Process Temperature Range: Between zero to 212 deg F.
    d. Rangeability: 100 to 1.

3. Integral Pressure Regulator: Located upstream of ball to regulate pressure, to maintain a constant pressure differential while operating within a pressure differential range of 5 to 50 psig.
4. Body: Forged brass, nickel plated, and with threaded ends.
5. Ball: Chrome-plated brass.
6. Stem and Stem Extension: Chrome-plated brass, blowout-proof design.
7. Stem sleeve or other approved means to allow valve to be opened and closed without damaging field-applied insulation and insulation vapor barrier seal.
8. Ball Seats: Reinforced PTFE.
9. Stem Seal: Reinforced PTFE packing ring stem seal with threaded packing ring follower to retain the packing ring under design pressure with the linkage removed. Alternative means, such as EPDM O-rings, are acceptable if equivalent cycle endurance can be achieved.
10. Flow Characteristic: Equal percentage.

2.3 ELECTRIC AND ELECTRONIC CONTROL VALVE ACTUATORS

A. Actuators for Hydronic Control Valves: Capable of closing valve against system pump shutoff head.

B. Position indicator and graduated scale on each actuator.

C. Type: Motor operated, with or without gears, electric and electronic.

D. Voltage: 24-V ac.

E. Deliver torque required for continuous uniform movement of controlled device from limit to limit when operated at rated voltage.

F. Function properly within a range of 85 to 120 percent of nameplate voltage.

G. Construction:

1. For Actuators Less Than 100 W: Fiber or reinforced nylon gears with steel shaft, copper alloy or nylon bearings, and pressed steel enclosures.
2. For Actuators from 100 to 400 W: Gears ground steel, oil immersed, shaft hardened steel running in bronze, copper alloy or ball bearings. Operator and gear trains shall be totally enclosed in dustproof cast-iron, cast-steel or cast-aluminum housing.

H. Field Adjustment:

1. Spring Return Actuators: Easily switchable from fail open to fail closed in the field without replacement.

I. Two-Position Actuators: Single direction, spring return or reversing type.

J. Modulating Actuators:

1. Operation: Capable of stopping at all points across full range, and starting in either direction from any point in range.
2. Control Input Signal:

    a. Three Point, Tristate, or Floating Point: Clockwise and counter-clockwise inputs. One input drives actuator to open position and other input drives actuator to close position. No signal of either input remains in last position.
    b. Proportional: Actuator drives proportional to input signal and modulates throughout its angle of rotation. Suitable for zero- to 10- or 2- to 10-V dc and 4- to 20-mA signals.
    c. Pulse Width Modulation (PWM): Actuator drives to a specified position according to pulse duration (length) of signal from a dry contact closure, triac sink, or source controller.
    d. Programmable Multi-Function:

        1) Control Input, Position Feedback, and Running Time: Factory or field programmable.
        2) Diagnostic: Feedback of hunting or oscillation, mechanical overload, mechanical travel, and mechanical load limit.
        3) Service Data: Include, at a minimum, number of hours powered and number of hours in motion.

K. Fail-Safe:

1. Where indicated, provide actuator to fail to an end position.
2. Internal spring return mechanism to drive controlled device to an end position (open or close) on loss of power.
3. Batteries, capacitors, and other non-mechanical forms of fail-safe operation are acceptable only where uniquely indicated.

L. Integral Overload Protection:

1. Provide against overload throughout the entire operating range in both directions.

2. Electronic overload, digital rotation sensing circuitry, mechanical end switches, or magnetic clutches are acceptable methods of protection.

M. Valve Attachment:

1. Unless otherwise required for valve interface, provide an actuator designed to be directly coupled to valve shaft without the need for connecting linkages.
2. Attach actuator to valve drive shaft in a way that ensures maximum transfer of power and torque without slippage.
3. Bolt and set screw method of attachment is acceptable only if provided with at least two points of attachment.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for valves installed in piping to verify actual locations of piping connections before installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Furnish and install products required to satisfy most stringent requirements indicated.

B. Install products level, plumb, parallel, and perpendicular with building construction.

C. Properly support instruments, wiring, and conduits to comply with requirements indicated.

D. Provide ceiling, floor, roof, and wall openings and sleeves required by installation. Before proceeding with drilling, punching, or cutting, check location first for concealed products that could potentially be damaged. Patch, flash, grout, seal, and refinish openings to match adjacent condition.

E. Firestop penetrations made in fire-rated assemblies and seal penetrations made in acoustically rated assemblies.

F. Fastening Hardware:

1. Stillson wrenches, pliers, and other tools that will cause injury to or mar surfaces of rods, nuts, and other parts are prohibited for assembling and tightening nuts.
2. Tighten bolts and nuts firmly and uniformly. Do not overstress threads by excessive force or by oversized wrenches.
3. Lubricate threads of bolts, nuts, and screws with graphite and oil before assembly.

G. Install products in locations that are accessible and that will permit calibration and maintenance from floor, equipment platforms, or catwalks. Where ladders are required for Owner's access, confirm unrestricted ladder placement is possible under occupied condition.

3.3 ELECTRIC POWER

A. Furnish and install electrical power to products requiring electrical connections.

B. Furnish and install power wiring. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

C. Furnish and install raceways. Comply with requirements in Section 260533 "Raceways and Boxes for Electrical Systems."

3.4 CONTROL VALVES

A. Install pipe reducers for valves smaller than line size. Position reducers as close to valve as possible but at distance to avoid interference and impact to performance. Install with manufacturer-recommended clearance.

B. Install flanges or unions to allow drop-in and -out valve installation.

C. Install drain valves in piping upstream and downstream of each control valve installed in a three-valve manifold and for each control valve larger than NPS 2.

D. Valve Orientation:

1. Where possible, install globe and ball valves installed in horizontal piping with stems upright and not more than 15 degrees off of vertical, not inverted.
2. Install valves in a position to allow full stem movement.
3. Where possible, install butterfly valves that are installed in horizontal piping with stems in horizontal position and with low point of disc opening with direction of flow.

E. Clearance:

1. Locate valves for easy access and provide separate support of valves that cannot be handled by service personnel without hoisting mechanism.

2. Install valves with at least 12 inches of clear space around valve and between valves and adjacent surfaces.

F. Threaded Valves:

1. Note internal length of threads in valve ends, and proximity of valve internal seat or wall, to determine how far pipe should be threaded into valve.
2. Align threads at point of assembly.
3. Apply thread compound to external pipe threads, except where dry seal threading is specified.
4. Assemble joint, wrench tight. Apply wrench on valve end as pipe is being threaded.

3.5 CONNECTIONS

A. Connect electrical devices and components to electrical grounding system. Comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems."

3.6 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Each piece of wire, cable, and tubing shall have the same designation at each end for operators to determine continuity at points of connection. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.7 CLEANING

A. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from exposed interior and exterior surfaces.

3.8 CHECKOUT PROCEDURES

A. Control Valve Checkout:

1. Check installed products before continuity tests, leak tests, and calibration.
2. Check valves for proper location and accessibility.
3. Check valves for proper installation for direction of flow, elevation, orientation, insertion depth, or other applicable considerations that will impact performance.
4. Verify that control valves are installed correctly for flow direction.
5. Verify that valve body attachment is properly secured and sealed.
6. Verify that valve actuator and linkage attachment are secure.
7. Verify that actuator wiring is complete, enclosed, and connected to correct power source.
8. Verify that valve ball, disc, and plug travel are unobstructed.

9. After piping systems have been tested and put into service, but before insulating and balancing, inspect each valve for leaks. Adjust or replace packing to stop leaks. Replace the valve if leaks persist.

3.9 ADJUSTMENT, CALIBRATION, AND TESTING

A. Stroke and adjust control valves following manufacturer's recommended procedure, from 100 percent open to 100 percent closed back to 100 percent open.

B. Stroke control valves with pilot positioners. Adjust valve and positioner following manufacturer's recommended procedure, so valve is 100 percent closed, 50 percent closed, and 100 percent open at proper air pressures.

C. Check and document open and close cycle times for applications with a cycle time of less than 30 seconds.

END OF SECTION 230924

SECTION 232113 - HYDRONIC PIPING AND SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes pipe and fitting materials, joining methods, special-duty valves, and specialties for the following:

1. Hot-water heating piping.
2. Makeup-water piping
3. Condensate-drain piping
4. Air Control Devices
5. Safety-valve-inlet and –outlet piping

1.3 SUBMITTALS

A. Product Data: For each type of the following:

1. Pressure-seal fittings.
2. Valves. Include flow and pressure drop curves based on manufacturer's testing for calibrated-orifice balancing valves and automatic flow-control valves.
3. Air control devices.
4. Hydronic specialties.

B. Qualification Data: For Installer.

C. Field quality-control test reports.

D. Operation and Maintenance Data: For air control devices, hydronic specialties, and special-duty valves to include in emergency, operation, and maintenance manuals.

1.4 QUALITY ASSURANCE

A. Installer Qualifications:

1. Installers of Pressure-Sealed Joints: Installers shall be certified by the pressure-seal joint manufacturer as having been trained and qualified to join piping with pressure-seal pipe couplings and fittings.

B. Steel Support Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

C. Pipe Welding: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code: Section IX.

1. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.
2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Hydronic piping components and installation shall be capable of withstanding the following minimum working pressure and temperature unless otherwise indicated:

1. Hot-Water Heating Piping: 150 psig at 200 deg F.
2. Chilled-Water Piping: 150 psig at 200 deg F.
3. Dual-Temperature Heating and Cooling Water Piping: 150 psig at 200 deg F.
4. Condenser-Water Piping: 150 psig at 150 deg F.
5. Makeup-Water Piping: 80 psig at 150 deg F.
6. Condensate-Drain Piping: 80 psig 150 deg F.
7. Air-Vent Piping: 80 psig at 200 deg F.
8. Safety-Valve-Inlet and -Outlet Piping: Equal to the pressure of the piping system to which it is attached.

2.2 COPPER TUBE AND FITTINGS

A. Drawn-Temper Copper Tubing: ASTM B 88, Type L.

B. Wrought-Copper Fittings: ASME B16.22.

1. 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:

a. Anvil International, Inc.
b. S. P. Fittings; a division of Star Pipe Products.
c. Victaulic Company of America.

C. Grooved, Mechanical-Joint, Wrought-Copper Fittings: ASME B16.22.

1. Grooved-End Copper Fittings: ASTM B 75, copper tube or ASTM B 584, bronze casting.

2. Grooved-End-Tube Couplings: Rigid pattern unless otherwise indicated; gasketed fitting. Ductile-iron housing with keys matching pipe and fitting grooves, pre-lubricated EPDM gasket rated for minimum 230 deg F for use with housing, and steel bolts and nuts.

D. Copper or Bronze Pressure-Seal Fittings:

1. Housing: Copper.
2. O-Rings and Pipe Stops: EPDM.
3. Tools: Manufacturer's special tools.
4. Minimum 200-psig working-pressure rating at 250 deg F.

E. Wrought-Copper Unions: ASME B16.22.

2.3 STEEL PIPE AND FITTINGS

A. Steel Pipe: ASTM A 53/A 53M, black steel with plain ends; welded and seamless, Grade B, and wall thickness as indicated in "Piping Applications" Article.

B. Cast-Iron Threaded Fittings: ASME B16.4; Classes 125 and 250 as indicated in "Piping Applications" Article.

C. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150 and 300 as indicated in "Piping Applications" Article.

D. Malleable-Iron Unions: ASME B16.39; Classes 150, 250, and 300 as indicated in "Piping Applications" Article.

E. Cast-Iron Pipe Flanges and Flanged Fittings: ASME B16.1, Classes 25, 125, and 250; raised ground face, and bolt holes spot faced as indicated in "Piping Applications" Article.

F. Wrought-Steel Fittings: ASTM A 234/A 234M, wall thickness to match adjoining pipe.

G. Wrought Cast- and Forged-Steel Flanges and Flanged Fittings: ASME B16.5, including bolts, nuts, and gaskets of the following material group, end connections, and facings:

1. Material Group: 1.1.
2. End Connections: Butt welding.
3. Facings: Raised face.

H. Grooved Mechanical-Joint Fittings and Couplings:

1. Grooved Mechanical-Joint Fittings and Couplings: Manufactured in two segments of cast ductile iron, conforming to ASTM A-536, Grade 65-45-12. Gaskets shall be pressure-responsive synthetic rubber, grade to suit the intended service, conforming to ASTM D-2000. Mechanical Coupling bolts shall be zinc plated heat treated carbon steel track head conforming to ASTM A-449 and, minimum tensile strength 110,000 psi.

a. Rigid Type: Coupling housings with offsetting, angle-pattern bolt pads shall be used to provide system rigidity and support and hanging in accordance with ANSI B31.1 Installation ready rigid coupling for direct stab installation without field disassembly. Gasket shall be Grade “EHP” EPDM compound with red and green color code designed for operating temperatures from -30° F to +250° F. Basis of design: Victaulic S/107N, S/W07

b. Flexible Type: Use in locations where vibration attenuation and thermal expansion compensation (including risers) are required. Installation ready flexible coupling for direct stab installation without field disassembly. Gasket shall be Grade “EHP” EPDM compound with red and green color code designed for operating temperatures from -30° F to +250° F. Basis of Design: Victaulic S/177N S/W77

2. Fittings: Cast of ductile iron conforming to ASTM A-536, Grade 65-45-12, provided with an alkyd enamel finish or hot dip galvanized to ASTM A-153. Factory-fabricated grooved end header all-in-one assembly for fluid distribution consists of an ASTM A53, Grade B, standard weight pipe spool with required outlet connections. Grooved ends roll grooved to Victaulic dimensions, with enamel coating.

I. Steel Pressure-Seal Fittings:

1. Housing: Steel.
2. O-Rings and Pipe Stop: EPDM.
3. Tools: Manufacturer's special tool.
4. Minimum 300-psig working-pressure rating at 230 deg F.

J. Steel Pipe Nipples: ASTM A 733, made of same materials and wall thicknesses as pipe in which they are installed.

2.4 JOINING MATERIALS

A. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.

1. ASME B16.21, nonmetallic, flat, asbestos free, 1/8-inch maximum thickness unless 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.

B. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

A. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

B. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

C. Gasket Material: Thickness, material, and type suitable for fluid to be handled and working temperatures and pressures.

2.5 DIELECTRIC FITTINGS

A. Description: Combination fitting of copper-alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.

B. Insulating Material: Suitable for system fluid, pressure, and temperature.

C. Dielectric Unions:

1. 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:

a. Capitol Manufacturing Company.
b. Hart Industries International, Inc.
c. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
d. Zurn Plumbing Products Group; AquaSpec Commercial Products Division.

2. Factory-fabricated union assembly, for 250-psig minimum working pressure at 180 deg F.

D. Dielectric Flanges:

1. 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:

a. Capitol Manufacturing Company.
b. Central Plastics Company.
c. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

2. Factory-fabricated companion-flange assembly, for 150- or 300-psig minimum working pressure as required to suit system pressures.

E. Dielectric-Flange Kits:

1. 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:

a. Advance Products & Systems, Inc.
b. Calpico, Inc.
c. Central Plastics Company.

2. Companion-flange assembly for field assembly. Include flanges, full-face- or ring-type neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.
3. Separate companion flanges and steel bolts and nuts shall have 150- or 300-psig minimum working pressure where required to suit system pressures.

F. Dielectric Couplings:

1. 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:

   a. Calpico, Inc.
   b. Lochinvar Corporation.

2. Galvanized-steel coupling with inert and noncorrosive thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg F.

G. Dielectric Nipples:

1. 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:

   a. Perfection Corporation; a subsidiary of American Meter Company.
   b. Sioux Chief Manufacturing Company, Inc.
   c. Victaulic Company of America.

2. Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg F.

2.6 VALVES

A. Check, Ball, and Butterfly Valves: Comply with requirements specified in Division 23 Section "General-Duty Valves for HVAC Piping."

B. Automatic Temperature-Control Valves, Actuators, and Sensors: Comply with requirements specified in Division 23 Section "Instrumentation and Control for HVAC."

C. Bronze, Calibrated-Orifice, Balancing Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Armstrong Pumps, Inc.
   b. Bell & Gossett Domestic Pump; a division of ITT Industries.
   c. Taco.

2. Body: Bronze, Y pattern equal percentage globe style designed for proportional balancing.

    a. Capable of precise flow measurement.
    b. Precision flow balancing.
    c. Positive shutoff with no-drip soft seat.

3. Ball: Brass or stainless steel.
4. Plug: Resin.
5. Seat: PTFE.
6. End Connections: Threaded or socket.
7. Pressure Gage Connections: Integral seals for portable differential pressure meter.

8. Handle Style: Handwheel, with memory stop to retain set position.
    a. Capable of four – 360 degree adjustment turns of the handwheel with a micrometer-type indicator and hidden memory feature with tamperproof setpoint.

9. CWP Rating: Minimum 125 psig.
10. Maximum Operating Temperature: 250 deg F.

2.7 AIR CONTROL DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Amtrol, Inc.
2. Armstrong Pumps, Inc.
3. Bell & Gossett Domestic Pump; a division of ITT Industries.
4. Taco.

B. Manual Air Vents:

1. Body: Bronze.
2. Internal Parts: Nonferrous.
3. Operator: Screwdriver or thumbscrew.
4. Inlet Connection: NPS 1/2.
5. Discharge Connection: NPS 1/8.
6. CWP Rating: 150 psig.
7. Maximum Operating Temperature: 225 deg F.

C. Automatic Air Vents:

1. Body: Bronze or cast iron.
2. Internal Parts: Nonferrous.
3. Operator: Noncorrosive metal float.
4. Inlet Connection: NPS 1/2 .
5. Discharge Connection: NPS 1/4 .

6. CWP Rating: 150 psig .
7. Maximum Operating Temperature: 240 deg F .

D. Diaphragm or Bladder-Type Expansion Tanks:

1. Tank: Welded steel, rated for 125-psig working pressure and 375 deg F) maximum operating temperature. Factory test after taps are fabricated and supports installed and are labeled according to ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
2. Diaphragm or Bladder: Securely sealed into tank to separate air charge from system water to maintain required expansion capacity.
3. Air-Charge Fittings: Schrader valve, stainless steel with EPDM seats.

E. Tangential-Type Air Separators:

1. Tank: Welded steel; ASME constructed and labeled for 125-psig minimum working pressure and 375 deg F maximum operating temperature.
2. Air Collector Tube: Perforated stainless steel, constructed to direct released air into expansion tank.
3. Tangential Inlet and Outlet Connections: Threaded for NPS 2 and smaller; flanged connections for NPS 2-1/2 and larger.
4. Blowdown Connection: Threaded.
5. Size: Match system flow capacity.

2.8 HYDRONIC PIPING SPECIALTIES

A. Y-Pattern Strainers:

1. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.
2. End Connections: Threaded ends for NPS 2 and smaller; flanged ends for NPS 2-1/2 and larger.
3. Strainer Screen: 40-mesh startup strainer, and perforated stainless-steel basket with 50 percent free area.
4. CWP Rating: 125 psig.

2.9 Bypass Chemical Feeder

A. Description: Welded steel construction; 125-psig working pressure; 5-gal. capacity; with fill funnel and inlet, outlet, and drain valves.

1. Chemicals: Specially formulated, based on analysis of makeup water, to prevent accumulation of scale and corrosion in piping and connected equipment.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

A. Hot-water, chilled water, and dual-temperature piping, aboveground, NPS 2 and smaller, shall be any of the following:

1. Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered or pressure-seal joints.

B. Hot-water, chilled water, and dual-temperature piping, aboveground, NPS 2-1/2 and larger, shall be any of the following:

1. Type L, drawn-temper copper tubing, wrought-copper fittings, and brazed joints.
2. Schedule 40 steel pipe, wrought-steel fittings and wrought-cast or forged-steel flanges and flange fittings, and welded and flanged joints.
3. Schedule 40 steel pipe; grooved, mechanical joint coupling and fittings; and grooved, mechanical joints.

C. Makeup-water piping installed aboveground shall be the following:

1. Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.

D. Cooling Unit Condensate-Drain Piping: Type DWV, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.

E. Air-Vent Piping:

1. Inlet: Same as service where installed with metal-to-plastic transition fittings for plastic piping systems according to the piping manufacturer's written instructions.
2. Outlet: Type K, annealed-temper copper tubing with soldered or flared joints.

F. Safety-Valve-Inlet and -Outlet Piping for Hot-Water Piping: Same materials and joining methods as for piping specified for the service in which safety valve is installed.

3.2 VALVE APPLICATIONS

A. Install shutoff-duty valves at each branch connection to supply mains, and at supply connection to each piece of equipment.

B. Install calibrated-orifice, balancing valves in the return pipe of each heating or cooling terminal. Provide additional calibrated-orifice balancing valves as shown on drawings.

3.3 PIPING INSTALLATIONS

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicate piping locations and arrangements if such were used to size

pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

B. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.

C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

E. Install piping to permit valve servicing.

F. Install piping at indicated slopes.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Install piping to allow application of insulation.

J. Select system components with pressure rating equal to or greater than system operating pressure.

K. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.

L. Install drains, consisting of a tee fitting**,** NPS 3/4 ball valve, and short NPS 3/4 threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.

M. Install piping at a uniform grade of 0.2 percent upward in direction of flow.

N. Reduce pipe sizes using eccentric reducer fitting installed with level side up.

O. Install branch connections to mains using tee fittings in main pipe, with the branch connected to the bottom of the main pipe. For up-feed risers, connect the branch to the top of the main pipe.

P. Install valves according to Division 23 Section "General-Duty Valves for HVAC Piping."

Q. Install unions in piping**,** NPS 2 and smaller, adjacent to valves, at final connections of equipment, and elsewhere as indicated.

R. Install strainers on inlet side of each control valve, pressure-reducing valve, solenoid valve, in-line pump, and elsewhere as indicated. Install NPS 3/4 nipple and ball valve

in blowdown connection of strainers NPS 2 and larger. Match size of strainer blowoff connection for strainers smaller than NPS 2.

S. Identify piping as specified in Division 23 Section "Identification for HVAC Piping and Equipment."

T. Install sleeve seals for piping penetrations of concrete walls and slabs.

U. Install escutcheons for piping penetrations of walls, ceilings, and floors.

3.4 DIELECTRIC FITTING INSTALLATION

A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

B. Dielectric Fittings for NPS 2 and Smaller: Use dielectric unions.

C. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric flanges nipples.

D. Dielectric Fittings for NPS 5 and Larger: Use dielectric flange kits.

3.5 HANGERS AND SUPPORTS

A. Hanger, support, and anchor devices are specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment." Comply with the following requirements for maximum spacing of supports.

B. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal piping less than 20 feet long.
2. Adjustable roller hangers and spring hangers for individual horizontal piping 20 feet or longer.
3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet or longer, supported on a trapeze.
4. Spring hangers to support vertical runs.
5. Provide copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.

C. Install hangers for steel piping with the following maximum spacing and minimum rod sizes:

1. NPS 3/4: Maximum span, 7 feet; minimum rod size, 1/4 inch.
2. NPS 1: Maximum span, 7 feet; minimum rod size, 1/4 inch.
3. NPS 1-1/2: Maximum span, 9 feet; minimum rod size, 3/8 inch.
4. NPS 2: Maximum span, 10 feet; minimum rod size, 3/8 inch.
5. NPS 3 and Larger: Maximum span 12 feet, minimum rod size 3/8”.

D. Install hangers for drawn-temper copper piping with the following maximum spacing and minimum rod sizes:

1. NPS 3/4: Maximum span, 5 feet; minimum rod size, 1/4 inch.
2. NPS 1: Maximum span, 6 feet; minimum rod size, 1/4 inch.
3. NPS 1-1/2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
4. NPS 2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
5. NPS 3 and Larger: Maximum span 10 feet, minimum rod size 3/8”.

E. Support vertical runs at roof, at each floor, and at 10-foot intervals between floors.

3.6 PIPE JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

E. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.

F. 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 ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

G. Grooved Joints: Pipe ends shall be clean and free from indentations, projections and roll marks in the area from pipe end to groove for proper gasket sealing. The gasket style and elastomeric material shall be verified as suitable for the intended service as specified. Flexible couplings only to be used for expansion loops, pump trim and where approved by the engineer. A factory trained representative shall provide on-site training for contractor’s field personnel in the use of grooving tools, application of groove, and product installation. All groove depths shall be checked manually or by grooving tool (RG5200i). A certified representative for the grooved pipe manufacturer shall periodically visit the job site and review installation

H. Pressure-Sealed Joints: Use manufacturer-recommended tool and procedure. Leave insertion marks on pipe after assembly.

3.7 HYDRONIC SPECIALTIES INSTALLATION

A. Install manual air vents at high points in piping, at heat-transfer coils, and elsewhere as required for system air venting.

B. Install automatic air vents at high points of system piping in mechanical equipment rooms only. Manual vents at heat-transfer coils and elsewhere as required for air venting.

3.8 TERMINAL EQUIPMENT CONNECTIONS

A. Sizes for supply and return piping connections shall be the same as or larger than equipment connections.

B. Install control valves in accessible locations close to connected equipment.

C. Install bypass piping with globe valve around control valve. If parallel control valves are installed, only one bypass is required.

D. Install ports for pressure gages and thermometers at coil inlet and outlet connections according to Division 23 Section "Meters and Gages for HVAC Piping."

3.9 SYSTEM FILL

A. For all glycol-water systems, contractor shall be responsible for the initial system fill with a pre-mixed glycol solution as follows:

1. 30% propylene glycol-water mixture by volume with corrosion inhibitors similar to DOWFROST HD
    a. Temperature range from -50 deg F to 325 deg F.
    b. Fluorescent dye for leak protections.

3.10 CHEMICAL TREATMENT

A. Perform an analysis of makeup water to determine type and quantities of chemical treatment needed to keep system free of scale, corrosion, and fouling, and to sustain the following water characteristics:

1. pH: 9.0 to 10.5.
2. "P" Alkalinity: 100 to 500 ppm.
3. Boron: 100 to 200 ppm.
4. Chemical Oxygen Demand: Maximum of 100 ppm. Revise this value if closed system contains glycol.
5. Corrosion Inhibitor:

a. Sodium Nitrate: 1000 to 1500 ppm.
b. Molybdate: 200 to 300 ppm.
c. Chromate: 200 to 300 ppm.
d. Sodium Nitrate Plus Molybdate: 100 to 200 ppm each.
e. Chromate Plus Molybdate: 50 to 100 ppm each.

6. Soluble Copper: Maximum of 0.20 ppm.
7. Tolyiriazole Copper and Yellow Metal Corrosion Inhibitor: Minimum of 10 ppm.
8. Total Suspended Solids: Maximum of 10 ppm.
9. Ammonia: Maximum of 20 ppm.
10. Free Caustic Alkalinity: Maximum of 20 ppm.
11. Microbiological Limits:

a. Total Aerobic Plate Count: Maximum of 1000 organisms/mL.
b. Total Anaerobic Plate Count: Maximum of 100 organisms/mL.
c. Nitrate Reducers: [**100**] organisms/mL.
d. Sulfate Reducers: Maximum of zero organisms/mL.
e. Iron Bacteria: Maximum of zero organisms/mL.

B. Install bypass chemical feeders in each hydronic system where indicated.

1. Install in upright position with top of funnel not more than 48 inches above the floor.
2. Install feeder in minimum NPS 3/4 bypass line, from main with full-size, full-port, ball valve in the main between bypass connections.
3. Install NPS 3/4 pipe from chemical feeder drain to nearest equipment drain and include a full-size, full-port, ball valve.

C. Fill system with fresh water and add liquid alkaline compound with emulsifying agents and detergents to remove grease and petroleum products from piping. Circulate solution for a minimum of 24 hours, drain, clean strainer screens, and refill with fresh water.

D. Add initial chemical treatment and maintain water quality in ranges noted above for the first year of operation.

E. Fill systems with water or glycol solution as indicated.

3.11 FIELD QUALITY CONTROL

A. Prepare hydronic piping according to ASME B31.9 and as follows:

1. Leave joints, including welds, uninsulated and exposed for examination during test.
2. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.

3. Flush hydronic piping systems with clean water; then remove and clean or replace strainer screens.
4. Isolate equipment from piping. If a valve is used to isolate equipment, its closure shall be capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
5. Install safety valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.

B. Perform the following tests on hydronic piping:

1. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
2. While filling system, use vents installed at high points of system to release air. Use drains installed at low points for complete draining of test liquid.
3. Isolate expansion tanks and determine that hydronic system is full of water.
4. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the system's working pressure. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength or 1.7 times the "SE" value in Appendix A in ASME B31.9, "Building Services Piping."
5. After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
6. Prepare written report of testing.

C. Perform the following before operating the system:

1. Open manual valves fully.
2. Inspect pumps for proper rotation.
3. Set makeup pressure-reducing valves for required system pressure.
4. Inspect air vents at high points of system and determine if all are installed and operating freely (automatic type), or bleed air completely (manual type).
5. Set temperature controls so all coils are calling for full flow.
6. Inspect and set operating temperatures of hydronic equipment to specified values.
7. Verify lubrication of motors and bearings.

END OF SECTION 232113

SECTION 232300 - REFRIGERANT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Refrigerant pipes and fittings.
2. Refrigerant piping valves and specialties.
3. Refrigerants.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of valve, refrigerant piping, and piping specialty.

1. Include pressure drop, based on manufacturer's test data, for the following:

a. Service valves.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For refrigerant valves and piping specialties to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Comply with ASHRAE 15, "Safety Code for Refrigeration Systems."

B. Comply with ASME B31.5, "Refrigeration Piping and Heat Transfer Components."

1.6 PRODUCT STORAGE AND HANDLING

A. Store piping with end caps in place to ensure that piping interior and exterior are clean when installed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Line Test Pressure for Refrigerant R-410A:

1. Suction Lines for Air-Conditioning Applications: 300 psig.
2. Suction Lines for Heat-Pump Applications: 535 psig.
3. Hot-Gas and Liquid Lines: 535 psig.

2.2 COPPER TUBE AND FITTINGS

A. Copper Tube: ASTM B 280, Type ACR .

B. Wrought-Copper Fittings: ASME B16.22.

C. Wrought-Copper Unions: ASME B16.22.

D. Brazing Filler Metals: AWS A5.8/A5.8M.

E. Flexible Connectors:

1. Body: Tin-bronze bellows with woven, flexible, tinned-bronze-wire-reinforced protective jacket.
2. End Connections: Socket ends.
3. Offset Performance: Capable of minimum 3/4-inch misalignment in minimum 7-inch-long assembly.
4. Working Pressure Rating: Factory test at minimum 500 psig.
5. Maximum Operating Temperature: 250 deg F.

2.3 VALVES AND SPECIALTIES

A. Service Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Danfoss Inc.
b. Emerson Climate Technologies.
c. Paul Mueller Company.

2. Body: Forged brass with brass cap including key end to remove core.

3. Core: Removable ball-type check valve with stainless-steel spring.
4. Seat: Polytetrafluoroethylene.
5. End Connections: Copper spring.

6. Working Pressure Rating: 500 psig.

2.4 REFRIGERANTS

A. ASHRAE 34, R-410A: Pentafluoroethane/Difluoromethane.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Arkema Inc.
b. DuPont Fluorochemicals Div.
c. Genetron Refrigerants; Honeywell International Inc.
d. Mexichem Fluor Inc.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS FOR REFRIGERANT R-410A

A. Suction Lines NPS 1-1/2 and Smaller for Conventional Air-Conditioning Applications: Copper, Type ACR drawn or annealed tubing and wrought-copper fittings with brazed joints.

B. Hot-Gas and Liquid Lines: Copper, Type ACR drawn or annealed tubing and wrought-copper fittings with brazed joints.

3.2 VALVE AND SPECIALTY APPLICATIONS

A. Install service valves for gage taps at inlet and outlet of hot-gas bypass valves and strainers if they are not an integral part of valves and strainers.

B. Install flexible connectors at compressors.

3.3 PIPING INSTALLATION

A. Drawing 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 unless deviations to layout are approved on Shop Drawings.

B. Install refrigerant piping according to ASHRAE 15.

C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping adjacent to machines to allow service and maintenance.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Select system components with pressure rating equal to or greater than system operating pressure.

J. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.

K. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection.

L. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.

M. Slope refrigerant piping as follows:

1. Install horizontal hot-gas discharge piping with a uniform slope downward away from compressor.
2. Install horizontal suction lines with a uniform slope downward to compressor.
3. Install traps and double risers to entrain oil in vertical runs.
4. Liquid lines may be installed level.

N. When brazing, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.

O. Before installation of steel refrigerant piping, clean pipe and fittings using the following procedures:

1. Shot blast the interior of piping.
2. Remove coarse particles of dirt and dust by drawing a clean, lintless cloth through tubing by means of a wire or electrician's tape.
3. Draw a clean, lintless cloth saturated with trichloroethylene through the tube or pipe. Continue this procedure until cloth is not discolored by dirt.
4. Draw a clean, lintless cloth, saturated with compressor oil, squeezed dry, through the tube or pipe to remove remaining lint. Inspect tube or pipe visually for remaining dirt and lint.
5. Finally, draw a clean, dry, lintless cloth through the tube or pipe.

6. Safety-relief-valve discharge piping is not required to be cleaned but is required to be open to allow unrestricted flow.

P. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.

Q. Identify refrigerant piping and valves according to Section 230553 "Identification for HVAC Piping and Equipment."

R. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."

S. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."

T. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 230518 "Escutcheons for HVAC Piping."

U. See Section 238129 Variable-Refrigerant-Flow HVAC Systems for additional requirements.

3.4 PIPE JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Fill pipe and fittings with an inert gas (nitrogen or carbon dioxide), during brazing or welding, to prevent scale formation.

D. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."

1. Use Type BCuP (copper-phosphorus) alloy for joining copper socket fittings with copper pipe.
2. Use Type BAg (cadmium-free silver) alloy for joining copper with bronze or steel.

E. See Section 238129 Variable-Refrigerant-Flow HVAC Systems for additional requirements.

3.5 HANGERS AND SUPPORTS

A. Comply with requirements for pipe hangers and supports specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."

B. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal runs less than 20 feet long.
2. Roller hangers and spring hangers for individual horizontal runs 20 feet or longer.
3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet or longer, supported on a trapeze.
4. Spring hangers to support vertical runs.
5. Copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.

C. Install hangers for copper tubing with the following maximum spacing and minimum rod diameters:

1. NPS 1/2: Maximum span, 60 inches; minimum rod, 1/4 inch.
2. NPS 5/8: Maximum span, 60 inches; minimum rod, 1/4 inch.
3. NPS 1: Maximum span, 72 inches; minimum rod, 1/4 inch.
4. NPS 1-1/4: Maximum span, 96 inches; minimum rod, 3/8 inch.
5. NPS 1-1/2: Maximum span, 96 inches; minimum rod, 3/8 inch.

D. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 2: Maximum span, 10 feet; minimum rod, 3/8 inch.

E. Support multifloor vertical runs at least at each floor.

3.6 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Comply with ASME B31.5, Chapter VI.
2. Test refrigerant piping, specialties, and receivers. Isolate compressor, condenser, evaporator, and safety devices from test pressure if they are not rated above the test pressure.
3. Test high- and low-pressure side piping of each system separately at not less than the pressures indicated in "Performance Requirements" Article.
    a. Fill system with nitrogen to the required test pressure.
    b. System shall maintain test pressure at the manifold gage throughout duration of test.
    c. Test joints and fittings with electronic leak detector or by brushing a small amount of soap and glycerin solution over joints.
    d. Remake leaking joints using new materials, and retest until satisfactory results are achieved.

B. Prepare test and inspection reports.

3.7 SYSTEM CHARGING

A. Charge system using the following procedures:

1. Evacuate entire refrigerant system with a vacuum pump to 500 micrometers. If vacuum holds for 12 hours, system is ready for charging.
2. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig.
3. Charge system with a new filter-dryer core in charging line.

3.8 ADJUSTING

A. Adjust high- and low-pressure switch settings to avoid short cycling in response to fluctuating suction pressure.

B. Adjust set-point temperature of air-conditioning controllers to the system design temperature.

C. Perform the following adjustments before operating the refrigeration system, according to manufacturer's written instructions:

1. Verify that compressor oil level is correct.
2. Open refrigerant valves except bypass valves that are used for other purposes.

END OF SECTION 232300

SECTION 233113 - METAL DUCTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Single-wall rectangular ducts and fittings.
2. Single-wall round ducts and fittings.
3. Sheet metal materials.
4. Sealants and gaskets.
5. Hangers and supports.

1.3 SUBMITTALS

A. Product Data: For each type of the following products:

1. Sealants and gaskets.

B. Shop Drawings:

1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
2. Factory- and shop-fabricated ducts and fittings.
3. Elevation of top of ducts.
4. Fittings.
5. Seam and joint construction.
6. Hangers and supports, including methods for duct and building attachment and vibration isolation.

1.4 QUALITY ASSURANCE

A. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-Up."

B. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6.4.4 - "HVAC System Construction and Insulation."

C. Comply with the Mechanical Code of New York State.

D. Comply with the Energy Conservation Code of New York State.

PART 2 - PRODUCTS

2.1 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-4, "Transverse (Girth) Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-5, "Longitudinal Seams - Rectangular Ducts," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 2, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.2 SINGLE-WALL ROUND DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Lindab Inc.
b. McGill AirFlow LLC.
c. SEMCO Incorporated.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Transverse Joints - Round Duct," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Seams - Round Duct and Fittings," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.3 SHEET METAL MATERIALS

A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G90.
2. Finishes for Surfaces Exposed to View: Mill phosphatized.

C. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.

D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.4 SEALANT AND GASKETS

A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.

B. Two-Part Tape Sealing System:
1. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
3. Sealant: Modified styrene acrylic.
4. Water resistant.
5. Mold and mildew resistant.
6. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
7. Service: Indoor and outdoor.
8. Service Temperature: Minus 40 to plus 200 deg F.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.

C. Water-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Solids Content: Minimum 65 percent.
3. Shore A Hardness: Minimum 20.
4. Water resistant.
5. Mold and mildew resistant.
6. VOC: Maximum 75 g/L (less water).
7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
8. Service: Indoor or outdoor.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Solvent-Based Joint and Seam Sealant:
1. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Application Method: Brush on.
3. Base: Synthetic rubber resin.
4. Solvent: Toluene and heptane.
5. Solids Content: Minimum 60 percent.
6. Shore A Hardness: Minimum 60.
7. Water resistant.
8. Mold and mildew resistant.
9. Service: Indoor or outdoor.
10. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

E. Flanged Joint Sealant: Comply with ASTM C 920.

1. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. General: Single-component, acid-curing, silicone, elastomeric.
3. Type: S.
4. Grade: NS.
5. Class: 25.
6. Use: O.

F. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

2.5 HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.

B. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1, "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct."

C. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.

D. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.

E. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.

B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

C. Install ducts with fewest possible joints.

D. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.

E. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.

F. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

G. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.

H. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "Duct Cleanliness for New Construction Guidelines."

3.2 DUCT SEALING

A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":

1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
2. Boiler Room, Outside-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class B.

3.3 HANGER AND SUPPORT INSTALLATION

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Hangers and Supports."

B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.

1. Where practical, install concrete inserts before placing concrete.
2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.

C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1, "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.

D. Hangers Exposed to View: Threaded rod and angle or channel supports.

E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.

F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.4 CONNECTIONS

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.5 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Leakage Tests:

1. Comply with SMACNA's "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.
2. Test the following systems:

    a. Outdoor Air Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections, selected by Architect from sections installed, totaling no less than 50 percent of total installed duct area for each designated pressure class.

3. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
4. Test for leaks before applying external insulation.
5. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure.
6. Give seven days' advance notice for testing.

C. Duct System Cleanliness Tests:

1. Visually inspect duct system to ensure that no visible contaminants are present.

D. Duct system will be considered defective if it does not pass inspections.

E. Duct cleaning as specified below will be required if duct system does not pass cleanliness tests. Cleanliness tests will be repeated until acceptable cleanliness levels are achieved.

F. Prepare test and inspection reports.

3.6 DUCT CLEANING

A. Duct cleaning will be required only if duct system cleanliness tests are failed.

B. Clean new duct system(s) before testing, adjusting, and balancing.

C. Use service openings for entry and inspection.

D. Clean the following components by removing surface contaminants and deposits:

1. Louvers
2. Outside-air ducts and turning vanes.

3.7 DUCT SCHEDULE

A. Fabricate ducts with galvanized sheet steel.

B. Indoor Supply, Return, Exhaust, and Outside Air Ducts:

1. Provide the following:

    a. Pressure Class: Positive or negative up to 2-inch wg.
    b. SMACNA Leakage Class for Rectangular: 16.
    c. SMACNA Leakage Class for Round: 8.

C. Intermediate Reinforcement:

1. Galvanized-Steel Ducts: Galvanized steel.

D. Elbow Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Elbows."

    a. Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
    b. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-3, "Vanes and Vane Runners," and Figure 2-4, "Vane Support in Elbows."

2. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-3, "Round Duct Elbows."

    a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.

        1) Radius-to Diameter Ratio: 1.5.

    b. Round Elbows, 12 Inches and Smaller in Diameter: Stamped or pleated.
    c. Round Elbows, 14 Inches and Larger in Diameter: Standing seam.

END OF SECTION 233113

SECTION 233300 - AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Manual volume dampers.
2. Control dampers.
3. Flange connectors.
4. Duct silencers.
5. Turning vanes.
6. Flexible connectors.
7. Duct accessory hardware.
8. Duct mounted access doors
9. Fire dampers.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. For duct silencers, include pressure drop and dynamic insertion loss data. Include breakout noise calculations for high transmission loss casings.

B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work.

1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:

a. Special fittings.
b. Manual volume damper installations.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For air duct accessories to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTION

A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

2.2 MATERIALS

A. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G60.
2. Exposed-Surface Finish: Mill phosphatized.

B. Aluminum Sheets: Comply with ASTM B 209, Alloy 3003, Temper H14; with mill finish for concealed ducts and standard, 1-side bright finish for exposed ducts.

C. Extruded Aluminum: Comply with ASTM B 221, Alloy 6063, Temper T6.

D. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

E. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.3 MANUAL VOLUME DAMPERS

A. Standard, Steel, Manual Volume Dampers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. American Warming and Ventilating; a Mestek Architectural Group company.

b. McGill AirFlow LLC.
c. Nailor Industries Inc.
d. Ruskin Company.
e. Vent Products Co., Inc.

2. Standard leakage rating, with linkage outside airstream.

3. Suitable for horizontal or vertical applications.
4. Frames:

a. Frame: Hat-shaped, 0.094-inch-thick, galvanized sheet steel.
b. Mitered and welded corners.
c. Flanges for attaching to walls and flangeless frames for installing in ducts.

5. Blades:

a. Multiple or single blade.
b. Parallel- or opposed-blade design.
c. Stiffen damper blades for stability.
d. Galvanized-steel, 0.064 inch thick.

6. Blade Axles: Galvanized steel.
7. Bearings:

a. Oil-impregnated bronze.
b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.

8. Tie Bars and Brackets: Galvanized steel.

2.4 CONTROL DAMPERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. American Warming and Ventilating; a Mestek Architectural Group company.
2. Arrow United Industries.
3. Greenheck Fan Corporation.
4. McGill AirFlow LLC.
5. Nailor Industries Inc.
6. Ruskin Company.

B. Low-leakage rating, with linkage outside airstream, and bearing AMCA's Certified Ratings Seal for both air performance and air leakage.

C. Frames:

1. Hat shaped.
2. 0.094-inch-thick, galvanized sheet steel.
3. Mitered and welded corners.

D. Blades:

1. Multiple blade with maximum blade width of 6 inches.
2. Parallel-blade design.
3. Galvanized-steel.
4. 0.064 inch thick single skin or 0.0747-inch-thick dual skin.
5. Blade Edging: Closed-cell neoprene.
6. Blade Edging: Inflatable seal blade edging, or replaceable rubber seals.

E. Blade Axles: 1/2-inch-diameter; galvanized steel; blade-linkage hardware of zinc-plated steel and brass; ends sealed against blade bearings.

1. Operating Temperature Range: From minus 40 to plus 200 deg F.

F. Bearings:

1. Oil-impregnated bronze.
2. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
3. Thrust bearings at each end of every blade.

2.5 FLANGE CONNECTORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Ductmate Industries, Inc.
2. Elgen Manufacturing.
3. Hardcast, Inc.
4. Ward Industries; a brand of Hart & Cooley, Inc.

B. Description: Add-on or roll-formed, factory-fabricated, slide-on transverse flange connectors, gaskets, and components.

C. Material: Galvanized steel.

D. Gage and Shape: Match connecting ductwork.

2.6 DUCT SILENCERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. McGill AirFlow LLC.
2. Price Noise Control.
3. Ruskin Company.
4. Vibro-Acoustics.

B. General Requirements:

1. Factory fabricated.
2. Fire-Performance Characteristics: Adhesives, sealants, packing materials, and accessory materials shall have flame-spread index not exceeding 25 and smoke-developed index not exceeding 50 when tested according to ASTM E 84.
3. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

C. Shape:

1. Rectangular straight with splitters or baffles.
2. Round straight with center bodies or pods.
3. Rectangular elbow with splitters or baffles.
4. U or Z shaped with baffels.
5. Rectangular transitional with splitters or baffles.

D. Rectangular Silencer Outer Casing: ASTM A 653/A 653M, G90, galvanized sheet steel, 0.034 inch thick.

E. Inner Casing and Baffles: ASTM A 653/A 653M, G90 galvanized sheet metal, 0.034 inch thick, and with 1/8-inch-diameter perforations.

F. Special Construction:

1. High transmission loss to achieve STC 45.

G. Connection Sizes: Match connecting ductwork unless otherwise indicated.

H. Principal Sound-Absorbing Mechanism:

1. Controlled impedance membranes and broadly tuned resonators without absorptive media.
2. Dissipative type with fill material.

    a. Fill Material: Moisture-proof nonfibrous material.
    b. Erosion Barrier: Polymer bag enclosing fill, and heat sealed before assembly.

3. Lining: Mylar or Tedlar.

I. Fabricate silencers to form rigid units that will not pulsate, vibrate, rattle, or otherwise react to system pressure variations. Do not use mechanical fasteners for unit assemblies.

1. Joints: continuously welded or flanged connections.
2. Suspended Units: Factory-installed suspension hooks or lugs attached to frame in quantities and spaced to prevent deflection or distortion.
3. Reinforcement: Cross or trapeze angles for rigid suspension.

J. Source Quality Control: Test according to ASTM E 477.

1. Record acoustic ratings, including dynamic insertion loss and generated-noise power levels with an airflow of at least 2000-fpm face velocity.
2. Leak Test: Test units for airtightness at 200 percent of associated fan static pressure or 6-inch wg static pressure, whichever is greater.

2.7 TURNING VANES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Aero-Dyne Sound Control Co.
2. Ductmate Industries, Inc.
3. Duro Dyne Inc.
4. Elgen Manufacturing.

B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.

1. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.

C. Manufactured Turning Vanes for Nonmetal Ducts: Fabricate curved blades of resin-bonded fiberglass with acrylic polymer coating; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.

D. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 4-3, "Vanes and Vane Runners," and 4-4, "Vane Support in Elbows."

E. Vane Construction: Single wall for ducts up to 48 inches wide and double wall for larger dimensions.

2.8 FLEXIBLE CONNECTORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Ductmate Industries, Inc.

2. Duro Dyne Inc.
3. Elgen Manufacturing.
4. Ventfabrics, Inc.

B. Materials: Flame-retardant or noncombustible fabrics.

C. Coatings and Adhesives: Comply with UL 181, Class 1.

D. Metal-Edged Connectors: Factory fabricated with a fabric strip 3-1/2 inches wide attached to two strips of 2-3/4-inch-wide, 0.028-inch-thick, galvanized sheet steel or 0.032-inch-thick aluminum sheets. Provide metal compatible with connected ducts.

E. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.

1. Minimum Weight: 26 oz./sq. yd..
2. Tensile Strength: 480 lbf/inch in the warp and 360 lbf/inch in the filling.
3. Service Temperature: Minus 40 to plus 200 deg F.

F. Outdoor System, Flexible Connector Fabric: Glass fabric double coated with weatherproof, synthetic rubber resistant to UV rays and ozone.

1. Minimum Weight: 24 oz./sq. yd..
2. Tensile Strength: 530 lbf/inch in the warp and 440 lbf/inch in the filling.
3. Service Temperature: Minus 50 to plus 250 deg F.

G. Thrust Limits: Combination coil spring and elastomeric insert with spring and insert in compression, and with a load stop. Include rod and angle-iron brackets for attaching to fan discharge and duct.

1. Frame: Steel, fabricated for connection to threaded rods and to allow for a maximum of 30 degrees of angular rod misalignment without binding or reducing isolation efficiency.
2. Outdoor Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
6. Elastomeric Element: Molded, oil-resistant rubber or neoprene.
7. Coil Spring: Factory set and field adjustable for a maximum of 1/4-inch movement at start and stop.

2.9 DUCT ACCESSORY HARDWARE

A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.

B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

2.10 DUCT-MOUNTED ACCESS DOORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Air Balance Inc.; a division of Mestek, Inc.
2. METALAIRE, Inc.
3. Nailor Industries Inc.
4. Ruskin Company.

B. Duct-Mounted Access Doors: Fabricate access panels according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 7-2, "Duct Access Doors and Panels," and 7-3, "Access Doors - Round Duct."

1. Door:
   a. Double wall, rectangular.
   b. Galvanized sheet metal with insulation fill and thickness as indicated for duct pressure class.
   c. Hinges and Latches: 1-by-1-inchbutt or piano hinge and cam latches.
   d. Fabricate doors airtight and suitable for duct pressure class.
2. Frame: Galvanized sheet steel, with bend-over tabs and foam gaskets.
3. Number of Hinges and Locks:
   a. Access Doors Less Than 12 Inches Square: No hinges and two sash locks.
   b. Access Doors up to 18 Inches Square: Continuous and two sash locks.

2.11 FIRE DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Greenheck Fan Corporation.
2. NCA Manufacturing, Inc.
3. Ruskin Company.

B. Type: dynamic; rated and labeled according to UL 555 by an NRTL.

C. Closing rating in ducts up to 4-in ch wg static pressure class and minimum 2000-fpm velocity.

D. Fire Rating: 1-1/2 hours.

E. Frame: Curtain type with blades outside airstream; fabricated with roll-formed galvanized steel; with mitered and interlocking corners; gauge in accordance with UL listing.

F. Mounting Sleeve: Factory- or field-installed, galvanized sheet steel; gauge in accordance with UL listing.

G. Mounting Orientation: Vertical or horizontal as indicated.

H. Blades: Roll-formed, interlocking, galvanized sheet steel; gauge in accordance with UL listing.

I. Horizontal Dampers: Include blade lock and stainless-steel closure spring.

J. Heat-Responsive Device: Replaceable, 165 deg F rated, fusible links.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.

B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.

C. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.

1. Install steel volume dampers in steel ducts.
2. Install aluminum volume dampers in aluminum ducts.

D. Set dampers to fully open position before testing, adjusting, and balancing.

E. Install test holes at fan inlets and outlets and elsewhere as indicated.

F. Install flexible connectors to connect ducts to equipment.

G. Connect flexible ducts to metal ducts with adhesive plus sheet metal screws.

H. Install duct test holes where required for testing and balancing purposes.

I. Install fire dampers according to UL listing.

J. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:

1. On both sides of duct coils.
2. Upstream from duct filters.
3. At outdoor-air intakes and mixed-air plenums.
4. At drain pans and seals.

5. Downstream from manual volume dampers, control dampers, backdraft dampers, and equipment.
6. Adjacent to and close enough to fire or smoke dampers, to reset or reinstall fusible links. Access doors for access to fire or smoke dampers having fusible links shall be pressure relief access doors and shall be outward operation for access doors installed upstream from dampers and inward operation for access doors installed downstream from dampers.
7. Control devices requiring inspection.
8. Elsewhere as indicated.

K. Install access doors with swing against duct static pressure.

L. Access Door Sizes:

1. One-Hand or Inspection Access: 8 by 5 inches
2. Two-Hand Access: 12 by 6 inches
3. Head and Hand Access: 18 by 10 inches
4. Head and Shoulders Access: 21 by 14 inches
5. Body Access: 25 by 14 inches
6. Body plus Ladder Access: 25 by 17 inches Coordinate first paragraph below with Section 230553 "Identification for HVAC Piping and Equipment."

M. Label access doors according to Section 230553 "Identification for HVAC Piping and Equipment" to indicate the purpose of access door.

3.2 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Operate dampers to verify full range of movement.
2. Inspect turning vanes for proper and secure installation.
3. Operate fire, smoke, and combination fire and smoke dampers to verify full range of movement and verify that proper heat-response device is installed.

END OF SECTION 233300

SECTION 233416 - CENTRIFUGAL HVAC FANS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes: For each product.

1. Centrifugal roof ventilators.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. Also include the following:

1. Certified fan performance curves with system operating conditions indicated.
2. Certified fan sound-power ratings.
3. Motor ratings and electrical characteristics, plus motor and electrical accessories.
4. Material thickness and finishes, including color charts.
5. Fan speed controllers.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Show fan room layout and relationships between components and adjacent structural and mechanical elements. Indicate and certify field measurements.

1. Roof framing and support members relative to duct penetrations.

B. Field quality-control reports.

A. Operation and Maintenance Data: For power ventilators to include in emergency, operation, and maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Belts: One set(s) for each belt-driven unit.

1.6 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. AMCA Compliance: Fans shall have AMCA-Certified performance ratings and shall bear the AMCA-Certified Ratings Seal.

1.7 COORDINATION

A. Coordinate size and location of structural-steel support members.

B. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

PART 2 - PRODUCTS

2.1 CENTRIFUGAL ROOF VENTILATORS

A. Housing: Removable, spun-aluminum, dome top and outlet baffle; square, one-piece, aluminum base with venturi inlet cone.

1. Hinged Subbase: Galvanized-steel hinged arrangement permitting service and maintenance.

B. Fan Wheels: Aluminum hub and wheel with backward-inclined blades.

C. Belt Drives:

1. Resiliently mounted to housing.
2. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.
3. Shaft Bearings: Permanently lubricated, permanently sealed, self-aligning ball bearings.
4. Pulleys: Cast-iron, adjustable-pitch motor pulley.
5. Fan and motor isolated from exhaust airstream.

D. Accessories:

1. Variable-Speed Controller: Solid-state control to reduce speed from 100 to less than 50 percent.
2. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted outside fan housing, factory wired through an internal aluminum conduit.
3. Bird Screens: Removable, 1/2-inch mesh, aluminum or brass wire.
4. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in curb base; factory set to close when fan stops.

E. Capacities and Characteristics: See Drawings.

2.2 MOTORS

A. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Section 230513 "Common Motor Requirements for HVAC Equipment."

1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

B. Enclosure Type: Open, drip-proof.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install centrifugal fans level and plumb.

B. Secure roof-mounted fans to roof curbs with cadmium-plated hardware.

C. Install units with clearances for service and maintenance.

D. Label units according to requirements specified in Section 230553 "Identification for HVAC Piping and Equipment."

E. Disassemble and reassemble units, as required for moving to the final location, according to manufacturer's written instructions.

F. Lift and support units with manufacturer's designated lifting or supporting points.

G. Curb Support: Install roof curb on roof structure, level and secure, according to "The NRCA Roofing and Waterproofing Manual," Low-Slope Membrane Roofing Construction Details Section, Illustration "Raised Curb Detail for Rooftop Air Handling Units and Ducts." Install and secure centrifugal fans on curbs, and coordinate roof penetrations and flashing with roof construction. Secure units to curb support with anchor bolts.

H. Install units with clearances for service and maintenance.

I. Label fans according to requirements specified in Section 230553 "Identification for HVAC Piping and Equipment."

3.2 CONNECTIONS

A. Drawings indicate general arrangement of ducts and duct accessories.

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
2. Verify that cleaning and adjusting are complete.
3. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. For belt-driven fans, reconnect fan drive system, align and adjust belts, and install belt guards.
4. Adjust damper linkages for proper damper operation.
5. Verify lubrication for bearings and other moving parts.
6. See Section 230593 "Testing, Adjusting, and Balancing For HVAC" for testing, adjusting, and balancing procedures.
7. Notify Owner of any malfunctioning units.

B. Test and adjust controls and safeties. Controls and equipment will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

3.4 ADJUSTING

A. Adjust damper linkages for proper damper operation.

B. Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing procedures.

C. Lubricate bearings.

3.5 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain centrifugal fans.

END OF SECTION 233416

SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Square Ceiling Diffusers.
2. Adjustable Supply Grilles
3. Eggcrates
4. Fixed Face Return Grilles

1.3 SUBMITTALS

A. Product Data: For each type of product indicated, include the following:

1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.

2. Diffuser, Register, and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

B. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:

1. Ceiling suspension assembly members.
2. Method of attaching hangers to building structure.
3. Size and location of initial access modules for acoustical tile.
4. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.

PART 2 - PRODUCTS

2.1 CEILING DIFFUSERS

A. Square Ceiling Supply Air Diffusers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Carnes.
    b. METALAIRE, Inc.
    c. Nailor Industries Inc.
    d. Titus.

2. Devices shall be specifically designed for variable-air-volume flows, louvered face with four cone drop design and round neck.
3. Material: Steel or aluminum as scheduled.
4. Finish: Baked enamel, white, unless otherwise scheduled.
5. Provide diffuser as scheduled on drawings.

2.2 REGISTERS AND GRILLES

A. Adjustable Supply Grille:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Carnes.
    b. Krueger.
    c. Nailor Industries Inc.
    d. Titus.

2. Material: Steel or aluminum as scheduled.
3. Finish: Baked enamel, white, unless otherwise noted.
4. Face Arrangement: Double deflection, horizontal blades in front, individually adjustable with blades; 1/2” or 3/4” spacing, as scheduled.
5. Mounting: Wall mounting with 1-1/4” flange frame.
6. Provide as scheduled on drawings.

B. Eggcrate:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Carnes.
    b. Krueger.
    c. Nailor Industries Inc.
    d. Titus.

2. Material: Extruded Aluminum with aluminum core or steel as scheduled.
3. 1/2 inch x1/2 inch x1/2inch deep squares on 45 deg deflection to prevent line of sight from below and with minimum 90% free area.
4. Flat frame to fit lay-in ceiling grid.

5. White baked enamel finish to match ceiling.
6. Neck size and accessories as noted on drawings.

C. Fixed Face Return Grille:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   a. Carnes.
   b. Krueger.
   c. Nailor Industries Inc.
   d. Titus.

2. Material: Steel or aluminum as scheduled.
3. Finish: Baked enamel, white, unless otherwise noted.
4. Face Arrangement: Single deflection, horizontal Blades; 1/2” spacing or, as scheduled, at 35 degree blade setting.
5. Mounting: Wall mounting with steel frame for steel bodied registers or aluminum for aluminum bodied registers.
6. Provide as scheduled on drawings.

2.3 SOURCE QUALITY CONTROL

A. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install diffusers, registers, and grilles level and plumb.

B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in

lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.

C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.3 ADJUSTING

A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 233713

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SECTION 233723 – AIR LOUVERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Air Louvers

1.3 PERFORMANCE REQUIREMENTS

A. Water Entrainment: Limit water penetration through unit to comply with ASHRAE 62.1.

B. Provide AMCA-rated louvers for all fresh air intake and exhaust openings, except as otherwise shown or specified in Contract Documents. Cross- reference dimensions of each louver shown on heating drawings with those on the architectural drawings. Notify architect in writing of any discrepancies prior to submitting on louvers.

1.4 SUBMITTALS

A. Product Data: For each louver Submit manufacturer's product literature, technical specifications, performance data, installation instructions, and similar information required to demonstrate compliance with specified requirements.

B. Shop Drawings: For louvers, in addition to shop drawings specified above, submit complete schedule of locations for each type and size of air louver including wall opening sizes and installation details.

PART 2 - PRODUCTS

2.1 FIXED TYPE RELIEF AIR LOUVERS

A. Factory constructed high performance drainable aluminum louvers with drainable, driven rain resistant blades of AMCA 550 rated performance for high velocity rain resistance and 540 enhanced protection, equal to or better than the design make.

B. Frame and blades constructed of extruded aluminum, alloy 6063-T5. Nominal wall thickness of 0.081 inches, depth 6" deep.

C. Blade angle of 37-degrees.

D. Minimum free area percentage shall be 57%.

E. Aluminum 1/2 inch mesh x 0.063 inch bird screen secured in a removable frame, on inside face of louver.

F. All factory assembled louver components shall be all welded construction.

G. Size, type and location as shown on drawings.

H. Provide scheduled factory finish as detailed below:

1. Kynar: Provide factory applied and baked resin based paint coating, minimum 50% fluoropolymer (PVDF) similar to Kynar 500 or Hylar 5000 as manufactured by the Valspar Corporation. Coating shall meet all performance requirements of AAMA 2605 and ASCA 96. Color as selected by Architect from manufacturer's standard colors.

I. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ruskin.
2. Greenheck.
3. Reliable.
4. Nailor Industries Inc.
5. Titus.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions by Installer: Examine conditions under which all louvers are to be installed and notify affected Contractors and Architects in writing of any conditions detrimental to proper and timely installation. Do not proceed with installation until unsatisfactory conditions have been corrected in an acceptable manner.

1. Coordinate unit selection to meet other equipment and installation. Verify all opening sizes, locations and mounting arrangements prior to installation.

3.2 INSTALLATION

A. Install air louvers in strict accordance with manufacturer's recommended installation instructions for applications shown on Drawings.

B. Comply with manufacturer's specifications and recommendations for assembly and installation of air louver units, hardware, operators, and other components.

1. Set units plumb, level, and true to line, without warp or rack of frames. Anchor securely in place. Separate aluminum and other corrodible metal surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

2. Set head, jamb, and sill members in bed of compound as shown, or with joint fillers or gaskets as shown to provide weather tight construction.

3. Provide suitable gaskets or coating where dissimilar metals are in contact.

C. Clean aluminum surfaces promptly after installation of units. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and other moving parts.

END OF SECTION 233723

SECTION 236200 - PACKAGED COMPRESSOR AND CONDENSER UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes packaged, refrigerant compressor and condenser units.

1.3 ACTION SUBMITTALS

A. Product Data: For each compressor and condenser unit. Include rated capacities, operating characteristics, and furnished specialties and accessories. Include equipment dimensions, weights and structural loads, required clearances, method of field assembly, components, and location and size of each field connection.

B. Shop Drawings: For compressor and condenser units. Include plans, elevations, sections, details, and attachments to other work.

1. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Structural members to which compressor and condenser units will be attached.
2. Liquid and vapor pipe sizes.
3. Refrigerant specialties.
4. Piping including connections, oil traps, and double risers.
5. Compressors.
6. Evaporators.

B. Field quality-control reports.

C. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For compressor and condenser units to include in emergency, operation, and maintenance manuals.

1.6 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Fabricate and label refrigeration system according to ASHRAE 15, "Safety Standard for Refrigeration Systems."

C. ASHRAE/IESNA 90.1 Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6, "Heating, Ventilating, and Air-Conditioning."

D. ASME Compliance: Fabricate and label water-cooled compressor and condenser units to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

1.7 COORDINATION

A. Coordinate sizes and locations of concrete bases. Cast anchor-bolt inserts into bases. Coordinate location of piping and electrical rough-ins.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of compressor and condenser units that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

   a. Compressor failure.
   b. Condenser coil leak.

2. Warranty Period: Five years from date of Substantial Completion.
3. Warranty Period (Compressor Only): Five years from date of Substantial Completion.
4. Warranty Period (Components Other Than Compressor): Five years from date of Substantial Completion.
5. Warranty Period (Condenser Coil Only): Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 COMPRESSOR AND CONDENSER UNITS, AIR COOLED, 1 TO 5 TONS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Mitsubishi
2. Trane
3. Carrier Corporation; a unit of United Technologies Corp.

B. Description: Factory assembled and tested; consisting of compressor, condenser coil, fan, motors, refrigerant reservoir, and operating controls.

C. Compressor-Condenser Components:

1. Casing: Steel, finished with baked enamel in color selected by Architect, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage ports on exterior of casing.
2. Compressor: Hermetically sealed with crankcase heater and mounted on vibration isolation device. Compressor motor shall have thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.

a. Compressor Type: Scroll.
b. Inverter driven compressor with manual-reset high-pressure switch and automatic-reset low-pressure switch.
c. Electronic linear expansion valves for refrigerant metering.
d. Refrigerant Charge: R-410A.
e. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and liquid subcooler. Comply with ARI 206/110.

3. Fan: Aluminum-propeller type, directly connected to motor.
4. Motor: Permanently lubricated, with integral thermal-overload protection.
5. Mounting Base: Polyethylene.

D. Refrigerant: R-410A.

E. Condenser Coil: Seamless copper-tube, aluminum-fin coil; circuited for integral liquid subcooler, with removable drain pan and brass service valves with service ports.

F. Condenser Fan: Direct-drive, aluminum propeller fan; with permanently lubricated, totally enclosed fan motor with thermal-overload protection.

G. Accessories:

1. Cycle Protector: Automatic-reset timer to prevent rapid compressor cycling.

2. Evaporator Freeze Thermostat: Temperature-actuated switch that stops unit when evaporator reaches freezing temperature.
3. Filter-dryer.
4. High-Pressure Switch: Automatic-reset switch cycles compressor off on high refrigerant pressure.
5. Low-Pressure Switch: Automatic-reset switch cycles compressor off on low refrigerant pressure.
6. PE mounting base.
7. Precharged and insulated suction and liquid tubing.

H. Unit Casing: Galvanized steel, finished with baked enamel; with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Mount service valves, fittings, and gage ports on exterior of casing.

I. Capacities and Characteristics: See Drawings

2.2 MOTORS

A. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Section 230513 "Common Motor Requirements for HVAC Equipment."

1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

2.3 SOURCE QUALITY CONTROL

A. Verification of Performance: Rate compressor and condenser units according to ARI 206/110.

B. Energy Efficiency: Equal to or greater than prescribed by ASHRAE/IESNA 90.1, "Energy Efficient Design of New Buildings except Low-Rise Residential Buildings," Section 6, "Heating, Ventilating, and Air-Conditioning."

C. Test and inspect shell and tube condensers according to ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

D. Testing Requirements: Factory test sound-power-level ratings according to ARI 270.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of compressor and condenser units.

B. Examine roughing-in for refrigerant piping systems to verify actual locations of piping connections before equipment installation.

C. Examine walls, floors, and roofs for suitable conditions where compressor and condenser units will be installed.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install units level and plumb, firmly anchored in locations indicated.

B. Maintain manufacturer's recommended clearances for service and maintenance.

C. Loose Components: Install electrical components, devices, and accessories that are not factory mounted.

3.3 CONNECTIONS

A. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.

B. Connect precharged refrigerant tubing to unit's quick-connect fittings. Install tubing so it does not interfere with access to unit. Install furnished accessories.

C. Connect refrigerant piping to air-cooled compressor and condenser units; maintain required access to unit. Install furnished field-mounted accessories. Refrigerant piping and specialties are specified in Section 232300 "Refrigerant Piping."

D. Connect refrigerant and condenser-water piping to water-cooled compressor and condenser units. Maintain clear tube removal space. Refrigerant piping and specialties are specified in Section 232300 "Refrigerant Piping".

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test. Certify compliance with test parameters.
2. Leak Test: After installation, charge system with refrigerant and oil and test for leaks. Repair leaks, replace lost refrigerant and oil, and retest until no leaks exist.

3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor operation and unit operation, product capability, and compliance with requirements.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
5. Verify proper airflow over coils.

C. Verify that vibration isolation and flexible connections properly dampen vibration transmission to structure.

D. Compressor and condenser units will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

3.5 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions and perform the following:

a. Inspect for physical damage to unit casing.
b. Verify that access doors move freely and are weathertight.
c. Clean units and inspect for construction debris.
d. Verify that all bolts and screws are tight.
e. Adjust vibration isolation and flexible connections.
f. Verify that controls are connected and operational.

B. Lubricate bearings on fan motors.

C. Verify that fan wheel is rotating in the correct direction and is not vibrating or binding.

D. Adjust fan belts to proper alignment and tension.

E. Start unit according to manufacturer's written instructions and complete manufacturer's startup checklist.

F. Measure and record airflow and air temperature rise over coils.

G. Verify proper operation of condenser capacity control device.

H. Verify that vibration isolation and flexible connections properly dampen vibration transmission to structure.

I. After startup and performance test, lubricate bearings.

3.6 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain compressor and condenser units.

END OF SECTION 236200

SECTION 238126 - SPLIT-SYSTEM AIR-CONDITIONERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes split-system air-conditioning units consisting of separate evaporator-fan and compressor-condenser components.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. Include performance data in terms of capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For split-system air-conditioning units to include in emergency, operation, and maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Filters: One set(s) for each air-handling unit.

1.7 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. ASHRAE Compliance:

1. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."
2. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 4 - "Outdoor Air Quality," Section 5 - "Systems and Equipment," Section 6 - " Procedures," and Section 7 - "Construction and System Start-up."

C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.

1.8 COORDINATION

A. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork are specified in Section 033000 "Cast-in-Place Concrete."

B. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.

1. Warranty Period:

a. For Compressor: One year(s) from date of Substantial Completion.
b. For Parts: One year(s) from date of Substantial Completion.
c. For Labor: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Carrier Corporation; a unit of United Technologies Corp.
2. Mitsubishi Electric & Electronics USA, Inc.
3. LG Electronics.

2.2 INDOOR UNITS (5 TONS OR LESS)

A. Concealed Evaporator-Fan Components:

1. Chassis: Galvanized steel with flanged edges, removable panels for servicing, and insulation on back of panel.
2. Insulation: Faced, glass-fiber duct liner.
3. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 206/110.
4. Water Coil: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch; leak tested to 300 psig underwater; with a two-position control valve.
5. Electric Coil: Helical, nickel-chrome, resistance-wire heating elements; with refractory ceramic support bushings, automatic-reset thermal cutout, built-in magnetic contactors, manual-reset thermal cutout, airflow proving device, and one-time fuses in terminal box for overcurrent protection.
6. Fan: Forward-curved, double-width wheel of galvanized steel; directly connected to motor.
7. Fan Motors:

    a. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
    b. Multitapped, multispeed with internal thermal protection and permanent lubrication.
    c. Wiring Terminations: Connect motor to chassis wiring with plug connection.

8. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
9. Filters: Permanent, cleanable.
10. Condensate Drain Pans:

    a. Fabricated with one percent slope in at least two planes to collect condensate from cooling coils (including coil piping connections, coil headers, and return bends) and humidifiers, and to direct water toward drain connection.

b. Double-wall, stainless-steel sheet with space between walls filled with foam insulation and moisture-tight seal.
c. Drain Connection: Located at lowest point of pan and sized to prevent overflow.

2.3 OUTDOOR UNITS (5 TONS OR LESS)

A. Air-Cooled, Compressor-Condenser Components:

1. Casing: Steel, finished with baked enamel in color selected by Architect, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage ports on exterior of casing.
2. Compressor: Hermetically sealed with crankcase heater and mounted on vibration isolation device. Compressor motor shall have thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.

    a. Compressor Type: Scroll.
    b. Two-speed compressor motor with manual-reset high-pressure switch and automatic-reset low-pressure switch.
    c. Refrigerant Charge: R-410A.
    d. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and liquid subcooler. Comply with ARI 206/110.
3. Fan: Aluminum-propeller type, directly connected to motor.
4. Motor: Permanently lubricated, with integral thermal-overload protection.
5. Mounting Base: Polyethylene.

2.4 ACCESSORIES

A. Control equipment and sequence of operation are specified in Section 230923 "Direct Digital Control (DDC) System for HVAC" and Section 230993.11 "Sequence of Operations for HVAC DDC."

B. Thermostat: Wireless infrared functioning to remotely control compressor and evaporator fan, with the following features:

1. Compressor time delay.
2. 24-hour time control of system stop and start.
3. Liquid-crystal display indicating temperature, set-point temperature, time setting, operating mode, and fan speed.
4. Fan-speed selection including auto setting.

C. Automatic-reset timer to prevent rapid cycling of compressor.

D. Refrigerant Line Kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install units level and plumb.

B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.

C. Install roof-mounted, compressor-condenser components on equipment supports specified in Section 077200 "Roof Accessories." Anchor units to supports with removable, cadmium-plated fasteners.

D. Install and connect precharged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Where piping is installed adjacent to unit, allow space for service and maintenance of unit.

C. Duct Connections: Duct installation requirements are specified in Section 233113 "Metal Ducts." Drawings indicate the general arrangement of ducts. Connect supply ducts to split-system air-conditioning units with flexible duct connectors. Flexible duct connectors are specified in Section 233300 "Air Duct Accessories."

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Remove and replace malfunctioning units and retest as specified above.

E. Prepare test and inspection reports.

3.4 STARTUP SERVICE

A. Perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.

3.5 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION 238126

SECTION 238129 - VARIABLE-REFRIGERANT-FLOW HVAC SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes complete VRF HVAC system(s) including, but not limited to the following components to make a complete operating system(s) according to requirements indicated:

1. Indoor Units
   a. Recessed, ceiling-mounted units (ceiling cassette units).
   b. Unit Ventilators: See Section 238223 – Unit Ventilators.
2. Outdoor Units.
3. System controls.
4. System refrigerant.
5. System refrigerant piping.
6. Piping and tubing insulation.
7. System control cable and raceways.

B. For Unit Ventilator VRF units, see Specification Section 238223 – Unit Ventilators

1.3 DEFINITIONS

A. Air-Conditioning System Operation: System capable of operation with all zones in cooling only.

B. Heat-Pump System Operation: System capable of operation with all zones in either heating or cooling, but not with simultaneous heating and cooling zones that transfer heat between zones.

C. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

D. Two-Pipe System Design: One refrigerant vapor line and one refrigerant liquid line connect a single outdoor unit or multiple manifold outdoor units in a single system to associated system HRCUs. One refrigerant liquid line and refrigerant vapor line connect HRCUs to associated indoor units. HRCUs used in two pipe systems act as an intermediate heat exchanger and include diverting valves and gas/liquid separators to move high and low pressure refrigerant between indoor units.

E. VRF: Variable refrigerant flow.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for indoor and outdoor units.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
3. Include operating performance at design conditions and at extreme maximum and minimum outdoor ambient conditions.
4. Include description of system controllers, dimensions, features, control interfaces and connections, power requirements, and connections.
5. Include system operating sequence of operation in narrative form for each unique indoor- and outdoor-unit control.
6. Include description of control software features.
7. Include total refrigerant required and a comprehensive breakdown of refrigerant required by each system installed.
8. Include refrigerant type and data sheets showing compliance with requirements indicated.

B. Shop Drawings: For VRF HVAC systems.

1. Include plans, elevations, sections, and mounting details.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.
4. Include diagrams and details of refrigerant piping and tubing showing installation requirements for manufacturer-furnished divided flow fittings.
5. Include diagrams for power, signal, and control wiring.

C. Delegated-Design Submittals:

1. Include design calculations with corresponding diagram of refrigerant piping and tubing sizing for each system installed.
2. Include design calculations with corresponding floor plans indicating that refrigerant concentration limits are within allowable limits of ASHRAE 15 and governing codes.
3. Include calculations showing that system travel distance for refrigerant piping and controls cabling are within horizontal and vertical travel distances set by manufacturer..

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans, elevations, sections, and details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Suspended ceiling components.
2. Structural floors, roofs and associated members to which equipment, piping, cables, and conduit will be attached.
3. Size and location of initial access modules for acoustical tile.
4. Wall-mounted controllers located in finished space showing relationship to light switches, fire-alarm devices, and other installed devices.
5. Size and location of access doors and panels installed behind walls and inaccessible ceilings for products installed behind walls and requiring access.

B. Qualification Data:

1. For Installer: Certificate from VRF HVAC system manufacturer certifying that Installer has successfully completed prerequisite training administered by manufacturer for proper installation of systems, including but not limited to, equipment, piping, controls, and accessories indicated and furnished for installation.

    a. Retain copies of Installer certificates on-site and make available on request.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For VRF HVAC systems to include in emergency, operation, and maintenance manuals.

B. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On CD or DVD, USB media, or approved cloud storage platform, complete with data files.
3. Device address list.
4. Printout of software application and graphic screens.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Filters:
    a. One set(s) for each unit with replaceable filters.
    b. One set(s) for each unit type and unique size of washable filters.
2. Indoor Units: One for each unique size and type installed.

3. Controllers for Indoor Units: One for each unique controller type installed.

1.8 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Nationally recognized manufacturer of VRF HVAC systems and products.
2. Shipped VRF HVAC systems with similar requirements to those indicated for a continuous period of five years within time of bid.
3. VRF HVAC systems and products that have been successfully tested and in use on at least three completed projects.
4. Having complete published catalog literature, installation, and operation and maintenance manuals for all products intended for use.

B. Factory-Authorized Service Representative Qualifications:

1. Authorized representative of, and trained by, VRF HVAC system manufacturer.
2. Demonstrated past experience with products being installed for period within three consecutive years before time of bid.
3. Staffing resources of competent and experienced full-time employees that are assigned to execute work according to schedule.
4. Service and maintenance staff assigned to support Project during warranty period.
5. Product parts inventory to support ongoing system operation for a period of not less than five years after Substantial Completion.
6. VRF HVAC system manufacturer's backing to take over execution of Work if necessary to comply with requirements indicated. Include Project-specific written letter, signed by manufacturer's corporate officer, if requested.

C. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by VRF HVAC system manufacturer.

1. Each employee shall be certified by manufacturer for proper installation of systems, including, but not limited to, equipment, piping, controls, and accessories indicated and furnished for installation.
2. Installer certification shall be valid and current for duration of Project.
3. Retain copies of Installer certificates on-site and make available on request.
4. Each person assigned to Project shall have demonstrated past experience.

D. ISO Compliance: System equipment and components furnished by VRF HVAC system manufacturer shall be manufactured in an ISO 9001 and ISO 14001 facility.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in a clean and dry place.

B. Comply with manufacturer's written rigging and installation instructions for unloading and moving to final installed location.

C. Handle products carefully to prevent damage, breaking, denting, and scoring. Do not install damaged products.

D. Protect products from weather, dirt, dust, water, construction debris, and physical damage.

1. Retain factory-applied coverings on equipment to protect finishes during construction and remove just prior to operating unit.
2. Cover unit openings before installation to prevent dirt and dust from entering inside of units. If required to remover coverings during unit installation, reapply coverings over openings after unit installation and remove just prior to operating unit.

E. Replace installed products damaged during construction.

1.10 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace equipment and components that fail(s) in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures.
b. Faulty operation.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period:

a. For Compressor: Five year(s) from date of Substantial Completion.
b. For Parts, Including Controls: Five year(s) from date of Substantial Completion.
c. For Labor: Five year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Carrier Corporation; a unit of United Technologies Corp.
2. LG Electronics.
3. Mitsubishi Electric & Electronics USA, Inc.
4. Trane Company (The).

B. Source Limitations: Obtain products from single source from single manufacturer including, but not limited to, the following:

1. Indoor and outdoor units, including accessories.
2. Controls and software.
3. Refrigerant isolation valves.

2.2 SYSTEM DESCRIPTION

A. Direct-expansion (DX) VRF HVAC system(s) with variable capacity in response to varying cooling and heating loads. System shall consist of multiple indoor units, outdoor unit(s), piping, controls, and electrical power to make complete operating system(s) complying with requirements indicated.

1. Two-pipe system design.
2. System(s) operation, air-conditioning or heat pump as indicated on Drawings.
3. Each system with one refrigerant circuit shared by all indoor units connected to system.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. AHRI Compliance: System and equipment performance certified according to AHRI 1230 and products listed in AHRI directory.

D. ASHRAE Compliance:

1. ASHRAE 15: For safety code for mechanical refrigeration.
2. ASHRAE 62.1: For indoor air quality.
3. ASHRAE 135: For control network protocol with remote communication.
4. ASHRAE/IES 90.1 Compliance: For system and component energy efficiency.

E. UL Compliance: Comply with UL 1995.

2.3 PERFORMANCE REQUIREMENTS

A. System Auto Refrigerant Charge: Each system shall have an automatic refrigerant charge function to ensure the proper amount of refrigerant is installed in system.

B. Outdoor Conditions:

1. Suitable for outdoor ambient conditions encountered.
    a. Design equipment and supports to withstand wind loads of governing code and ASCE/SEI 7.
    b. Design equipment and supports to withstand snow and ice loads of governing code and ASCE/SEI 7.

C. Seismic Performance: VRF HVAC system(s) shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the system will remain in place without separation of any parts when subjected to the seismic forces specified."
2. Component Importance Factor: 1.5.
   a. SDS: 0.145g as per ASCE 7-10 Section 11.4.4
   b. SD1: 0.087g as per ASCE 7-10 Section 11.4.4

2.4 INDOOR UNITS

A. Description: Factory-assembled and -tested complete unit with components, piping, wiring, and controls required for mating to ductwork, piping, power, and controls field connections.

B. Cabinet:

1. Material: Painted steel, or coated steel frame covered by a plastic cabinet, with an architectural acceptable finish suitable for tenant occupancy on exposed surfaces.
2. Insulation: Manufacturer's standard internal insulation to provide thermal resistance and prevent condensation.
3. Mounting: Manufacturer-designed provisions for field installation.

C. DX Coil Assembly:

1. Coil Casing: Aluminum, galvanized, or stainless steel.
2. Coil Fins: Aluminum, mechanically bonded to tubes, with arrangement required by performance.
3. Coil Tubes: Copper, of diameter and thickness required by performance.
4. Expansion Valve: Electronic modulating type with linear or proportional characteristics.
5. Internal Tubing: Copper tubing with brazed joints.
6. Internal Tubing Insulation: Manufacturer's standard insulation, of thickness to prevent condensation.
7. Field Piping Connections: Manufacturer's standard.
8. Factory Charge: Dehydrated air or nitrogen.
9. Testing: Factory pressure tested and verified to be without leaks.

D. Drain Assembly:

1. Pan: Non-ferrous material, with bottom sloped to low point drain connection.

2. Condensate Removal: Unit-mounted pump or other integral lifting mechanism, capable of lifting drain water to an elevation above top of cabinet.

   a. Integral reservoir and control with electrical power connection through unit power.

3. Field Piping Connection: Non-ferrous material with threaded NPT.

E. Fan and Motor Assembly:

1. Fan(s):

a. Direct-drive arrangement.
b. Single or multiple fans connected to a common motor shaft and driven by a single motor.
c. Fabricated from non-ferrous components or ferrous components with corrosion protection finish.
d. Wheels statically and dynamically balanced.

2. Motor: Brushless dc or electronically commutated with permanently lubricated bearings.
3. Motor Protection: Integral protection against thermal, overload, and voltage fluctuations.
4. Speed Settings and Control: Two (low, high), three (low, medium, high), or more than three speed settings or variable speed with a speed range of least 50 percent.
5. Vibration Control: Integral isolation to dampen vibration transmission.

F. Filter Assembly:

1. Access: Replacement without the need for tools.
2. Media:

a. Replaceable: Extended surface, panel, or cartridge with antimicrobial treatment fiber media.
b. Washable: Manufacturer's standard filter with antimicrobial treatment.

G. Discharge-Air Grille and Return Assembly

1. Ceiling Cassette Unit:

a. Discharge mounted in bottom of unit cabinet.

1) Discharge Pattern: four-way throw unless indicated on Drawings.
2) Discharge Pattern Adjustment: Field-adjustable limits for up and down range of motion.
3) Discharge Pattern Closure: Ability to close individual discharges of units with multiple patterns.
4) Motorized Vanes: Modulating up and down flow pattern for uniform room air distribution.

b. Return-Air Grille Assembly: Manufacturer's standard grille mounted in bottom of unit cabinet.

H. Unit Controls:

1. Enclosure: Manufacturer's standard, and suitable for indoor locations.
2. Factory-Installed Controller: Configurable digital control.
3. Field-Customizable I/O Capability:
4. Communication: Network communication with other indoor units and outdoor unit(s).
5. Cable and Wiring: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.
6. Field Connection: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.

I. Unit Electrical:

1. Enclosure: Manufacturer's standard, and suitable for indoor locations.
2. Field Connection: Single point connection to power entire unit and integral controls.
3. Disconnecting Means: Factory-mounted circuit breaker or switch, complying with NFPA 70.
4. Control Transformer: Manufacturer's standard. Coordinate requirements with field power supply.
5. Wiring: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.

2.5 OUTDOOR, AIR-SOURCE HEAT-PUMP UNITS

A. Description: Factory-assembled and -tested complete unit with components, piping, wiring, and controls required for mating to piping, power, and controls field connections.

1. Specially designed for use in systems with either all heating or all cooling demands, but not for use in systems with simultaneous heating and cooling.
2. Systems shall consist of one unit, or multiple unit modules that are designed by variable refrigerant system manufacturer for field interconnection to make a single refrigeration circuit that connects multiple indoor units.

B. Cabinet:

1. Galvanized steel and coated with a corrosion-resistant finish.

    a. Coating with documented salt spray test performance of 1000 hours according ASTM B117 surface scratch test (SST) procedure.

2. Mounting: Manufacturer-designed provisions for field installation.
3. Internal Access: Removable panels or hinged doors of adequate size for field access to internal components for inspection, cleaning, service, and replacement.

C. Compressor and Motor Assembly:

1. One or more positive-displacement, direct-drive and hermetically sealed scroll compressor(s) with inverter drive and turndown to 15 percent of rated capacity.
2. Protection: Integral protection against the following:

    a. High refrigerant pressure.
    b. Low oil level.
    c. High oil temperature.
    d. Thermal and overload.
    e. Voltage fluctuations.
    f. Phase failure and phase reversal.
    g. Short cycling.

3. Speed Control: Variable to automatically maintain refrigerant suction and condensing pressures while varying refrigerant flow to satisfy system cooling and heating loads.
4. Vibration Control: Integral isolation to dampen vibration transmission.
5. Oil management system to ensure safe and proper lubrication over entire operating range.
6. Crankcase heaters with integral control to maintain safe operating temperature.
7. Fusible plug.

D. Condenser Coil Assembly:

1. Plate Fin Coils:

    a. Casing: Aluminum, galvanized, or stainless steel.
    b. Fins: Aluminum or copper, mechanically bonded to tubes, with arrangement required by performance.
    c. Tubes: Copper, of diameter and thickness required by performance.

2. Aluminum Microchannel Coils:

    a. Series of flat tubes containing a series of multiple, parallel-flow microchannels layered between refrigerant header manifolds.
    b. Single- or multiple-pass arrangement.
    c. Construct fins, tubes, and header manifolds of aluminum alloy.

3. Hail Protection: Provide condenser coils with louvers, baffles, or hoods to protect against hail damage.

E. Condenser Fan and Motor Assembly:

1. Fan(s): Propeller type.

    a. Direct-drive arrangement.
    b. Fabricated from non-ferrous components or ferrous components with corrosion protection finish to match performance indicated for condenser coil.
    c. Statically and dynamically balanced.

2. Fan Guards: Removable safety guards complying with OSHA regulations. If using metal materials, coat with corrosion-resistant coating to match performance indicated for condenser coil.
3. Motor(s): Brushless dc or electronically commutated with permanently lubricated bearings and rated for outdoor duty.
4. Motor Protection: Integral protection against thermal, overload, and voltage fluctuations.
5. Speed Settings and Control: Variable speed with a speed range of least 75 percent.
6. Vibration Control: Integral isolation to dampen vibration transmission.

F. Drain Pan: If required by manufacturer's design, provide unit with non-ferrous drain pan with bottom sloped to a low point drain connection.

G. Unit Controls:

1. Enclosure: Manufacturer's standard, and suitable for unprotected outdoor locations.
2. Factory-Installed Controller: Configurable digital control.
3. Factory-Installed Sensors:

    a. Refrigerant suction temperature.
    b. Refrigerant discharge temperature.
    c. Outdoor air temperature.
    d. Refrigerant high pressure.
    e. Refrigerant low pressure.
    f. Oil level.
4. Communication: Network communication with indoor units and other outdoor unit(s).
5. Cable and Wiring: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.
6. Field Connection: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.

H. Unit Electrical:

1. Enclosure: Metal, similar to enclosure, and suitable for unprotected outdoor locations.
2. Field Connection: Single point connection to power entire unit and integral controls.
3. Disconnecting Means: Factory-mounted circuit breaker or switch, complying with NFPA 70.
4. Control Transformer: Manufacturer's standard. Coordinate requirements with field power supply.
5. Wiring: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.

I. Unit Hardware: Zinc-plated steel, or stainless steel. Coat exposed surfaces with additional corrosion-resistant coating if required to prevention corrosion when exposed to salt spray test for 1000 hours according ASTM B117.

J. Unit Piping:

1. Unit Tubing: Copper tubing with brazed joints.
2. Unit Tubing Insulation: Manufacturer's standard insulation, of thickness to prevent condensation.
3. Field Piping Connections: Manufacturer's standard.
4. Factory Charge: Dehydrated air or nitrogen.
5. Testing: Factory pressure tested and verified to be without leaks.

2.6 SYSTEM CONTROLS

A. General Requirements:

1. Network: Indoor units and outdoor units shall include integral controls.
2. Network Communication Protocol: open control communication between interconnected units.
3. Integration with Building Automation System: ASHRAE 135, BACnet IP and certified by BACnet Testing Lab (BTL), including the following:

    a. Ethernet connection via RJ-45 connectors and port with transmission at 100 Mbps or higher.
    b. Integration devices shall be connected to local uninterruptible power supply unit(s) to provide at least 5 minutes of battery backup operation after a power loss.
    c. Integration shall include control, monitoring, and scheduling change of value notifications.

4. Operator Interface:

    a. Operators shall interface with system and unit controls through the following:

        1) Integration with Building Automation System.

B. VRF HVAC System Operator Software for PC:

1. Software offered by VRF HVAC system manufacturer shall provide system operators with ability to monitor and control VRF HVAC system(s) from a single dedicated Owner-furnished PC.
2. Software shall provide operator with a graphic user interface to allow monitoring and control of multiple central controllers from a single device location through point-and-click mouse exchange.
3. Plan views shall show building plans with location of indoor units and identification superimposed on plans.
4. Controls operation mode of indoor units as individual units, by selected groups of indoor units, or as collection of all indoor units. Operation modes available through central controller shall match those operation modes of controllers for indoor units.

5. Schedules operation of indoor units as individual units, by selected groups of indoor units, or as collection of all indoor units. Schedules daily, weekly, and annual events.
6. Changes operating set points of indoor units as individual units, by selected groups of indoor units, or as collection of all indoor units.
7. Optimized start feature to start indoor units before scheduled time to reach temperature set-point at scheduled time based on operating history.
8. Night setback feature to operate indoor units at energy-conserving heating and cooling temperature set-points during unoccupied periods.
9. Displays service notifications and error codes.
10. Monitors and displays cumulative operating time of indoor units.
11. Able to disable and enable operation of individual controllers for indoor units.
12. Information displayed on individual controllers shall also be available for display.
13. Information displayed for outdoor units, including refrigerant high and low pressures.

C. Central Controllers:

1. Centralized control for all indoor and outdoor units from a single central controller location.

    a. Include multiple interconnected controllers as required.

2. Controls operation mode of indoor units as individual units, by selected groups of indoor units, or as collection of all indoor units. Operation modes available through central controller shall match those operation modes of controllers for indoor units.
3. Schedule operation of indoor units as individual units, by selected groups of indoor units, or as collection of all indoor units.

    a. Sets schedule for daily, weekly, and annual events.
    b. Schedule options available through central controller shall at least include the schedule options of controllers for indoor units.

4. Changes operating set points of indoor units as individual units, by selected groups of indoor units, or as collection of all indoor units.
5. Optimized start feature to start indoor units before scheduled time to reach temperature set-point at scheduled time based on operating history.
6. Night setback feature to operate indoor units at energy-conserving heating and cooling temperature set-points during unoccupied periods.
7. Service diagnostics tool.
8. Able to disable and enable operation of individual controllers for indoor units.
9. Information displayed on individual controllers shall also be available for display through central controller.
10. Multiple RJ-45 ports for direct connection to a local PC and an Ethernet network switch.
11. Operator interface through a backlit, high-resolution color display touch panel and web accessible through standard web browser software.

D. Wired Controllers for Indoor Units:

1. Single controller capable of controlling multiple indoor units as group.
2. Auto Timeout Touch Screen LCD: Timeout duration shall be adjustable.
3. On/Off: Turns indoor unit on or off.
4. Hold: Hold operation settings until hold is released.
5. Operation Mode: Cool, Heat, Auto, Dehumidification, Fan Only, and Setback.
6. Temperature Display: 1-degree increments.
7. Temperature Set-Point: Separate set points for Cooling, Heating, and Setback. Adjustable in 1-degree increments.
8. Fan Speed Setting: Select between available options furnished with the unit.
9. Airflow Direction Setting: If applicable to unit, select between available options furnished with the unit.
10. Seven-day programmable operating schedule with up to eight events per day. Operations shall include On/Off, Operation Mode, and Temperature Set-Point.
11. Auto Off Timer: Operates unit for an adjustable time duration and then turns unit off.
12. Occupancy detection.
13. Service Notification Display: "Filter".
14. Service Run Tests: Limit use by service personnel to troubleshoot operation.
15. Error Code Notification Display: Used by service personnel to troubleshoot abnormal operation and equipment failure.
16. User and Service Passwords: Capable of preventing adjustments by unauthorized users.
17. Setting stored in nonvolatile memory to ensure that settings are not lost if power is lost. Battery backup for date and time only.
18. Low-voltage power required for controller shall be powered through non-polar connections to indoor unit.

2.7 SYSTEM REFRIGERANT AND OIL

A. Refrigerant:

1. As required by VRF HVAC system manufacturer for system to comply with performance requirements indicated.
2. ASHRAE 34, Class A1 refrigerant classification.
3. R-410a.

2.8 SYSTEM HYDRONIC PIPING

A. Comply with requirements in Section 232113 "Hydronic Piping" for system piping requirements.

2.9 SYSTEM REFRIGERANT PIPING

A. Comply with requirements in Section 232300 "Refrigerant Piping" for system piping requirements.

B. Refrigerant Piping:

1. Copper Tube: ASTM B280, Type ACR.
2. Wrought-Copper Fittings: ASME B16.22.
3. Brazing Filler Metals: AWS A5.8/A5.8M.

C. Refrigerant Tubing Kits:

1. Furnished by VRF HVAC system manufacturer.
2. Factory-rolled and -bundled, soft-copper tubing with tubing termination fittings at each end.
3. Standard one-piece length for connecting to indoor units.
4. Pre-insulated with flexible elastomeric insulation of thickness to comply with governing energy code and sufficient to eliminate condensation.
5. Factory Charge: Dehydrated air or nitrogen.

D. Divided-Flow Specialty Fittings: Where required by VRF HVAC system manufacturer for proper system operation, VRF HVAC system manufacturer shall furnish specialty fittings with identification and instructions for proper installation by Installer.

E. Refrigerant Isolation Ball Valves:

1. Description: Uni-body full port design, rated for maximum system temperature and pressure, and factory tested under pressure to ensure tight shutoff. Designed for valve operation without removing seal cap.
2. Seals: Compatible with system refrigerant and oil. Seal service life of at least 20 years.
3. Valve Connections: Flare or sweat depending on size.

2.10 PIPING AND TUBING INSULATION

A. Comply with Section 230700 – “HVAC Insulation:

2.11 SYSTEM CONTROL CABLE

A. Cable Rating: Listed and labeled for application according to NFPA 70.

1. Flame Travel and Smoke Density in Plenums: As determined by testing identical products according to NFPA 262, by a qualified testing agency. Identify products for installation in plenums with appropriate markings of applicable testing agency.

a. Flame Travel Distance: 60 inches or less.
b. Peak Optical Smoke Density: 0.5 or less.
c. Average Optical Smoke Density: 0.15 or less.

2. Flame Travel and Smoke Density for Riser Cables in Non-Plenum Building Spaces: As determined by testing identical products according to UL 1666.
3. Flame Travel and Smoke Density for Cables in Non-Riser Applications and Non-Plenum Building Spaces: As determined by testing identical products according to UL 1685.

B. Low-Voltage Control Cabling:

1. Paired Cable: NFPA 70, Type CMG.

   a. One pair, twisted, No. 16 AWG, stranded (19x29) or No. 18 AWG, stranded (19x30) tinned-copper conductors as required by VRF HVAC system manufacturer.
   b. PVC insulation.
   c. Braided or foil shielded.
   d. PVC jacket.
   e. Flame Resistance: Comply with UL 1685.

2. Plenum-Rated, Paired Cable: NFPA 70, Type CMP.

   a. One pair, twisted, No. 16 AWG, stranded (19x29) or No. 18 AWG, stranded (19x30) tinned-copper conductors as required by VRF HVAC system manufacturer.
   b. PVC insulation.
   c. Braided or foil shielded.
   d. PVC jacket.
   e. NFPA 262 includes the standard flame-resistance test criteria in common use for cables and conductors.
   f. Flame Resistance: Comply with NFPA 262.

C. TIA-485A Network Cabling:

1. Standard Cable: NFPA 70, Type CMG.

   a. Paired, two pairs, twisted, No. 22 AWG, stranded (7x30) tinned-copper conductors.
   b. PVC insulation.
   c. Unshielded.
   d. PVC jacket.
   e. Flame Resistance: Comply with UL 1685.

2. Plenum-Rated Cable: NFPA 70, Type CMP.

   a. Paired, No. 22 AWG, stranded (7x30) tinned-copper conductors.
   b. Fluorinated ethylene propylene insulation.
   c. Unshielded.
   d. Fluorinated ethylene propylene jacket.
   e. NFPA 262 includes the standard flame-resistance test criteria in common use for cables and conductors.
   f. Flame Resistance: NFPA 262.

D. Ethernet Network Cabling: TIA-568-C.2 Category 6 Insert category cable with RJ-45 connectors.

1. Description: Four-pair, balanced-twisted pair cable, certified to meet transmission characteristics of category cable indicated.

2. Conductors: 100-ohm, 23 AWG solid copper.
3. Shielding: Shielded twisted pairs (FTP).
4. Cable Rating: By application.
5. Jacket: thermoplastic.

E. Comply with requirements in Section 260533 "Raceways and Boxes for Electrical Systems" for control wiring and cable raceways.

2.12 SOURCE QUALITY CONTROL

A. Factory Tests: Test and inspect factory-assembled equipment.
B. Equipment will be considered defective if it does not pass tests and inspections.
C. Prepare test and inspection reports for historical record. Submit reports only if requested.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
B. Examine products before installation. Reject products that are wet, moisture damaged, or mold damaged.
C. Examine roughing-in for piping and tubing to verify actual locations of connections before equipment installation.
D. Examine roughing-in for wiring and conduit to verify actual locations of connections before equipment installation.
E. Examine walls, floors, roofs, and outdoor pads for suitable conditions where equipment will be installed.
F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EQUIPMENT INSTALLATION, GENERAL

A. Clearance:

1. Maintain manufacturer's recommended clearances for service and maintenance.

B. Loose Components: Install components, devices, and accessories furnished by manufacturer, with equipment, that are not factory mounted.

1. Loose components shall be installed by manufacturer's service representative or system Installer under supervision of manufacturer's service representative.

C. Equipment Restraint Installation: Install equipment with seismic-restraint device. Comply with requirements for seismic-restraint devices specified in Section 230548 "Vibration and Seismic Controls for HVAC."

3.3 INSTALLATION OF INDOOR UNITS

A. Install units to be level and plumb while providing a neat and finished appearance.

B. Unless otherwise required by VRF HVAC system manufacturer, support ceiling-mounted units from structure above using threaded rods; minimum rod size of 3/8 inch.

C. Adjust supports of exposed and recessed units to draw units tight to adjoining surfaces.

D. Protect finished surfaces of ceilings, floors, and walls that come in direct contact with units. Refinish or replaced damaged areas after units are installed.

E. In rooms with ceilings, conceal piping and tubing, controls, and electrical power serving units above ceilings.

F. In rooms without ceiling, arrange piping and tubing, controls, and electrical power serving units to provide a neat and finished appearance.

G. Provide lateral bracing if needed to limit movement of suspended units to not more than 0.25 inch.

3.4 INSTALLATION OF OUTDOOR UNITS

A. Install units to be level and plumb while providing a neat and finished appearance.

B. Install outdoor units on support structures indicated on Drawings.

C. Pad-Mounted Installations: Install outdoor units on cast-in-place concrete equipment bases.

1. Attachment: Install anchor bolts to elevations required for proper attachment to supported equipment.

2. Grouting: Place grout under equipment supports and make bearing surface smooth.

D. Roof-Mounted Installations: Install outdoor units on equipment supports specified in Section 077200 "Roof Accessories." Anchor units to supports with removable, stainless-steel fasteners.

3.5 GENERAL REQUIREMENTS FOR PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping and tubing systems. Install piping and tubing as indicated unless deviations to layout are approved on coordination drawings.

B. Install piping and tubing in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

C. Install piping and tubing at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

D. Install piping and tubing above accessible ceilings to allow sufficient space for ceiling panel removal.

E. Install piping and tubing to permit valve servicing.

F. Install piping and tubing at indicated slopes.

G. Install piping and tubing free of sags.

H. Install fittings for changes in direction and branch connections.

I. Install piping and tubing to allow application of insulation.

J. Install groups of pipes and tubing parallel to each other, spaced to permit applying insulation with service access between insulated piping and tubing.

K. Install sleeves for piping and tubing penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."

L. Install escutcheons for piping and tubing penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 230518 "Escutcheons for HVAC Piping."

3.6 INSTALLATION OF SYSTEM CONDENSATE DRAIN PIPING

A. General Requirements for Drain Piping and Tubing:

1. Install a union in piping at each threaded unit connection.
2. Install an adjustable stainless-steel hose clamp with adjustable gear operator on unit hose connections. Tighten clamp to provide a leak-free installation.
3. If required for unit installation, provide a trap assembly in drain piping to prevent air circulated through unit from passing through drain piping. Comply with more stringent of the following:

    a. Details indicated on Drawings.
    b. Manufacturer's requirements.

c. Governing codes.
d. In the absence of requirements, comply with requirements of ASHRAE handbooks.

4. Extend drain piping from units with drain connections to drain receptors as indicated on Drawings. If not indicated on Drawings, terminate drain connection at nearest accessible location that is not exposed to view by occupants.
5. Provide each 90-degree change in direction with a Y- or T-fitting. Install a threaded plug connection in the dormant side of fitting or future use as a service cleanout.

B. Gravity Drains:

1. Slope piping from unit connection toward drain termination at a constant slope of not less than two percent.

C. Pumped Drains:

1. If unit condensate pump or lift mechanism is not included with an integral check valve, install a full-size check valve in each branch pipe near unit connection to prevent backflow into unit.

3.7 INSTALLATION OF REFRIGERANT PIPING

A. Refrigerant Tubing Kits:

1. Unroll and straighten tubing to suit installation. Deviations in straightness of exposed tubing shall be unnoticeable to observer.
2. Support tubing using hangers and supports indicated at intervals not to exceed 5 feet. Minimum rod size, 1/4 inch.
3. Prepare tubing ends and make mating connections to provide a pressure tight and leak-free installation.

B. Install refrigerant piping according to ASHRAE 15 and governing codes.

C. Select system components with pressure rating equal to or greater than system operating pressure.

D. Install piping as short and direct as possible, with a minimum number of joints and fittings.

E. Arrange and install piping, valves and specialties in accessible locations to allow for service and inspection of equipment.

F. Install refrigerant piping and tubing in rigid or flexible conduit in locations where exposed to mechanical damage.

G. Unless otherwise required by VRF HVAC system manufacturer, slope refrigerant piping and tubing as follows:

1. Install horizontal hot-gas discharge piping and tubing with a uniform slope downward away from compressor.
2. Install horizontal suction lines with a uniform slope downward to compressor.
3. Install traps to entrain oil in vertical runs.
4. Liquid lines may be installed level.

H. When brazing, remove or protect components that could be damaged by heat.

I. Before installation, clean piping, tubing, and fittings to cleanliness level required by VRF HVAC system manufacturer.

J. Joint Construction (all refrigerant piping):

1. Ream ends of tubes and remove burrs.
2. Remove scale, slag, dirt, and debris from inside and outside of tube and fittings before assembly.
3. Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter.

    a. Use Type BCuP (copper-phosphorus) alloy for joining copper fittings with copper tubing.
    b. Use Type BAg (cadmium-free silver) alloy for joining copper with bronze.

3.8 INSTALLATION OF PIPING AND TUBING INSULATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated. Installation to maintain a continuous vapor barrier.

B. Insulation Installation on Pipe Fittings and Elbows:

1. Install mitered sections of pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed valve covers manufactured of same material as pipe insulation when available.
2. When preformed valve covers are unavailable, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints; for horizontal applications. Seal with manufacturer's recommended adhesive.

1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

E. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

3.9 INSTALLATION OF SYSTEM CONTROL CABLE

A. Comply with NECA 1.

B. Installation Method:

1. Install cables in raceways except as follows:

a. Within equipment and associated control enclosures.
b. In accessible ceiling spaces where open cable installation method may be used.
c. In gypsum board partitions where cable may be enclosed within wall cavity.

2. Conceal raceway and cables except in unfinished spaces.

C. General Requirements for Cabling:

1. Comply with TIA-568-C Series of standards.
2. Comply with BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems."
3. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, and cross-connect and patch panels.
4. Cables may not be spliced and shall be continuous from terminal to terminal. Do not splice cable.
5. Cables serving a common system may be grouped in a common raceway. Install control cable in separate raceway from power wiring. Do not group conductors from different systems or different voltages.
6. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems." Install lacing bars and distribution spools.
8. Do not install bruised, kinked, scored, deformed, or abraded cable. Remove and discard cable if damaged during installation and replace it with new cable.
9. Cold-Weather Installation: Bring cable to room temperature before dereeling. Do not use heat lamps for heating.

10. Pulling Cable: Comply with BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems." Monitor cable pull tensions.
11. Support: Do not allow cables to lie on removable ceiling tiles or access panels.
12. Secure: Fasten securely in place with hardware specifically designed and installed so as to not damage cables.
13. Provide strain relief.
14. Keep runs short. Allow extra length for connecting to terminals.
15. Do not bend cables in a radius less than 10 times the cable OD.
16. Use sleeves or grommets to protect cables from vibration at points where they pass around sharp corners and through penetrations.
17. Ground wire shall be copper, and grounding methods shall comply with IEEE C2. Demonstrate ground resistance.

D. Balanced Twisted-Pair Cable Installation:

1. Comply with TIA-568-C.2.
2. Do not untwist balanced twisted-pair cables more than 1/2 inch at the point of termination to maintain cable geometry.

E. Open-Cable Installation:

1. Suspend copper cable not in a wireway or pathway a minimum of 8 inches above ceilings by cable supports not more than 30 inches apart.
2. Cable shall not be run through or on structural members or in contact with pipes, ducts, or other potentially damaging items. Do not run cables between structural members and corrugated panels.

F. Separation from EMI Sources: Comply with BICSI TDMM and TIA-569-D recommendations for separating unshielded cable from potential EMI sources including electrical power wiring and equipment.

3.10 GROUNDING INSTALLATION

A. For data communication wiring, comply with TIA-607-B and with BICSI TDMM, "Bonding and Grounding (Earthing)" Chapter.

B. For low-voltage control cabling, comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems."

3.11 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage VRF HVAC system manufacturer's service representative to advise and assist installers; witness testing; and observe and inspect components, assemblies, and equipment installations, including controls and connections.

1. Field service shall be performed by a factory-trained and -authorized service representative of VRF HVAC system manufacturer whose primary job responsibilities are to provide direct technical support of its products.

    a. Additional factory-authorized representatives may assist with completion of certain activities only if supervised by manufacturer's employee. A factory-authorized representative shall not provide assistance without manufacturer's employee supervision.

2. Manufacturer shall provide on-site visits during the course of construction at installation milestones indicated. System Installer shall coordinate each visit in advance to give manufacturer sufficient notice to plan the visit.

    a. First Visit: Kick-off meeting.
    b. Second Visit: At approximately 50 percent completion of system(s).
    c. Third Visit: At approximately 75 percent completion of system(s).
    d. Fourth Visit: Final inspection before system startup.

3. Kick-off Meeting:

    a. Meeting shall include system Installer and other related trades with sole purpose of reviewing VRF HVAC system installation requirements and close coordination required to make a successful installation.
    b. Meeting shall be held at Project site and scheduled at a mutually agreed to time that occurs before the start of any part of system installation.
    c. Meeting shall cover the following as a minimum requirement:

        1) Review of latest issue of Contract Documents, Drawings, and Specifications, relevant to VRF HVAC systems.
        2) Manufacturer's installation requirements specific to systems being installed.
        3) Review of all relevant VRF HVAC system submittals, including delegated-design submittals.
        4) Required field activities related installation of VRF HVAC system.
        5) Project team communication protocol, contact information, and exchange of responsibilities for each party involved, including manufacturer, supplier, system Installer, and other related trades.

4. Site Visits: Activities for each site visit shall include the following:

    a. Meet with VRF HVAC system Installer to discuss field activities, issues, and suggested methods to result in a successful installation.
    b. Offer technical support to Installer and related trades as related to VRF system(s) being installed.
    c. Review progress of VRF HVAC system(s) installation for strict compliance with manufacturer's requirements.
    d. Advise and if necessary assist Installer with updating related refrigerant calculations and system documentation.
    e. Issue a report for each visit, documenting the visit.

1) Report to include name and contact information of individual making the visit.
2) Date(s) and time frames while on-site.
3) Names and contact information of people meeting with while on-site.
4) Clearly identify and list each separate issue that requires resolution. For each issue, provide a unique identification number, relevant importance, specific location or equipment identification, description of issue, recommended corrective action, and follow-up requirements needed. Include a digital photo for clarification if deemed to be beneficial.

5. Final Inspection before Startup:

a. Before inspection, Installer to provide written request to manufacturer stating the system is fully installed according manufacturer's requirements and ready for final inspection.
b. All system equipment and operating components shall be inspected. If components are inaccessible for inspection, they shall be made accessible before the final inspection can be completed.
c. Manufacturer shall provide a comprehensive inspection of all equipment and each operating component that comprise the complete system(s). Inspection shall follow a detailed checklist specific to each equipment and operating component.
d. Inspection reports for indoor units shall include, but not be limited to, the following:

1) Unit designation on Drawings.
2) Manufacturer model number.
3) Serial number.
4) Network address, if applicable.
5) Each equipment setting.
6) Mounting, supports, and restraints properly installed.
7) Proper service clearance provided.
8) Wiring and power connections correct.
9) Line-voltage reading(s) within acceptable range.
10) Wiring and controls connections correct.
11) Low-voltage reading(s) within an acceptable range.
12) Controller type and model controlling unit.
13) Controller location.
14) Temperature settings and readings within an acceptable range.
15) Humidity settings and readings within an acceptable range.
16) Condensate removal acceptable.
17) Fan settings and readings within an acceptable range.
18) Unit airflow direction within an acceptable range.
19) If applicable, fan external static pressure setting.
20) Filter type and condition acceptable.
21) Noise level within an acceptable range.
22) Refrigerant piping properly connected and insulated.
23) Condensate drain piping properly connected and insulated.
24) If applicable, ductwork properly connected.

25) If applicable, external interlocks properly connected.
26) Remarks.

e. Inspection reports for outdoor units shall include, but not be limited to, the following:

1) Unit designation on Drawings.
2) Manufacturer model number.
3) Serial number.
4) Network address, if applicable.
5) Each equipment setting.
6) Mounting, supports, and restraints properly installed.
7) Proper service clearance provided.
8) Wiring and power connections correct.
9) Line-voltage reading(s) within acceptable range.
10) Wiring and controls connections correct.
11) Low-voltage reading(s) within an acceptable range.
12) Condensate removal acceptable.
13) Noise level within an acceptable range.
14) Refrigerant piping properly connected and insulated.
15) Condensate drain piping properly connected and insulated.
16) Remarks.

f. Inspection reports for indoor units shall include, but not be limited to, the following:

1) Unit designation on Drawings.
2) Manufacturer model number.
3) Serial number.
4) Network address, if applicable.
5) Each equipment setting.
6) Mounting, supports, and restraints properly installed.
7) Proper service clearance provided.
8) Wiring and power connections correct.
9) Line-voltage reading(s) within acceptable range.
10) Wiring and controls connections correct.
11) Low-voltage reading(s) within an acceptable range.
12) Controller type and model controlling unit.
13) Controller location.
14) Temperature settings and readings within an acceptable range.
15) Condensate removal acceptable.
16) Fan settings and readings within an acceptable range.
17) Fan external static pressure setting.
18) Filter type and condition acceptable.
19) Noise level within an acceptable range.
20) Refrigerant piping properly connected and insulated.
21) Condensate drain piping properly connected and insulated.
22) Automatic dampers properly installed and operating.
23) If applicable, external interlocks properly connected.
24) Remarks.

g. Installer shall provide manufacturer with the requested documentation and technical support during inspection.
h. Installer shall correct observed deficiencies found by the inspection.
i. Upon completing the on-site inspection, manufacturer shall provide a written report with complete documentation describing each inspection step, the result, and any corrective action required.
j. If corrective action is required by Installer that cannot be completed during the same visit, provide additional visits, as required, until deficiencies are resolved and systems are deemed ready for startup.
k. Final report shall indicate the system(s) inspected are installed according to manufacturer's requirements and are ready for startup.

B. Perform the following tests and inspections with the assistance of manufacturer's service representative:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Refrigerant Tubing Positive Pressure Testing:

1. Comply with more stringent of VRF HVAC system manufacturer's requirements and requirements indicated.
2. After completion of tubing installation, pressurize tubing systems to a test pressure of not less than 1.25 times VRF HVAC system operating pressure, but not less than 600 psig, using dry nitrogen.
3. Successful testing shall maintain a test pressure for a continuous and uninterrupted period of 24 hours. Allowance for pressure changes attributed to changes in ambient temperature are acceptable.
4. Prepare test report to record the following information for each test:

a. Name of person starting test, company name, phone number, and e-mail address.
b. Name of manufacturer's service representative witnessing test, company name, phone number, and e-mail address.
c. Detailed description of extent of tubing tested.
d. Date and time at start of test.
e. Test pressure at start of test.
f. Outdoor temperature at start of test.
g. Name of person ending test, company name, phone number, and e-mail address.
h. Date and time at end of test.
i. Test pressure at end of test.
j. Outdoor temperature at end of test.
k. Remarks:

5. Submit test reports for Project record.

D. Refrigerant Tubing Evacuation Testing:

1. Comply with more stringent of VRF HVAC system manufacturer's requirements and requirements indicated.
2. After completion of tubing positive-pressure testing, evacuate tubing systems to a pressure of 500 microns.
3. Successful testing shall maintain a test pressure for a continuous and uninterrupted period of one hour with no change.
4. Prepare test report to record the following information for each test:

    a. Name of person starting test, company name, phone number, and e-mail address.
    b. Name of manufacturer's service representative witnessing test, company name, phone number, and e-mail address.
    c. Detailed description of extent of tubing tested.
    d. Date and time at start of test.
    e. Test pressure at start of test.
    f. Outdoor temperature at start of test.
    g. Name of person ending test, company name, phone number, and e-mail address.
    h. Date and time at end of test.
    i. Test pressure at end of test.
    j. Outdoor temperature at end of test.
    k. Remarks:

5. Submit test reports for Project record.
6. Upon successful completion of evacuation testing, system shall be charged with refrigerant.

E. System Refrigerant Charge:

1. Using information collected from the refrigerant tubing evacuation testing, system Installer shall consult variable refrigerant system manufacturer to determine the correct system refrigerant charge.
2. Installer shall charge system following VRF HVAC system manufacturer's written instructions.
3. System refrigerant charging shall be witnessed by system manufacturer's representative.
4. Total refrigerant charge shall be recorded and permanently displayed at the system's outdoor unit.

F. Products will be considered defective if they do not pass tests and inspections.

G. Prepare test and inspection reports.

3.12 STARTUP SERVICE

A. Engage a VRF HVAC system manufacturer's service representative to perform system(s) startup service.

1. Service representative shall be a factory-trained and -authorized service representative of VRF HVAC system manufacturer.
2. Complete startup service of each separate system.
3. Complete system startup service according to manufacturer's written instructions.

B. Startup checks shall include, but not be limited to, the following:

1. Check control communications of equipment and each operating component in system(s).
2. Check each indoor unit's response to demand for cooling and heating.
3. Check each indoor unit's response to changes in airflow settings.
4. Check each indoor unit and outdoor unit for proper condensate removal.
5. Check sound levels of each indoor and outdoor unit.

C. Installer shall accompany manufacturer's service representative during startup service and provide manufacturer's service representative with requested documentation and technical support during startup service.

1. Installer shall correct deficiencies found during startup service for reverification.

D. System Operation Report:

1. After completion of startup service, manufacturer shall issue a report for each separate system.
2. Report shall include complete documentation describing each startup check, the result, and any corrective action required.
3. Manufacturer shall electronically record not less than two hours of continuous operation of each system and submit with report for historical reference.

a. All available system operating parameters shall be included in the information submitted.

3.13 ADJUSTING

A. Adjust equipment and components to function smoothly, and lubricate as recommended by manufacturer.

B. Adjust initial temperature and humidity set points. Adjust initial airflow settings and discharge airflow patterns.

C. Set field-adjustable switches and circuit-breaker trip ranges according to VRF HVAC system manufacturer's written instructions, and as indicated.

D. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.14 PROTECTION

A. Protect products from moisture and water damage. Remove and replace products that are wet, moisture damaged, or mold damaged.

B. Protect equipment from physical damage. Replace equipment with physical damage that cannot be repaired to new condition. Observable surface imperfections shall be grounds for removal and replacement.

C. Protect equipment from electrical damage. Replace equipment suffering electrical damage.

D. Cover and seal openings of equipment to keep inside of equipment clean. Do not remove covers until finish work is complete.

3.15 SOFTWARE SERVICE AGREEMENT

A. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.

B. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.

3.16 DEMONSTRATION

A. Engage a VRF HVAC system manufacturer's employed training instructor or factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain entire system.

B. Schedule and Duration:

1. Schedule training with Owner at least 10 business days before first training session.
2. Training shall occur before Owner occupancy.
3. Training shall be held at mutually agreed date and time during normal business hours.

C. Training Format: Individual training modules shall include classroom training followed by hands-on field demonstration and training.

D. Training Materials: Provide training materials in electronic format to each attendee.

1. Include instructional videos showing general operation and maintenance that are coordinated with operation and maintenance manuals.

E. Acceptance: Obtain Owner written acceptance that training is complete and requirements indicated have been satisfied.

END OF SECTION 238129

SECTION 238223 - UNIT VENTILATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes unit ventilators and accessories with the following heating and cooling features:

1. Hydronic heating coil.
2. Direct-expansion (DX) refrigerant cooling coil.
3. For DX coil control see Section 238129 – Variable-Refrigerant-Flow HVAC Systems.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product

1. Include rated capacities, operating characteristics, and furnished specialties and accessories for each unit type and configuration.

B. Shop Drawings:

1. Include plans, elevations, sections, and details.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Detail anchorages and attachments to structure and to supported equipment.
4. Include diagrams for power, signal, and control wiring.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For unit ventilators to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

a. Maintenance schedules and repair part lists for motors, coils, integral controls, and filters.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Unit Ventilator Filters: Furnish 1 spare filter(s) for each filter installed.

1.6 QUALITY ASSURANCE

A. Comply with NFPA 70.

B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."

C. ASHRAE/IES 90.1 Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."

1.7 COORDINATION

A. Coordinate layout and installation of unit ventilators and suspension system components with other construction that penetrates or is supported by ceilings, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.

B. Coordinate size and location of unit with existing wall sleeves and outdoor-air intake louvers.

1.8 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of condensing units that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Direct expansion coil leak.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Factory-packaged and -tested units rated according to AHRI 840, ASHRAE 33, and UL 1995.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Trane
2. Carrier Corporation; a unit of United Technologies Corp.
3. Daikin.

2.3 CABINETS

A. Insulation: Minimum 1/2-inch- thick, coated glass fiber complying with ASTM C 1071 and attached with adhesive complying with ASTM C 916.

1. Surface-Burning Characteristics: Insulation and adhesive shall have a combined maximum flame-spread index of 25 and smoke-developed index of 50 when tested according to ASTM E 84 by a qualified testing agency.
2. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

B. Coil Section Insulation: Insulate coil section according to Section 230616 "HVAC Equipment Insulation."

1. Surface-Burning Characteristics: Insulation and adhesive shall have a combined maximum flame-spread index of 25 and smoke-developed index of 50 when tested according to ASTM E 84 by a qualified testing agency.
2. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

C. Main and Auxiliary Drain Pans: Insulated galvanized steel with plastic liner, formed as required by ASHRAE 62.1. Drain pans shall be removable.

D. Cabinet Frame and Access Panels: Welded-steel frame with removable panels fastened with hex-head tamperproof fasteners and key-operated control and valve access doors.

1. Steel components exposed to moisture shall be powder-coat finished.

E. Cabinet Finish: Powder coat, in manufacturer's standard color as selected by Architect.

F. Indoor-Supply-Air Grille: Aluminum, adjustable linear bar.

G. Return-Air Inlet: Front toe space, unless otherwise indicated.

H. End Panels: Matching material and finish of unit ventilator.

2.4 COILS

A. Test and rate unit ventilator coils according to ASHRAE 33.

B. Hydronic Coils: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch, rated for a minimum working pressure of 200 psig and a maximum entering-water temperature of 220 deg F. Include manual air vent and drain valve.

C. Indoor Refrigerant Coils: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch, and brazed joints at fittings. Comply with AHRI 210/240, and leak test to minimum 450 psig for a minimum 300-psig working pressure. Include thermal expansion valve.

2.5 INDOOR FAN

A. Fan and Motor Board: Removable.

1. Fan: Forward curved, double width, centrifugal; directly connected to motor. Thermoplastic or painted-steel wheels, and aluminum, painted-steel, or galvanized-steel fan scrolls.
2. Fan Shaft and Bearings: Hollow-steel shaft with permanently lubricated, resiliently mounted bearings.
3. Motor: Permanently lubricated, ECM motor, resiliently mounted on motor board. Comply with requirements in Section 230513 "Common Motor Requirements for HVAC Equipment."
4. Wiring Termination: Connect motor to chassis wiring with plug connection.

2.6 DAMPERS

A. Mixing Dampers: Galvanized-steel blades with edge and end seals and nylon bearings; with electric actuator.

B. Outdoor-Air Dampers: Galvanized-steel blades with edge and end seals and nylon bearings; with electric actuator.

C. Face and Bypass Dampers: Galvanized-steel damper blades with edge and end seals and nylon bearings; with factory-mounted electric actuator.

D. Dampers and damper actuators shall be factory provided and mounted.

E. Comply with ASHRAE/IES 90.1.

2.7 ACCESSORIES

A. Subbase: Sheet metal floor-mounting base with leveling screws and black enamel finish.

B. Insulated false back with gasket seals on wall and outdoor-air plenum.

1. Insulation: Minimum 1/2-inch- thick, coated glass fiber complying with ASTM C 1071 and attached with adhesive complying with ASTM C 916.

a. Surface-Burning Characteristics: Insulation and adhesive shall have a combined maximum flame-spread index of 25 and smoke-developed index of 50 when tested according to ASTM E 84 by a qualified testing agency.
b. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

C. Duct flanges for supply-, return-, and outdoor-air connections.

D. Filters: Minimum arrestance and a minimum efficiency reporting value (MERV) according to ASHRAE 52.2 and all addendums.

1. Glass Fiber Treated with Adhesive: 80 percent arrestance and MERV 8.

E. Where scheduled, provide airflow measuring device to be field installed after face and bypass coil. Device shall measure airflow and send a signal to the unit ventilator control board for ECM motor control of the supply fan.

2.8 HYDRONIC PIPING

A. Piping: ASTM B 88, Type L copper tube with wrought-copper fittings and brazed joints. Label piping to indicate service, inlet, and outlet. Crossover piping, NPS 1-1/2 with shutoff valves.

B. Control Valves: Provided by Temperature Controls contract.

1. Two-way, modulating control valve for hot-water coil.

2. Provide isolation valves for supply and return piping connections.

C. Isolation Valves, Strainers, Unions, and Balance Valves:

1. Two-Piece Ball Valves: Bronze body with stainless-steel ball and stem and galvanized-steel lever handle for each supply and return connection. If balancing device is combination shutoff type with memory stop, isolation valve may be omitted on the return.
2. Calibrated-Orifice Balancing Valves: Bronze body, ball type; 125-psig working pressure, 250 deg F maximum operating temperature; with calibrated orifice or venturi, connections for portable differential pressure meter with integral seals, threaded ends, and a memory stop to retain set position.

2.9 LINEAR EXPANSION VALVE (LEV) PACKAGE

A. For unit vents providing cooling, provide a linear expansion valve and control box interface to connect the unit ventilator to the variable refrigerant flow system and corresponding outdoor condensing unit.

1. The LEV package shall control room temperature by setting the valve opening to a standard opening set for each operation frequency of its associated compressor.
2. The LEV valve shall provide defrost control.
3. The LEV package shall meet design capacity of its associated unit ventilator.
4. Provide suction line and liquid line thermistor.
5. Provide supply air and return air thermistor.

2.10 BASIC UNIT CONTROLS

A. Control devices and operational sequences are specified on drawings and in Section 238129 – Variable-Refrigerant-Flow HVAC Systems (for cooling units).

B. Building Automation System (BAS) Interface Requirements:

1. Interface relay for scheduled operation.
2. Interface relay to provide indication of fault at the central workstation.
3. Provide BACnet interface for central BAS workstation for the following functions:

a. Adjust set points.
b. Unit ventilator start, stop, and operating status.
c. Data inquiry to include outdoor-air damper position, supply- and room-air temperature.
d. Occupied and unoccupied schedules.

C. Electrical Connection: Factory wire motors and controls for a single electrical connection.

2.11 METAL PIPING COMPARTMENTS AND FILLER PIECES

A. Include manufacturer's standard cabinets to match unit ventilators with required installation hardware as indicated:

1. Utility compartment with access panel with key-operated lock.
2. Wall and corner filler sections, and end panels finished to match shelving.

B. Painted Finish: Manufacturer's standard baked enamel, in color selected by Architect, applied before shipping.

C. Coordinate compartment size to house Linear Expansion Valve (LEV) Package.

2.12 CAPACITIES AND CHARACTERISTICS – See Schedules

A. Electrical Characteristics for Single-Point Connection: See Schedules.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, to receive unit ventilators for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for piping and electrical connections to verify actual locations before unit ventilator installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install unit ventilators to comply with NFPA 90A.

B. Suspend horizontal unit ventilators from structure with threaded steel rods and minimum 1.0-inch static-deflection spring hangers. Vibration isolators are specified in Section 230548 "Vibration and Seismic Controls for HVAC Piping and Equipment."

C. Verify location of thermostats and other exposed control sensors with Drawings and room details before installation. Install devices 48 inches above finished floor, unless otherwise noted.

D. Set remote controller type to refrigerant system (Mitsubishi) controller and coil selected for ventilation application.

E. Integrate fan control.

3.3 CONNECTIONS

A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties. Specific connection requirements are as follows:

1. Install piping adjacent to machine to allow service and maintenance.
2. Connect piping to unit ventilator factory hydronic piping package. Install piping package if shipped loose.
3. Connect condensate drain to indirect waste as indicated.

B. Install refrigerant piping as required by Section 232300 "Refrigerant Piping," and add refrigerant as required to compensate for length of piping.

1. Provide brazed connection to LEV valve and control connections and power to LEV control box.

2. Follow manufacturer’s written installation instruction including maximum distances between valve and control box.

C. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."

D. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
2. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

C. Remove and replace malfunctioning units and retest as specified above.

D. Prepare test and inspection reports.

3.5 ADJUSTING

A. Adjust initial temperature set points.

B. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.6 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain unit ventilators.

END OF SECTION 238223

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Copper building wire rated 600 V or less.
2. Metal-clad cable, Type MC, rated 600 V or less.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Belden Inc.
2. General Cable Technologies Corporation.
3. Okonite Company (The).
4. Southwire Company.

C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. RoHS compliant.

3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

E. Conductor Insulation:

1. Type THHN and Type THWN-2: Comply with UL 83.

2.2 METAL-CLAD CABLE, TYPE MC

A. Description: A factory assembly of one or more current-carrying insulated conductors in an overall metallic sheath.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Belden Inc.
2. General Cable Technologies Corporation.
3. Okonite Company (The).
4. Southwire Company.

C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. Comply with UL 1569.
3. RoHS compliant.
4. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Circuits:

1. Single circuit.

E. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

F. Ground Conductor: Insulated.

G. Conductor Insulation:

1. Type TFN/THHN/THWN-2: Comply with UL 83.

H. Armor: Steel or Aluminum, interlocked.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Branch Circuits: Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Exposed Branch Circuits, Including in Crawlspaces: Type THHN/THWN-2, single conductors in raceway Metal-clad cable, Type MC.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

END OF SECTION 260519

SECTION 260523 - CONTROL-VOLTAGE ELECTRICAL POWER CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Control cabling.
2. Control-circuit conductors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Flame Travel and Smoke Density in Plenums: As determined by testing identical products according to NFPA 262, by a qualified testing agency. Identify products for installation in plenums with appropriate markings of applicable testing agency.

1. Flame Travel Distance: 60 inch or less.
2. Peak Optical Smoke Density: 0.5 or less.
3. Average Optical Smoke Density: 0.15 or less.

2.2 CONTROL CABLE

A. Plenum-Rated, Paired Cable: NFPA 70, Type CMP.

1. One or multi-pair, twisted, No. 16 AWG, stranded (19x29) tinned-copper conductors. as needed
2. PVC insulation.
3. Unshielded.
4. PVC jacket.
5. Flame Resistance: Comply with NFPA 262.
6. Lead Content: Less than 300 parts per million.

2.3 CONTROL-CIRCUIT CONDUCTORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Encore Wire Corporation.
2. General Cable; General Cable Corporation.
3. Service Wire Co.
4. Southwire Company.

B. Class 2 Control Circuits: Stranded copper, Type THHN/THWN-2, complying with UL 83 in raceway.

C. Class 3 Remote-Control and Signal Circuits: Stranded copper, Type THHN/THWN-2, complying with UL 83 in raceway.

2.4 FIRE-ALARM WIRE AND CABLE

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Allied Wire & Cable Inc.
2. CommScope, Inc.
3. Genesis Cable Products; Honeywell International, Inc.
4. Superior Essex Inc.

B. General Wire and Cable Requirements: NRTL listed and labeled as complying with NFPA 70, Article 760.

1. Lead Content: Less than 300 parts per million.

C. Signaling Line Circuits: Twisted, shielded pair, not less than No. 18 AWG .

PART 3 - EXECUTION

3.1 EXAMINATION

A. Test cables on receipt at Project site.

1. Test each pair of twisted pair cable for open and short circuits.

3.2 INSTALLATION OF RACEWAYS AND BOXES

A. Comply with requirements in Section 260533 "Raceways and Boxes for Electrical Systems" for raceway selection and installation requirements for boxes, conduits, and wireways as supplemented or modified in this Section.

1. Outlet boxes must be no smaller than 2 inch wide, 3 inch high, and 2-1/2 inch deep.
2. Flexible metal conduit must not be used.

B. Comply with TIA-569-D for pull-box sizing and length of conduit and number of bends between pull points.

C. Install manufactured conduit sweeps and long-radius elbows if possible.

D. Raceway Installation in Equipment Rooms:

1. Position conduit ends adjacent to a corner on backboard if a single piece of plywood is installed, or in the corner of the room if multiple sheets of plywood are installed around perimeter walls of the room.
2. Install cable trays to route cables if conduits cannot be located in these positions.
3. Secure conduits to backboard if entering the room from overhead.
4. Extend conduits 3 inch above finished floor.
5. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:

1. Comply with TIA-568-C Series of standards.
2. Comply with BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems."
3. Terminate all conductors; cable must not contain unterminated elements. Make terminations only at indicated outlets, terminals, and cross-connect and patch panels.
4. Cables may not be spliced and must be continuous from terminal to terminal. Do not splice cable between termination, tap, or junction points.
5. Cables serving a common system may be grouped in a common raceway. Install network cabling and control wiring and cable in separate raceway from power wiring. Do not group conductors from different systems or different voltages.
6. Secure and support cables at intervals not exceeding 30 inch and not more than 6 inch from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems." Install lacing bars and distribution spools.

8. Do not install bruised, kinked, scored, deformed or abraded cable. Remove and discard cable if damaged during installation and replace it with new cable.
9. Cold-Weather Installation: Bring cable to room temperature before drilling. Do not use heat lamps for heating.
10. Pulling Cable: Comply with BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems." Monitor cable pull tensions.
11. Support: Do not allow cables to lay on removable ceiling tiles.
12. Secure: Fasten securely in place with hardware specifically designed and installed so as to not damage cables.
13. Provide strain relief.
14. Keep runs short. Allow extra length for connecting to terminals. Do not bend cables in a radius less than 10 times the cable OD. Use sleeves or grommets to protect cables from vibration at points where they pass around sharp corners and through penetrations.
15. Ground wire must be copper, and grounding methods must comply with IEEE C2. Demonstrate ground resistance.

C. Balanced Twisted Pair Cable Installation:

1. Comply with TIA-568-C.2.
2. Install termination hardware as specified in Section 271513 "Communications Copper Horizontal Cabling" unless otherwise indicated.
3. Do not untwist UTP cables more than 1/2 inch at the point of termination to maintain cable geometry.

D. Installation of Control-Circuit Conductors:

1. Install wiring in raceways. Comply with requirements specified in Section 260533 "Raceways and Boxes for Electrical Systems."

E. Open-Cable Installation:

1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
2. Suspend copper cable not in a wireway or pathway a minimum of 8 inch above ceilings by cable supports not more than 30 inch apart.
3. Cable must not be run through or on structural members or in contact with pipes, ducts, or other potentially damaging items. Do not run cables between structural members and corrugated panels.

F. Installation of Cable Routed Exposed under Raised Floors:

1. Install plenum-rated cable only.
2. Install cabling after the flooring system has been installed in raised floor areas.
3. Below each feed point, neatly coil a minimum of 72 inch of cable in a coil not less than 12 inch in diameter.

3.4 REMOVAL OF CONDUCTORS AND CABLES

A. Remove abandoned conductors and cables. Abandoned conductors and cables are those installed that are not terminated at equipment and are not identified with a tag for future use.

3.5 CONTROL-CIRCUIT CONDUCTORS

A. Minimum Conductor Sizes:

1. Class 2 low-energy, remote-control, and signal circuits; No. 16 AWG .
2. Class 3 low-energy, remote-control, alarm, and signal circuits; No 12 AWG .

3.6 FIRESTOPPING

A. Comply with requirements in Section 078413 "Penetration Firestopping."

3.7 GROUNDING

A. For data communication wiring, comply with TIA-607-B and with BICSI TDMM, "Bonding and Grounding (Earthing)" Chapter.

B. For control-voltage wiring and cabling, comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems."

3.8 IDENTIFICATION

A. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

B. Identify data and communications system components, wiring, and cabling according to TIA-606-B; label printers must use label stocks, laminating adhesives, and inks complying with UL 969.

C. Identify each wire on each end and at each terminal with a number-coded identification tag. Each wire must have a unique tag.

END OF SECTION 260523

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes grounding and bonding systems and equipment, plus the following special applications:

1. Underground distribution grounding.
2. Foundation steel electrodes.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans showing dimensioned locations of grounding features specified in "Field Quality Control" Article, including the following:

1. Ground rods.
2. Grounding arrangements and connections for separately derived systems.

B. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 CONDUCTORS

A. Bare Copper Conductors:

1. Solid Conductors: ASTM B3.
2. Stranded Conductors: ASTM B8.

B. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inch in cross section, with holes spaced 1-1/8 inch apart. Stand-off insulators for mounting must comply with UL 891 for use in switchboards, 600 V and must be Lexan or PVC, impulse tested at 5000 V.

2.3 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

C. Mechanical-Type Bus-Bar Connectors: Cast silicon bronze, solderless compression - type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

D. Compression-Type Bus-Bar Connectors: Copper or copper alloy, with two wire terminals.

E. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.

F. Cable-to-Cable Connectors: Compression type, copper or copper alloy.

G. Cable Tray Ground Clamp: Mechanical type, zinc-plated malleable iron.

H. Conduit Hubs: Mechanical type, terminal with threaded hub.

I. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex head bolt.

J. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex head bolt.

K. Lay-in Lug Connector: Mechanical type, copper rated for direct burial terminal with set screw.

L. Service Post Connectors: Mechanical type, bronze alloy terminal, in short- and long-stud lengths, capable of single and double conductor connections.

M. Signal Reference Grid Clamp: Mechanical type, stamped-steel terminal with hex head screw.

N. Straps: Solid copper, copper lugs. Rated for 600 A.

O. Tower Ground Clamps: Mechanical type, copper or copper alloy, terminal two-piece clamp.

P. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.

Q. Water Pipe Clamps:

1. Mechanical type, two pieces with zinc-plated bolts.
   a. Material: Tin-plated aluminum.
   b. Listed for direct burial.
2. U-bolt type with malleable-iron clamp and copper ground connector rated for direct burial.

2.4 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel; 3/4 inch by 10 ft..

B. Ground Plates: 1/4 inch thick, hot-dip galvanized.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Underground Grounding Conductors: Install bare copper conductor, #8 AWG minimum.

1. Bury at least 30 inch below grade.

C. Grounding Conductors: Green-colored insulation with continuous yellow stripe.

D. Isolated Grounding Conductors: Green-colored insulation with more than one continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

E. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Install bus horizontally, on insulated spacers 2 inch minimum from wall, 6 inch above finished floor unless otherwise indicated.
2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.

F. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING AT THE SERVICE

A. Equipment grounding conductors and grounding electrode conductors must be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 GROUNDING SEPARATELY DERIVED SYSTEMS

A. Generator: Install grounding electrode(s) at the generator location. The electrode must be connected to the equipment grounding conductor and to the frame of the generator.

3.4 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Comply with IEEE C2 grounding requirements.

3.5 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

3.6 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.

C. Ground Rods: Drive rods until tops are 2 inch below finished floor or final grade unless otherwise indicated.

1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
2. Use exothermic welds for all below-grade connections.

D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
2. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

E. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in 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.

3.7 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. After installing the pool grounding system, test for compliance with the following requirements. Test shall be performed before and after burial and slab installation.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
3. Test completed grounding system at each connection point and record the readings. Ensure meter is zeroed out with the test leads attached prior to performing testing.
    a. Measure ground the resistance from any point to the ground bar shall be less than 2 ohms.
    b. The resistance between any 2 points and the ground bar shall not differ by more than 1 ohm.
4. Prepare dimensioned Drawings showing the location of all grounding points and the ground resistance reading back to the ground bar.

B. Grounding system will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION 260526

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Steel slotted support systems.
2. Aluminum slotted support systems.
3. Conduit and cable support devices.
4. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.

B. Related Requirements:

1. Section 260548.16 "Seismic Controls for Electrical Systems" for products and installation requirements necessary for compliance with seismic criteria.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
   a. Slotted support systems, hardware, and accessories.
   b. Clamps.
   c. Hangers.
   d. Sockets.
   e. Eye nuts.
   f. Fasteners.
   g. Anchors.
   h. Saddles.
   i. Brackets.
2. Include rated capacities and furnished specialties and accessories.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch- diameter holes at a maximum of 8 inches o.c. in at least one surface.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allied Tube & Conduit; a part of Atkore International.
   b. G-Strut.
   c. Thomas & Betts Corporation; A Member of the ABB Group.
   d. Unistrut; Part of Atkore International.
2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
3. Material for Channel, Fittings, and Accessories: Galvanized steel .
4. Channel Width: Selected for applicable load criteria .
5. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
6. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
7. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Aluminum Slotted Support Systems: Extruded-aluminum channels and angles with minimum 13/32-inch- diameter holes at a maximum of 8 inches o.c. in at least one surface.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Flex-Strut Inc.
   b. Thomas & Betts Corporation; A Member of the ABB Group.
   c. Unistrut; Part of Atkore International.
2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
3. Channel Material: 6063-T5 aluminum alloy.
4. Fittings and Accessories Material: 5052-H32 aluminum alloy.
5. Channel Width: Selected for applicable load criteria <**Insert dimension>**.
6. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
7. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

D. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
2. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
3. Hanger Rods: Threaded steel.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:

1. NECA 1.
2. NECA 101
3. NECA 102.
4. NECA 105.
5. NECA 111.

B. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.

C. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."

D. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and RMC as scheduled in NECA 1, where its Table 1 lists maximum spacings that are less than those stated in NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

E. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with two-bolt conduit clamps.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT IMC and RMC may be supported by openings through structure members, according to NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
3. To Existing Concrete: Expansion anchor fasteners.
4. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Section 055000 "Metal Fabrications" for site-fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

END OF SECTION 260529

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Type EMT-A and Type EMT-SS raceways and elbows.
2. Type EMT-S raceways and elbows.
3. Type ERMC-SS raceways, elbows, couplings, and nipples.
4. Type ERMC-S raceways, elbows, couplings, and nipples.
5. Type FMC-S and Type FMC-A raceways.
6. Type LFMC raceways.
7. Type PVC raceways and fittings.
8. Fittings for conduit, tubing, and cable.
9. Metallic outlet boxes, device boxes, and covers.
10. Cabinets, cutout boxes, junction boxes, and pull boxes.
11. Cover plates for device boxes.
12. Hoods for outlet boxes.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Wireways and auxiliary gutters.
2. Surface metal raceways.
3. Floor boxes.
4. Cabinets and cutout boxes.

PART 2 - PRODUCTS

2.1 TYPE EMT-A AND TYPE EMT-SS RACEWAYS AND ELBOWS

A. Aluminum Electrical Metal Tubing (EMT-A) and Elbows:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Norsk Hydro ASA (Hydro Extrusion USA, LLC - American Conduit).
   b. Patriot Aluminum Products, LLC.
2. Applicable Standards:

a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
b. General Characteristics:
1) Reference Standards: UL 797A and UL Category Control Number FJMX.
2) Material: Aluminum.
c. Options:
1) Minimum Trade Size: 3/4 inch.
2) Colors: As indicated on Drawings.

B. Stainless Steel Electrical Metal Tubing (EMT-SS) and Elbows:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Atkore International (Calconduit).
2. Applicable Standards:
a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
b. General Characteristics:
1) Reference Standards: UL 797A and UL Category Control Number FJMX.
2) Material: Stainless steel.
c. Options:
1) Minimum Trade Size: 3/4 inch.
2) Colors: As indicated on Drawings.

2.2 TYPE EMT-S RACEWAYS AND ELBOWS

A. Steel Electrical Metal Tubing (EMT-S) and Elbows:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Atkore International (Allied Tube & Conduit).
b. Atkore International (Calconduit).
c. Topaz Lighting & Electric.
d. Zekelman Industries (Picoma).
2. Applicable Standards:
a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
b. General Characteristics:
1) Reference Standards: UL 797 and UL Category Control Number FJMX.
2) Material: Steel.
3) Exterior Coating: Zinc.
4) Interior Coating: Zinc.
c. Options:

1) Minimum Trade Size: 3/4 inch.
2) Colors: As indicated on Drawings.

2.3 TYPE ERMC-SS RACEWAYS, ELBOWS, COUPLINGS, AND NIPPLES

A. Stainless Steel Electrical Rigid Metal Conduit (ERMC-SS), Elbows, Couplings, and Nipples:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. ABB (Electrification Products Division).
   b. Atkore International (Allied Tube & Conduit).
   c. Eaton (Crouse-Hinds).
2. Applicable Standards:
   a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   b. General Characteristics:
      1) Reference Standards: UL 6A and UL Category Control Number DYWV.
      2) Material: Stainless steel.
   c. Options:
      1) Minimum Trade Size: 3/4 inch.
      2) Colors: As indicated on Drawings.

2.4 TYPE ERMC-S RACEWAYS, ELBOWS, COUPLINGS, AND NIPPLES

A. Galvanized-Steel Electrical Rigid Metal Conduit (ERMC-S-G), Elbows, Couplings, and Nipples:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Atkore International (Allied Tube & Conduit).
   b. Eaton (Crouse-Hinds).
   c. Topaz Lighting & Electric.
2. Applicable Standards:
   a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   b. General Characteristics:
      1) Reference Standards: UL 6 and UL Category Control Number DYIX.
      2) Exterior Coating: Zinc.
      3) Interior Coating: Zinc with organic top coating Zinc.
   c. Options:
      1) Minimum Trade Size: 3/4 inch.
      2) Colors: As indicated on Drawings.

2.5 TYPE FMC-S AND TYPE FMC-A RACEWAYS

A. Steel Flexible Metal Conduit (FMC-S):

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. ABB (Electrification Products Division).
   b. Electri-Flex Company.
   c. Topaz Lighting & Electric.
2. Applicable Standards:
   a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   b. General Characteristics:
      1) Reference Standard: UL 1 and UL Category Control Number DXUZ.
      2) Material: Steel.
   c. Options:
      1) Minimum Trade Size: 3/4 inch.
      2) Colors: As indicated on Drawings.

2.6 TYPE LFMC RACEWAYS

A. Steel Liquidtight Flexible Metal Conduit (LFMC-S):

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. ABB (Electrification Products Division).
   b. Anamet Electrical, Inc (Anaconda Sealtite).
   c. Electri-Flex Company.
2. Applicable Standards:
   a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   b. General Characteristics:
      1) Reference Standard: UL 360 and UL Category Control Number DXHR.
      2) Material: Steel.
   c. Options:
      1) Minimum Trade Size: 3/4 inch.
3. Colors: As indicated on Drawings.

B. Stainless Steel Liquidtight Flexible Metal Conduit (LFMC-SS):

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Electri-Flex Company.
2. Applicable Standards:

a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
b. General Characteristics:
1) Reference Standard: UL 360 and UL Category Control Number DXHR.
2) Material: Stainless steel.
c. Options:
1) Minimum Trade Size: 3/4 inch.
3. Colors: As indicated on Drawings.

2.7 TYPE PVC RACEWAYS AND FITTINGS

A. Schedule 80 Rigid PVC Conduit (PVC-80) and Fittings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. ABB (Electrification Products Division).
b. Atkore International (Calconduit).
c. Topaz Lighting & Electric.
2. Applicable Standards:
a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
b. General Characteristics:
1) Reference Standards: UL 651 and UL Category Control Number DZYR.
2) Dimensional Specifications: Schedule 80.
c. Options:
1) Minimum Trade Size: 3/4 inch.
2) Markings: For use with maximum 90 deg C wire. For directional boring applications.

B. Type A Rigid PVC Concrete-Encased Conduit (PVC-A) and Fittings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Southern Pipe, Inc.
2. Applicable Standards:
a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
b. General Characteristics:
1) Reference Standards: UL 651 and UL Category Control Number DZYR.
2) Dimensional Specifications: Type A.
c. Options:
1) Minimum Trade Size: 3/4 inch.

2.8 FITTINGS FOR CONDUIT, TUBING, AND CABLE

A. Fittings for Type ERMC, Type IMC, and Type PVC Raceways:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. ABB (Electrification Products Division).
   b. Appleton - O-Z/Gedney; Emerson Electric Co., Automation Solutions.
   c. Eaton (Crouse-Hinds).
2. Applicable Standards:
   a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   b. General Characteristics:
      1) Reference Standards: UL 514B and UL Category Control Number DWTT.
      2) Material: Steel.
      3) Coupling Method: Compression coupling.
   c. Options:
      1) Conduit Fittings for Hazardous (Classified) Locations: UL 1203.
      2) Expansion and Deflection Fittings: UL 651 with flexible external bonding jumper.

B. Fittings for Type EMT Raceways:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. ABB (Electrification Products Division).
   b. Appleton - O-Z/Gedney; Emerson Electric Co., Automation Solutions.
   c. Eaton (Crouse-Hinds).
2. Applicable Standards:
   a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   b. General Characteristics:
      1) Reference Standards: UL 514B and UL Category Control Number FKAV.
      2) Material: Steel.
      3) Coupling Method: Compression coupling or Setscrew coupling. Setscrew couplings with only single screw per conduit are unacceptable.
   c. Options:
      1) Conduit Fittings for Hazardous (Classified) Locations: UL 1203.
      2) Expansion and Deflection Fittings: UL 651 with flexible external bonding jumper.

C. Fittings for Type FMC Raceways:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. American Fittings Corp. (AMFICO).
   b. Liquid Tight Connector Co.
   c. Southwire Company.
2. Applicable Standards:
   a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   b. General Characteristics:
      1) Reference Standards: UL 514B and UL Category Control Number ILNR.

D. Fittings for Type LFMC Raceways:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Liquid Tight Connector Co.
2. Applicable Standards:
   a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   b. General Characteristics:
      1) Reference Standards: UL 514B and UL Category Control Number DXAS.

2.9 METALLIC OUTLET BOXES, DEVICE BOXES, AND COVERS

A. Metallic Outlet Boxes:

1. Description: Box having pryout openings, knockouts, threaded entries, or hubs in either the sides of the back, or both, for entrance of conduit, conduit or cable fittings, or cables, with provisions for mounting outlet box cover, but without provisions for mounting wiring device directly to box.
2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. ABB (Electrification Products Division).
   b. Appleton - O-Z/Gedney; Emerson Electric Co., Automation Solutions.
   c. Eaton (Crouse-Hinds).
3. Applicable Standards:
   a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   b. General Characteristics:
      1) Reference Standards: UL 514A and UL Category Control Number QCIT.
   c. Options:
      1) Material: Sheet steel or sheet aluminum .

2) Luminaire Outlet Boxes and Covers: Nonadjustable, listed and labeled for attachment of luminaire weighing up to 50 lb..
3) Paddle Fan Outlet Boxes and Covers: Nonadjustable, designed for attachment of paddle fan weighing up to 70 lb.

B. Metallic Conduit Bodies:

1. Description: Means for providing access to interior of conduit or tubing system through one or more removable covers at junction or terminal point. In the United States, conduit bodies are listed in accordance with outlet box requirements.
2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. ABB (Electrification Products Division).
   b. Appleton - O-Z/Gedney; Emerson Electric Co., Automation Solutions.
   c. Eaton (Crouse-Hinds).
3. Applicable Standards:
   a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   b. General Characteristics:
      1) Reference Standards: UL 514A and UL Category Control Number QCIT.

C. Metallic Device Boxes:

1. Description: Box with provisions for mounting wiring device directly to box.
2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. ABB (Electrification Products Division).
   b. Appleton - O-Z/Gedney; Emerson Electric Co., Automation Solutions.
   c. Eaton (Crouse-Hinds).
3. Applicable Standards:
   a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   b. General Characteristics:
      1) Reference Standards: UL 514A and UL Category Control Number QCIT.
   c. Options:
      1) Material: Sheet steel Sheet aluminum.
      2) Luminaire Outlet Boxes and Covers: Nonadjustable, listed and labeled for attachment of luminaire weighing up to 50 lb..
      3) Paddle Fan Outlet Boxes and Covers: Nonadjustable, designed for attachment of paddle fan weighing up to 70 lb.

2.10 CABINETS, CUTOUT BOXES, JUNCTION BOXES, AND PULL BOXES

A. Indoor Sheet Metal Junction and Pull Boxes:

1. Description: Box with a blank cover that serves the purpose of joining different runs of raceway or cable.
2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Appleton - O-Z/Gedney; Emerson Electric Co., Automation Solutions.
   b. Raco Taymac Bell; Hubbell Incorporated, Commercial and Industrial.
   c. Wiring Device-Kellems; Hubbell Incorporated, Commercial and Industrial.
3. Applicable Standards:
   a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   b. General Characteristics:
      1) Reference Standards: UL Category Control Number BGUZ.
         a) Non-Environmental Characteristics: UL 50.
         b) Environmental Characteristics: UL 50E.
   c. Options:
      1) Degree of Protection: Type 1.

2.11 COVER PLATES FOR DEVICES BOXES

A. Metallic Cover Plates for Device Boxes:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. ABB (Electrification Products Division).
   b. Appleton - O-Z/Gedney; Emerson Electric Co., Automation Solutions.
   c. Eaton (Crouse-Hinds).
2. Applicable Standards:
   a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   b. General Characteristics:
      1) Reference Standards: UL 514D and UL Category Control Numbers QCIT and QCMZ.
      2) Wallplate-Securing Screws: Metal with head color to match wallplate finish.
   c. Options:
      1) Damp and Wet Locations: Listed, labeled, and marked for location and use. Provide gaskets and accessories necessary for compliance with listing.
      2) Wallplate Material: 0.032 inch thick Type 302/304 non-magnetic stainless steel with brushed finish.

B. Nonmetallic Cover Plates for Device Boxes:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. ABB (Electrification Products Division).
b. Appleton - O-Z/Gedney; Emerson Electric Co., Automation Solutions.
c. Eaton (Crouse-Hinds).

2. Applicable Standards:
   a. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
   b. General Characteristics:
      1) Reference Standards: UL 514D and UL Category Control Numbers QCIT and QCMZ.
      2) Wallplate-Securing Screws: Metal with head color to match wallplate finish.
   c. Options:
      1) Damp and Wet Locations: Listed, labeled, and marked for location and use. Provide gaskets and accessories necessary for compliance with listing.
      2) Wallplate Material: 0.060 inch thick high-impact thermoplastic (nylon) with smooth finish and color matching wiring device.
      3) Color: White.

PART 3 - EXECUTION

3.1 SELECTION OF RACEWAYS

A. Unless more stringent requirements are specified in Contract Documents or manufacturers' written instructions, comply with NFPA 70 for selection of raceways. Consult Architect for resolution of conflicting requirements.

B. Outdoors:

1. Exposed Conduit: ERMC PVC-80.
2. Direct-Buried Conduit: PVC-80.
3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.

C. Indoors:

1. Exposed, Not Subject to Physical Damage: ERMC PVC-805or EMT
2. Concealed in Ceilings and Interior Walls and Partitions: EMT.
3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC FMC.

D. Stub-ups to Above Recessed Ceilings: Provide EMT, IMC, or ERMC for raceways.

E. Raceway Fittings: Select fittings in accordance with NEMA FB 2.10 guidelines.

1. ERMC and IMC: Provide threaded type fittings unless otherwise indicated.

3.2 SELECTION OF BOXES AND ENCLOSURES

A. Unless more stringent requirements are specified in Contract Documents or manufacturers' written instructions, comply with NFPA 70 for selection of boxes and enclosures. Consult Architect for resolution of conflicting requirements.

B. Degree of Protection:

1. Outdoors:
   a. Type 3R unless otherwise indicated.
   b. Locations Exposed to Hosedown: Type 4.
2. Indoors:
   a. Type 1 unless otherwise indicated.
   b. Damp or Dusty Locations: Type 2.
   c. Surface Mounted in Kitchens and Other Locations Exposed to Oil or Coolants: Type 12.
   d. Flush Mounted in Kitchens and Other Locations Exposed to Oil or Coolants: Type 12.
   e. Locations Exposed to Hosedown: Type 4.

C. Exposed Boxes Installed Less Than 6.5 ft. Above Floor:

1. Provide cast-metal boxes.
2. Provide exposed cover. Flat covers with angled mounting slots or knockouts are prohibited.

3.3 INSTALLATION OF RACEWAYS

A. Installation Standards:

1. Unless more stringent requirements are specified in Contract Documents or manufacturers' written instructions, comply with NFPA 70 for installation of raceways. Consult Architect for resolution of conflicting requirements.
2. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
3. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
4. Comply with NECA NEIS 101 for installation of steel raceways.
5. Comply with NECA NEIS 102 for installation of aluminum raceways.
6. Comply with NECA NEIS 111 for installation of nonmetallic raceways.
7. Install raceways square to the enclosure and terminate at enclosures without hubs with locknuts on both sides of enclosure wall. Install locknuts hand tight, plus one-quarter turn more.
8. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4 inch trade size and insulated throat metal bushings on 1-1/2 inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

9. Raceway Terminations at Locations Subject to Moisture or Vibration:
   a. Provide insulating bushings to protect conductors, including conductors smaller than No. 4 AWG. Install insulated throat metal grounding bushings on service conduits.

B. General Requirements for Installation of Raceways:

1. Complete raceway installation before starting conductor installation.
2. Provide stub-ups through floors with coupling threaded inside for plugs, set flush with finished floor. Plug coupling until conduit is extended above floor to final destination or a minimum of 2 ft. above finished floor.
3. Install no more than equivalent of three 90-degree bends in conduit run except for control wiring conduits, for which no more than equivalent of two 90-degree fewer bends are permitted. Support within 12 inch of changes in direction.
4. Make bends in raceway using large-radius preformed ells except for parallel bends. Field bending must be in accordance with NFPA 70 minimum radii requirements. Provide only equipment specifically designed for material and size involved.
5. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
6. Support conduit within 12 inch of enclosures to which attached.
7. Install raceway sealing fittings at accessible locations in accordance with NFPA 70 and fill them with listed sealing compound. For concealed raceways, install fitting in flush steel box with blank cover plate having finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings in accordance with NFPA 70.
8. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal interior of raceways at the following points:
   a. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
   b. Where an underground service raceway enters a building or structure.
   c. Conduit extending from interior to exterior of building.
   d. Conduit extending into pressurized duct and equipment.
   e. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
   f. Where otherwise required by NFPA 70.
9. Do not install raceways or electrical items on "explosion-relief" walls or rotating equipment.
10. Do not install conduits within 2 inch of the bottom side of a metal deck roof.
11. Keep raceways at least 6 inch away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
12. Cut conduit perpendicular to the length. For conduits 2 inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length. Ream inside of conduit to remove burrs.
13. Install pull wires in empty raceways. Provide polypropylene or monofilament plastic line with not less than 200 lb tensile strength. Leave at least 12 inch of slack at both ends of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

C. Requirements for Installation of Specific Raceway Types:

1. Types EMT-A, ERMC-A, and FMC-A:
   a. Do not install aluminum raceways or fittings in contact with concrete or earth.
2. Types ERMC:
   a. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound that maintains electrical conductivity to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
3. Type ERMC-S-PVC:
   a. Follow manufacturer's installation instructions for clamping, cutting, threading, bending, and assembly.
   b. Provide PVC-coated sealing locknut for exposed male threads transitioning into female NPT threads that do not have sealing sleeves, including transitions from PVC couplings/female adapters to Type ERMC-S-PVC elbows in direct-burial applications. PVC-coated sealing locknuts must not be used in place of conduit hub. PVC-coated sealing locknut must cover exposed threads on Type ERMC-S-PVC raceway.
   c. Coat field-cut threads on PVC-coated raceway with manufacturer-approved corrosion-preventing conductive compound prior to assembly.
4. Types FMC and LFMC:
   a. Comply with NEMA RV 3. Provide a maximum of 72 inch of flexible conduit for recessed and semi recessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
5. Type PVC:
   a. Do not install Type PVC conduit where ambient temperature exceeds 122 deg F. Conductor ratings must be limited to 75 deg C except where installed in a trench outside buildings with concrete encasement, where 90 deg C conductors are permitted.
   b. Comply with manufacturer's written instructions for solvent welding and fittings.

D. Raceways Embedded in Slabs:

1. Arrange raceways to cross building expansion joints with expansion fittings at right angles to the joint.
2. Arrange raceways to ensure that each is surrounded by a minimum of 1 inch of concrete without voids.
3. Do not embed threadless fittings in concrete unless locations have been specifically approved by Architect.

E. Stub-ups to Above Recessed Ceilings:

1. Provide EMT, IMC, or ERMC for raceways.
2. Provide a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

F. Raceway Fittings: Install fittings in accordance with NEMA FB 2.10 guidelines.

1. ERMC-S-PVC: Provide only fittings listed for use with this type of conduit. Patch and seal joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Provide sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
2. EMT: Provide set screw or compression , steel fittings. Comply with NEMA FB 2.10.
3. Flexible Conduit: Provide only fittings listed for use with flexible conduit type. Comply with NEMA FB 2.20.

G. Expansion-Joint Fittings:

1. Install in runs of aboveground PVC that are located where environmental temperature change may exceed 30 deg F and that have straight-run length that exceeds 25 ft.. Install in runs of aboveground ERMC conduit that are located where environmental temperature change may exceed 100 deg F and that have straight-run length that exceeds 100 ft..
2. Install type and quantity of fittings that accommodate temperature change listed for the following locations:
   a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
   b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
   c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
   d. Attics: 135 deg F temperature change.
3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
4. Install expansion fittings at locations where conduits cross building or structure expansion joints.
5. Install expansion-joint fitting with position, mounting, and piston setting selected in accordance with manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

H. Raceways Penetrating Rooms or Walls with Acoustical Requirements:

1. Seal raceway openings on both sides of rooms or walls with acoustically rated putty or firestopping.

3.4 INSTALLATION OF SURFACE RACEWAYS

A. Install surface raceways only where indicated on Drawings.

B. Install surface raceway with a minimum 2 inch radius control at bend points.

C. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inch and with no less than two supports per straight raceway section. Support surface raceway in accordance with manufacturer's written instructions. Tape and glue are unacceptable support methods.

3.5 INSTALLATION OF BOXES AND ENCLOSURES

A. Provide boxes in wiring and raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures.

B. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

C. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a rain tight connection between box and cover plate or supported equipment and box, whether installed indoors or outdoors.

D. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

E. Locate boxes so that cover or plate will not span different building finishes.

F. Support boxes in recessed ceilings independent of ceiling tiles and ceiling grid.

G. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for purpose.

H. Fasten junction and pull boxes to, or support from, building structure. Do not support boxes by conduits.

I. Set metal floor boxes level and flush with finished floor surface.

J. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

K. Do not install aluminum boxes, enclosures, or fittings in contact with concrete or earth.

L. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to ensure a continuous ground path.

M. Boxes and Enclosures in Areas or Walls with Acoustical Requirements:

1. Seal openings and knockouts in back and sides of boxes and enclosures with acoustically rated putty.
2. Provide gaskets for wallplates and covers.

3.6 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.7 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

3.8 CLEANING

A. Boxes: Remove construction dust and debris from device boxes, outlet boxes, and floor-mounted enclosures before installing wallplates, covers, and hoods.

END OF SECTION 260533

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Color and legend requirements for raceways, conductors, and warning labels and signs.
2. Labels.
3. Tapes and stencils.
4. Tags.
5. Signs.
6. Cable ties.
7. Paint for identification.
8. Fasteners for labels and signs.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with ASME A13.1 and IEEE C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Comply with NFPA 70E and Section 260573.19 "Arc-Flash Hazard Analysis" requirements for arc-flash warning labels.

F. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg. F., ambient; 180 deg. F., material surfaces .

2.2 COLOR AND LEGEND REQUIREMENTS

A. Raceways and Cables Carrying Circuits at 600 V or Less:

1. Black letters on an orange field.
2. Legend: Indicate voltage and system or service type.

B. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder and branch-circuit conductors.

1. Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.
2. Colors for 208/120-V Circuits:
   a. Phase A: Black.
   b. Phase B: Red.
   c. Phase C: Blue.
3. Colors for 480/277-V Circuits:
   a. Phase A: Brown.
   b. Phase B: Orange.
   c. Phase C: Yellow.
4. Color for Neutral: White.
5. Color for Equipment Grounds: Green.
6. Colors for Isolated Grounds: Green with white stripe.

C. Raceways and Cables Carrying Circuits at More Than 600 V:

1. Black letters on an orange field.
2. Legend: "DANGER - CONCEALED HIGH VOLTAGE WIRING."

D. Warning Label Colors:

1. Identify system voltage with black letters on an orange background.

E. Warning labels and signs shall include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

F. Equipment Identification Labels:

1. Black letters on a white field.

2.3 LABELS

A. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.

2.4 TAPES AND STENCILS

A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.

C. Underground-Line Warning Tape:

1. Tape:
   a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
   b. Printing on tape shall be permanent and shall not be damaged by burial operations.
   c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
2. Color and Printing:
   a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
   b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE”.
   c. Inscriptions for Orange-Colored Tapes: "TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE”.
3. Tag: Type ID :
   a. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core; bright colored, compounded for direct-burial service.
   b. Width: 3 inches.

c. Overall Thickness: 5 mils.
d. Foil Core Thickness: 0.35 mil.
e. Weight: 28 lb/1000 sq. ft..
f. Tensile according to ASTM D 882: 70 lbf and 4600 psi.

2.5 TAGS

A. Nonmetallic Preprinted Tags: Polyethylene tags, 0.023 inch thick, color-coded for phase and voltage level, with factory printed permanent designations; punched for use with self-locking cable tie fastener.

2.6 SIGNS

A. Laminated Acrylic or Melamine Plastic Signs:

1. Engraved legend.
2. Thickness:
   a. For signs up to 20 sq. in., minimum 1/16 inch thick.
   b. For signs larger than 20 sq. in., 1/8 inch thick.
   c. Engraved legend with black letters on white face.
   d. Self-adhesive.
   e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.7 CABLE TIES

A. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg. F. according to ASTM D 638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg. F.
4. Color: Black.

B. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, and self-locking.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg. F. according to ASTM D 638: 7000 psi.
3. UL 94 Flame Rating: 94V-0.
4. Temperature Range: Minus 50 to plus 284 deg. F.
5. Color: Black.

2.8 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 PREPARATION

A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

B. Install identifying devices before installing acoustical ceilings and similar concealment.

C. Verify identity of each item before installing identification products.

D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

E. Apply identification devices to surfaces that require finish after completing finish work.

F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.

G. System Identification for Raceways and Cables under 600 V: Identification shall completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.

1. Secure tight to surface of conductor, cable, or raceway.

H. System Identification for Raceways and Cables over 600 V: Identification shall completely encircle cable or conduit. Place adjacent identification of two-color markings in contact, side by side.

1. Secure tight to surface of conductor, cable, or raceway.

I. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from the floor.

J. Vinyl Wraparound Labels:

1. Secure tight to surface of raceway or cable at a location with high visibility and accessibility.
2. Attach labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.

K. Marker Tapes: Secure tight to surface at a location with high visibility and accessibility.

L. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.

1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.

M. Underground Line Warning Tape:

1. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench exceeds 16 inches overall.
2. Install underground-line warning tape for direct-buried cables and cables in raceways.

N. Nonmetallic Preprinted Tags:

1. Place in a location with high visibility and accessibility.
2. Secure using UV-stabilized plenum-ratedcable ties. based on location

O. Laminated Acrylic or Melamine Plastic Signs:

1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high sign; where two lines of text are required, use labels 2 inches high.

P. Cable Ties: General purpose, for attaching tags, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

3.3 IDENTIFICATION SCHEDULE

A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.

C. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use vinyl wraparound labels self-adhesive vinyl tape to identify the phase.

1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

D. Power-Circuit Conductor Identification, More Than 600 V: For conductors in vaults, pull and junction boxes, manholes, and handholes, use nonmetallic preprinted tags colored and marked to indicate phase, and a separate tag with the circuit designation.

E. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use with the conductor or cable designation, origin, and destination.

F. Control-Circuit Conductor Termination Identification: For identification at terminations, provide with the conductor designation.

G. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive labels Baked-enamel warning signs Metal-backed, butyrate warning signs.

1. Apply to exterior of door, cover, or other access.
2. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:
   a. Power-transfer switches.
   b. Controls with external control power connections.
   c. .

H. Arc Flash Warning Labeling: Self-adhesive labels.

I. Equipment Identification Labels:

1. Indoor Equipment: Laminated acrylic or melamine plastic sign.
2. Outdoor Equipment: Laminated acrylic or melamine sign.
3. Equipment to Be Labeled:
   a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of a self-adhesive, engraved, laminated acrylic or melamine label.
   b. Enclosures and electrical cabinets.

c. Switchboards.
d. Transformers: Label that includes tag designation indicated on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
e. Enclosed switches.
f. Enclosed circuit breakers.
g. Variable-speed controllers.
h. Push-button stations.
i. Battery-inverter units.
j. UPS equipment.

END OF SECTION 260553

SECTION 262213 - LOW-VOLTAGE DISTRIBUTION TRANSFORMERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes distribution, dry-type transformers with a nominal primary and secondary rating of 600 V and less, with capacities up to 1500 kVA.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type and size of transformer.
2. Include rated nameplate data, capacities, weights, dimensions, minimum clearances, installed devices and features, and performance for each type and size of transformer.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by NETA.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inspection: On receipt, inspect for and note any shipping damage to packaging and transformer.

1. If manufacturer packaging is removed for inspection, and transformer will be stored after inspection, re-package transformer using original or new packaging materials that provide protection equivalent to manufacturer's packaging.

B. Storage: Store in a warm, dry, and temperature-stable location in original shipping packaging.

C. Temporary Heating: Apply temporary heat according to manufacturer's written instructions within the enclosure of each ventilated-type unit, throughout periods during which equipment is not energized and when transformer is not in a space that is continuously under normal control of temperature and humidity.

D. Handling: Follow manufacturer's instructions for lifting and transporting transformers.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain each transformer type from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

2.3 GENERAL TRANSFORMER REQUIREMENTS

A. Description: Factory-assembled and -tested, air-cooled units for 60-Hz service.

B. Comply with NFPA 70.

1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

C. Transformers Rated 15 kVA and Larger:

1. Comply with 10 CFR 431 (DOE 2016) efficiency levels.
2. Marked as compliant with DOE 2016 efficiency levels by an NRTL.

D. Shipping Restraints: Paint or otherwise color-code bolts, wedges, blocks, and other restraints that are to be removed after installation and before energizing. Use fluorescent colors that are easily identifiable inside the transformer enclosure.

2.4 DISTRIBUTION TRANSFORMERS

A. Comply with NFPA 70, and list and label as complying with UL 1561.

B. Cores: Electrical grade, non-aging silicon steel with high permeability and low hysteresis losses.

1. One leg per phase.
2. Grounded to enclosure.

C. Coils: Continuous windings without splices except for taps.

1. Coil Material: Copper.
2. Internal Coil Connections: Brazed or pressure type.
3. Terminal Connections: Bolted.

D. Encapsulation: Transformers smaller than 30 kVA shall have core and coils completely resin encapsulated.

E. Enclosure: Ventilated.

1. NEMA 250, Type 2: Core and coil shall be encapsulated within resin compound using a vacuum-pressure impregnation process to seal out moisture and air.
2. KVA Ratings: Based on convection cooling only and not relying on auxiliary fans.
3. Wiring Compartment: Sized for conduit entry and wiring installation.

F. Insulation Class, 30 kVA and Larger: 220 deg C, UL-component-recognized insulation system with a maximum of 150 deg C rise above 40 deg C ambient temperature.

G. Grounding: Provide ground-bar kit or a ground bar installed on the inside of the transformer enclosure.

2.5 IDENTIFICATION

A. Nameplates: Engraved, laminated-acrylic or melamine plastic signs for each distribution transformer, mounted with corrosion-resistant screws. Nameplates and label products are specified in Section 260553 "Identification for Electrical Systems."

B. Nameplates: Self-adhesive label for each distribution transformer. Self-adhesive labels are specified in Section 260553 "Identification for Electrical Systems."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions for compliance with enclosure- and ambient-temperature requirements for each transformer.

B. Verify that field measurements are as needed to maintain working clearances required by NFPA 70 and manufacturer's written instructions.

C. Examine walls, floors, roofs, and concrete bases for suitable mounting conditions where transformers will be installed.

D. Verify that ground connections are in place and requirements in Section 260526 "Grounding and Bonding for Electrical Systems" have been met. Maximum ground resistance shall be 5 ohms at location of transformer.

E. Environment: Enclosures shall be rated for the environment in which they are located. Covers for NEMA 250, Type 4X enclosures shall not cause accessibility problems.

F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install transformers level and plumb on a concrete base with vibration-dampening supports. Locate transformers away from corners.

B. Construct concrete bases according to Section 033000 "Cast-in-Place Concrete" or Section 033053 "Miscellaneous Cast-in-Place Concrete" and anchor floor-mounted transformers according to manufacturer's written instructions and requirements in Section 260529 "Hangers and Supports for Electrical Systems."

1. Coordinate size and location of concrete bases with actual transformer provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

C. Secure transformer to concrete base according to manufacturer's written instructions.

D. Secure covers to enclosure and tighten all bolts to manufacturer-recommended torques to reduce noise generation.

E. Remove shipping bolts, blocking, and wedges.

3.3 CONNECTIONS

A. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."

B. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

D. Provide flexible connections at all conduit and conductor terminations and supports to eliminate sound and vibration transmission to the building structure.

3.4 ADJUSTING

A. Record transformer secondary voltage at each unit for at least 48 hours of typical occupancy period. Adjust transformer taps to provide optimum voltage conditions at secondary terminals. Optimum is defined as not exceeding nameplate voltage plus 5 percent and not being lower than nameplate voltage minus 3 percent at maximum load conditions. Submit recording and tap settings as test results.

B. Output Settings Report: Prepare a written report recording output voltages and tap settings.

3.5 CLEANING

A. Vacuum dirt and debris; do not use compressed air to assist in cleaning.

END OF SECTION 262213

SECTION 262416 - PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Distribution panelboards.
2. Lighting and appliance branch-circuit panelboards.

1.3 DEFINITIONS

A. ATS: Acceptance testing specification.

B. GFCI: Ground-fault circuit interrupter.

C. GFEP: Ground-fault equipment protection.

D. HID: High-intensity discharge.

E. MCCB: Molded-case circuit breaker.

F. SPD: Surge protective device.

G. VPR: Voltage protection rating.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of panelboard.

1. Include materials, switching and overcurrent protective devices, SPDs, accessories, and components indicated.
2. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: ISO 9001 or 9002 certified.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Remove loose packing and flammable materials from inside panelboards; install temporary electric heating (250 W per panelboard) to prevent condensation.

B. Handle and prepare panelboards for installation according to NECA 407.

1.7 FIELD CONDITIONS

A. Environmental Limitations:

1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
    a. Ambient Temperature: Not exceeding 23 deg F to plus 104 deg F.
    b. Altitude: Not exceeding 6600 feet.

B. Service Conditions: NEMA PB 1, usual service conditions, as follows:

1. Ambient temperatures within limits specified.
2. Altitude not exceeding 6600 feet.

C. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Construction Manager no fewer than days in advance of proposed interruption of electric service.
2. Do not proceed with interruption of electric service without Construction Manager's written permission.
3. Comply with NFPA 70E.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace panelboards that fail in materials or workmanship within specified warranty period.

1. Panelboard Warranty Period: 18 months from date of Substantial Completion.

B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace SPD that fails in materials or workmanship within specified warranty period.

1. SPD Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANELBOARDS AND LOAD CENTERS COMMON REQUIREMENTS

A. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with NEMA PB 1.

D. Comply with NFPA 70.

E. Enclosures: Surface-mounted, dead-front cabinets.

1. Rated for environmental conditions at installed location.
   a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
2. Height: 84 inches maximum.
3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Trims shall cover all live parts and shall have no exposed hardware.
4. Finishes:
   a. Panels and Trim: Steel and galvanized steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
   b. Back Boxes: Same finish as panels and trim.

F. Incoming Mains:

1. Location: Convertible between top and bottom.
2. Main Breaker: Main lug interiors up to 400 amperes shall be field convertible to main breaker.

G. Phase, Neutral, and Ground Buses:

1. Material: Tin-plated aluminum.
   a. Plating shall run entire length of bus.

b. Bus shall be fully rated the entire length.

2. Interiors shall be factory assembled into a unit. Replacing switching and protective devices shall not disturb adjacent units or require removing the main bus connectors.
3. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
4. Isolated Ground Bus: Adequate for branch-circuit isolated ground conductors; insulated from box.
5. Full-Sized Neutral: Equipped with full-capacity bonding strap for service entrance applications. Mount electrically isolated from enclosure. Do not mount neutral bus in gutter.

H. Conductor Connectors: Suitable for use with conductor material and sizes.

1. Material: Tin-plated aluminum.
2. Terminations shall allow use of 75 deg C rated conductors without derating.
3. Size: Lugs suitable for indicated conductor sizes, with additional gutter space, if required, for larger conductors.
4. Main and Neutral Lugs: type, with a lug on the neutral bar for each pole in the panelboard.
5. Ground Lugs and Bus-Configured Terminators: Compression type, with a lug on the bar for each pole in the panelboard.
6. Feed-Through Lugs: Compression type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
7. Subfeed (Double) Lugs: Compression type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.
8. Gutter-Tap Lugs: Compression type suitable for use with conductor material and with matching insulating covers. Locate at same end of bus as incoming lugs or main device.

I. Future Devices: Panelboards or load centers shall have mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.

1. Percentage of Future Space Capacity: 20 percent.

J. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals. Assembly listed by an NRTL for 100 percent interrupting capacity.

1. Panelboards and overcurrent protective devices rated 240 V or less shall have short-circuit ratings as shown on Drawings, but not less than 10,000 A rms symmetrical.
2. Panelboards and overcurrent protective devices rated above 240 V and less than 600 V shall have short-circuit ratings as shown on Drawings, but not less than 14,000 A rms symmetrical.

2.2 PERFORMANCE REQUIREMENTS

2.3 POWER PANELBOARDS

A. Panelboards: NEMA PB 1, distribution type.

B. Doors: Secured with vault-type latch with tumbler lock; keyed alike.

1. For doors more than 36 inches high, provide two latches, keyed alike.

C. Mains: Circuit breaker Lugs only.

D. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller: Plug-in circuit breakers [**Bolt-on circuit breakers**] [**Plug-in circuit breakers where individual positive-locking device requires mechanical release for removal**].

E. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers.

2.4 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.

B. Mains: Circuit breaker or lugs only.

C. Branch Overcurrent Protective Devices: Plug-in circuit breakers, replaceable without disturbing adjacent units.

D. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

E. Doors: Door-in-door construction with concealed hinges; secured with multipoint latch with tumbler lock; keyed alike. Outer door shall permit full access to the panel interior. Inner door shall permit access to breaker operating handles and labeling, but current carrying terminals and bus shall remain concealed.

2.5 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. MCCB: Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers:
   a. Inverse time-current element for low-level overloads.
   b. Instantaneous magnetic trip element for short circuits.
   c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
2. GFCI Circuit Breakers: Single- and double-pole configurations with Class A ground-fault protection (6-mA trip).

3. Arc-Fault Circuit Interrupter Circuit Breakers: Comply with UL 1699; 120/240-V, single-pole configuration.
4. Subfeed Circuit Breakers: Vertically mounted.
5. MCCB Features and Accessories:
    a. Standard frame sizes, trip ratings, and number of poles.
    b. Breaker handle indicates tripped status.
    c. UL listed for reverse connection without restrictive line or load ratings.
    d. Lugs: Compression style, suitable for number, size, trip ratings, and conductor materials.
    e. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.

2.6 IDENTIFICATION

A. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles shall be located on the interior of the panelboard door.

B. Breaker Labels: Faceplate shall list current rating, UL and IEC certification standards, and AIC rating.

C. Circuit Directory: Computer-generated circuit directory mounted inside panelboard door with transparent plastic protective cover.

1. Circuit directory shall identify specific purpose with detail sufficient to distinguish it from all other circuits.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify actual conditions with field measurements prior to ordering panelboards to verify that equipment fits in allocated space in, and comply with, minimum required clearances specified in NFPA 70.

B. Receive, inspect, handle, and store panelboards according to NECA 407.

C. Examine panelboards before installation. Reject panelboards that are damaged, rusted, or have been subjected to water saturation.

D. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Comply with NECA 1.

C. Install panelboards and accessories according to NECA 407.

D. Equipment Mounting:

1. Attach panelboard to the vertical finished or structural surface behind the panelboard.

E. Mount top of trim 90 inches above finished floor unless otherwise indicated.

F. Mount panelboard cabinet plumb and rigid without distortion of box.

G. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.

H. Mount surface-mounted panelboards to steel slotted supports 1 1/4 inch in depth. Orient steel slotted supports vertically.

I. Install overcurrent protective devices and controllers not already factory installed.

1. Set field-adjustable, circuit-breaker trip ranges.
2. Tighten bolted connections and circuit breaker connections using calibrated torque wrench or torque screwdriver per manufacturer's written instructions.

J. Make grounding connections and bond neutral for services and separately derived systems to ground. Make connections to grounding electrodes, separate grounds for isolated ground bars, and connections to separate ground bars.

K. Install filler plates in unused spaces.

L. Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.

M. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing.

N. Mount spare fuse cabinet in accessible location.

3.3 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems."

B. Create a directory to indicate installed circuit loads after balancing panelboard loads; incorporate Owner's final room designations. Obtain approval before installing. Handwritten directories are not acceptable. Install directory inside panelboard door.

C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

D. Device Nameplates: Label each branch circuit device in power panelboards with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

E. Install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems" identifying source of remote circuit.

3.4 PROTECTION

A. Temporary Heating: Prior to energizing panelboards, apply temporary heat to maintain temperature according to manufacturer's written instructions.

END OF SECTION 262416

SECTION 262726 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Standard-grade receptacles, 125 V, 20 A.
2. USB receptacles.
3. GFCI receptacles, 125 V, 20 A.
4. Toggle switches, 120/277 V, 20 A.
5. Occupancy sensors.
6. Wall-box dimmers.
7. Floor service fittings.
8. Poke-through assemblies.

1.3 DEFINITIONS

A. AFCI: Arc-fault circuit interrupter.

B. BAS: Building automation system.

C. EMI: Electromagnetic interference.

D. GFCI: Ground-fault circuit interrupter.

E. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

F. RFI: Radio-frequency interference.

G. SPD: Surge protective device.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Comply with NFPA 70.

C. RoHS compliant.

D. Comply with NEMA WD 1.

E. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:

1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
2. Devices shall comply with requirements in this Section.

F. Devices for Owner-Furnished Equipment:

1. Receptacles: Match plug configurations.
2. Cord and Plug Sets: Match equipment requirements.

G. Device Color:

1. Wiring Devices Connected to Normal Power System: White unless otherwise indicated or required by NFPA 70 or device listing.
2. Wiring Devices Connected to Essential Electrical System: Red.
3. SPD Devices: Blue.
4. Isolated-Ground Receptacles: Orange.

H. Wall Plate Color: For plastic covers, match device color.

I. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 STANDARD-GRADE RECEPTACLES, 125 V, 20 A

A. Duplex Receptacles, 125 V, 20 A :

1. Description: Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498 and FS W-C-596.

B. Isolated-Ground Duplex Receptacles, 125 V, 20 A :

1. Description: Straight blade; equipment grounding contacts shall be connected only to green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts. Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498 and FS W-C-596.

C. Tamper- and Weather-Resistant Duplex Receptacles, 125 V, 20 A :

1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498.
4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

2.3 USB RECEPTACLES

A. USB Charging Receptacles :

1. Description: Single-piece, rivetless, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap.
2. USB Receptacles: Dual, USB Type A, 5 V dc, and 2.1 A per receptacle (minimum).
3. Standards: Comply with UL 1310 and USB 3.0 devices.

2.4 GFCI RECEPTACLES, 125 V, 20 A

A. Duplex GFCI Receptacles, 125 V, 20 A :

1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Type: Feed through.
4. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.

B. Tamper- and Weather-Resistant, GFCI Duplex Receptacles, 125 V, 20 A :

1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-15R.
3. Type: Feed through.
4. Standards: Comply with UL 498 and UL 943 Class A.
5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

2.5 TOGGLE SWITCHES, 120/277 V, 20 A

A. Single-Pole Switches, 120/277 V, 20 A :

1. Standards: Comply with UL 20 and FS W-S-896.

B. Three-Way Switches, 120/277 V, 20 A :

1. Comply with UL 20 and FS W-S-896.

2.6 OCCUPANCY SENSORS

A. Vacancy Wall Switch Sensor Light Switch, Dual Technology :

1. Description: Switchbox-mounted, combination lighting-control sensor and conventional switch lighting-control unit using dual (ultrasonic and passive infrared) technology.
2. Standards: Comply with UL 20.
3. Rated 960 W at 120 V ac for tungsten lighting, 10 A at 120 V ac or 10 A at 277 V ac for fluorescent or LED lighting, and 1/4 hp at 120 V ac.
4. Adjustable time delay of five 10 15 20 minutes.
5. Able to be locked to Manual-On mode.

B. Dimmer Wall Sensor Light Switch, Passive Infrared :

1. 0-10V Dimming LED Vacancy Switch. Model as described on drawings.
2. Description: Switchbox-mounted, combination, lighting-control sensor and conventional switch lighting-control unit using passive infrared technology.
3. Standards: Comply with UL 20.
4. Connections: Provisions for connection to BAS.
5. Connections: Hard wired.
6. Connections: Wireless.
7. Rated 960 W at 120 V ac for tungsten lighting, 10 A at 120 V ac or 10 A at 277 V ac for fluorescent or LED lighting, and 1/4 hp at 120 V ac.
8. Integral relay for connection to BAS.
9. Adjustable time delay of five 10 15 20 minutes.
10. Able to be locked to Manual-On mode.

2.7 DIMMERS

A. Wall-Box Dimmers:

1. 0-10V LED Dimmer switches. Model as identified on the project drawings.
2. Control: Continuously adjustable slider; with single-pole or three-way switching.
3. Standards: Comply with UL 1472.

2.8 FLOOR SERVICE FITTINGS

A. Flush-Type Floor Service Fittings:

1. Description: Type: Modular, flush-type, dual-service units suitable for wiring method used, with cover flush with finished floor.
2. Compartments: Barrier separates power from voice and data communication cabling.
3. Service Plate and Cover: Rectangular, with satin finish.
4. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.
5. Data Communication Outlet: Two modular, keyed, color-coded, RJ-45 jacks for twisted pair cable, complying with requirements in Section 271513 "Communications Copper Horizontal Cabling."

2.9 POKE-THROUGH ASSEMBLIES

A. Description: Factory-fabricated and -wired assembly of below-floor junction box with multichanneled, through-floor raceway/firestop unit and detachable matching floor service-outlet assembly.

B. Standards: Comply with scrub water exclusion requirements in UL 514.

C. Service-Outlet Assembly: flush type with two simplex receptacles and space for six RJ 45 jacks complying with requirements in Section 271513 "Communications Copper Horizontal Cabling."

D. Size: Selected to fit nominal 3-inch 4-inch cored holes in floor and matched to floor thickness.

E. Fire Rating: Unit is listed and labeled for fire rating of floor-ceiling assembly.

F. Closure Plug: Arranged to close unused 3-inch 4-inch cored openings and reestablish fire rating of floor.

G. Wiring Raceways and Compartments: For a minimum of four No. 12 AWG conductors and a minimum of six, four-pair cables that comply with requirements in Section 271513 "Communications Copper Horizontal Cabling."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:

1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes, and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall comply with NFPA 70, Article 300, without pigtails.
4. Existing Conductors:
    a. Cut back and pigtail, or replace all damaged conductors.
    b. Straighten conductors that remain and remove corrosion and foreign matter.
    c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up , and on horizontally mounted receptacles to the right .

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:

1. Install dimmers within terms of their listing.
2. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device, listing conditions in the written instructions.

H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 GFCI RECEPTACLES

A. Install non-feed-through GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

A. Comply with Section 260553 "Identification for Electrical Systems."

B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black -filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.4 FIELD QUALITY CONTROL

A. Tests for Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.
6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault-current path, defective devices,

or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

B. Wiring device will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION 262726

SECTION 262813 - FUSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Cartridge fuses rated 600 V ac and less for use in the following:
   a. Enclosed switches.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for spare-fuse cabinets. Include the following for each fuse type indicated:

1. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
2. Fuse sizes for elevator feeders and elevator disconnect switches.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Bussmann, an Eaton business.
2. Littelfuse, Inc.

B. Source Limitations: Obtain fuses, for use within a specific product or circuit, from single source from single manufacturer.

2.2 CARTRIDGE FUSES

A. Characteristics: NEMA FU 1, current-limiting, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.

1. Type RK-1: 600-V, zero- to 600-A rating, 200 kAIC , time delay.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with NEMA FU 1 for cartridge fuses.

D. Comply with NFPA 70.

E. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.

B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.

C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FUSE APPLICATIONS

A. Cartridge Fuses:

1. Motor Branch Circuits: Class RK1 , time delay.
2. Provide open-fuse indicator fuses or fuse covers with open fuse indication.

3.3 INSTALLATION

A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

3.4 IDENTIFICATION

A. Install labels complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems" and indicating fuse replacement information inside of door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION 262813

SECTION 262816 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

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 SUMMARY

A. Section Includes:

1. Fusible switches.
2. Nonfusible switches.
3. Molded-case circuit breakers (MCCBs).

1.3 DEFINITIONS

A. NC: Normally closed.

B. NO: Normally open.

C. SPDT: Single pole, double throw.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

1. Enclosure types and details for types other than NEMA 250, Type 1.
2. Current and voltage ratings.
3. Short-circuit current ratings (interrupting and withstand, as appropriate).
4. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:

1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.

2. Altitude: Not exceeding 6600 feet.

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

2.2 GENERAL REQUIREMENTS

A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.

C. Comply with NFPA 70.

2.3 FUSIBLE SWITCHES

A. Type HD, Heavy Duty:

1. Single throw.
2. Three pole.
3. 600-V ac.
4. 200 A and smaller.
5. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses.
6. Lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

B. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Lugs: type, suitable for number, size, and conductor material.

2.4 NONFUSIBLE SWITCHES

A. Type HD, Heavy Duty, Three Pole, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

B. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Lugs: Mechanical Compression type, suitable for number, size, and conductor material.

2.5 MOLDED-CASE CIRCUIT BREAKERS

A. Circuit breakers shall be constructed using glass-reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.

B. Circuit breakers shall have a toggle operating mechanism with common tripping of all poles, which provides quick-make, quick-break contact action. The circuit-breaker handle shall be over center, be trip free, and reside in a tripped position between on and off to provide local trip indication. Circuit-breaker escutcheon shall be clearly marked on and off in addition to providing international I/O markings. Equip circuit breaker with a push-to-trip button, located on the face of the circuit breaker to mechanically operate the circuit-breaker tripping mechanism for maintenance and testing purposes.

C. The maximum ampere rating and UL, IEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings shall be clearly marked on face of circuit breaker. Circuit breakers shall be 100 percent rated. Fuse/circuit breaker

D. MCCBs shall be equipped with a device for locking in the isolated position.

E. Lugs shall be suitable for 167 deg F rated wire.

F. Standard: Comply with UL 489 with interrupting capacity to comply with available fault currents.

G. Thermal-Magnetic Circuit Breakers: Inverse time-current thermal element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

H. Features and Accessories:

1. Standard frame sizes, trip ratings, and number of poles.
2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Commencement of work shall indicate Installer's acceptance of the areas and conditions as satisfactory.

3.2 PREPARATION

A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Construction Manager no fewer than seven days in advance of proposed interruption of electric service.
2. Indicate method of providing temporary electric service.
3. Do not proceed with interruption of electric service without Construction Manager's written permission.
4. Comply with NFPA 70E.

3.3 INSTALLATION

A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

C. Comply with mounting and anchoring requirements specified in Section 260548.16 "Seismic Controls for Electrical Systems."

D. Temporary Lifting Provisions: Remove temporary lifting of eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

E. Install fuses in fusible devices.

F. Comply with NFPA 70 and NECA 1.

3.4 IDENTIFICATION

A. Comply with requirements in Section 260553 "Identification for Electrical Systems."

1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.5 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION 262816

SECTION 310000 - EARTHWORK

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Cast-In-Place Concrete: Section 033000.

B. Site Restoration: Section 310101.

C. Site Clearing: Section 311000.

D. Rock Removal Section 312316.

D. Erosion and Sediment Control: Section 312513

1.02 DEFINITIONS

A. The following terms shall have the meanings ascribed to them in this Article, wherever they appear in this Section.
1. Earth Excavation: The removal of all surface and subsurface material not classified as rock (as defined below).
2. Rock: Limestone, sandstone, shale, granite, and similar material in solid beds or masses in its original or stratified position which can be removed only by blasting operations, drilling, wedging, or use of pneumatic tools, and boulders with a volume greater than 1.0 cu yd. Concrete building foundations and concrete slabs, not indicated, with a volume greater than 1.0 cu yd shall be classified as rock.

a. Limestone, sandstone, shale, granite, and similar material in a broken or weathered condition which can be removed with an excavator or backhoe equipped with a bucket with ripping teeth or any other style bucket shall be classified as earth excavation.
b. Masonry building foundations, whether indicated or not, shall be classified as earth excavation.

3. Subgrade Surface: Surface upon which subbase or topsoil is placed.
4. Subbase: Subbase course Type 2 which is placed immediately beneath pavement or concrete slabs.
5. Pipe Bedding: Run of bank sand or mixture of crushed stone and gravel to negate the risk of vertical deflection and deformed piping.
6. Trench Backfill: Run of bank sand or mixture of crushed stone and gravel to ensure proper compaction of pipe trenching.
7. Foundation Bearing Grade: Grade/elevation at which the bottom-of-footings are constructed.
8. Maximum Density: The dry unit weight in pounds per cubic foot of the soil at “Optimum Moisture Content” when determined by ASTM D 1557 (Modified Proctor).

9. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
10. Landscaped Areas: Areas not covered by structures, walks, roads, paving, or parking.
11. Unauthorized Excavation: The removal of material below required elevation indicated on the Drawings or beyond lateral dimensions indicated or specified without specific written direction by the Director's Representative.
12. Contract Limit Line: Limits of grading, excavations and filling required for the work of this contract. Unless specifically noted otherwise, the Contract Limit Line and Grading Limit Line shall be considered the same.

1.03 SUBMITTALS

A. Product Data:
1. Filter Fabric: Manufacturer's catalog sheets, specifications, and installation instructions.

B. Quality Control Submittals:
1. Excavation Procedure: Submit a lay out drawing or detailed outline of intended excavation procedure for the Director's information. This submittal will not relieve the Contractor of responsibility for the successful performance of intended excavation methods.
2. Subbase Materials: Name and location of source and the DOT Source Number. If the material is not being taken from an approved DOT Source the results of the gradation and soundness tests performed by an ASTM certified soils laboratory will be required.

a. Classification according to ASTM D2487.
b. Laboratory compaction curve according to ASTM D1557.

3. Other Aggregates: Name and location of source and soil laboratory test results.

1.04 PROJECT CONDITIONS

A. Protect existing trees and plants during performance of the Work unless otherwise indicated. Box trees and plants indicated to remain within the grading limit line with temporary steel fencing or solidly constructed wood barricades as required. Protect root systems from smothering. Do not store excavated material, or allow vehicular traffic or parking within the branch drip line. Restrict foot traffic to prevent excessive compaction of soil over root systems.

B. Cold Weather Requirements:
1. Excavation: When freezing temperatures are anticipated, do not excavate to final required elevations for concrete work unless concrete can be placed immediately.

2. Backfilling: If backfill is being placed during freezing temperatures the backfilling operations shall be monitored by the Director's Representative and the following procedures shall be followed:
   a. Frozen ground shall be removed in its entirety from beneath and five feet beyond the area of fill placement.
   b. The fill material placed shall consist of Selected Fill and shall be free of all frozen chunks that exceed four inches in size. The material transported to the project site shall only consist of material excavated from below the frost depth.
   c. At the end of the work day, the area of fill placement shall be covered with insulated blankets, or left unprotected. Other means of protection (hay, wood chips, etc.) may also be used for protection provided it is approved by the Director's Representative.
   d. Following work day, remove the insulated blankets and/or strip the area of all frozen material as specified previously.
   e. Upon establishing the subgrade elevations, protect the grades with insulated blankets or place additional material that will adequately insulate the exposed earth surface from frost. This additional fill or protective material shall be stripped just prior to pouring concrete.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Subbase Course Type 2 and Structural Fill: Stockpiled, crushed ledge rock or approved blast furnace slag. Comply with the gradation and material requirements specified below:

Sieve		**Percent Passing**
Sieve Size	**Size opening (mm)**	
2 inch	50.8	100
1/4 inch	6.35	25-60
No. 40	0.425	5-40
No. 200	0.075	0-10

1. Magnesium Sulfate Soundness Test: 20 percent maximum loss by weight after four test cycles.
2. Plasticity Index: The plasticity index of the material passing the No. 40 mesh sieve shall not exceed 5.0.
3. Elongated Particles: Not more than 30 percent, by weight, of the particles retained on a 1/2 inch sieve shall consist of flat or elongated particles. A flat or elongated particle is defined as one which has its greatest dimension more than three times its least dimension.

B. Pipe Bedding: Shall consist of clean, hard, durable, uncoated particles, free from lumps of clay and all deleterious substances and shall meet the following gradation requirements:

Sieve Size		Percent Passing
Sieve Size	Size opening (mm)	
3/4 inch	19.05	100
No. 40	0.425	0-70
No. 200	0.075	0-10

C. Trench Backfill: Sound, durable, sand, gravel, stone, or blends of these materials, free from organic and other deleterious materials. Comply with the gradation requirements specified below:

Sieve		Percent Passing
Sieve Size	Size opening (mm)	
4 inch	101.6	100
No. 40	0.425	0-70
No. 200	0.075	0-15

D. Suitable Material (Fill and Backfill for Landscaped Areas): Material consisting of mineral soil (inorganic), blasted or broken rock and similar materials of natural or man-made origin, including mixtures thereof. Maximum particle size shall not exceed 2/3 of the specified layer thickness prior to compaction. NOTE: Material containing cinders, industrial waste, sludge, building rubble, land fill, muck, and peat shall be considered unsuitable for fill and backfill, except topsoil and organic silt may be used as suitable material in landscaped areas provided it is placed in the top layer of the subgrade surface.

E. Unsuitable Material: Material containing organic material (wood, roots, stumps, decaying material, etc) and/or resulting from the clearing, grubbing, and removal of existing improvements.

F. Marker Tape: FL Industries Blackburn/Holub's Type YT6, or Seton Nameplate Corporations Type 6 ELE, imprinted with message suited to item buried below.

2.02 GEOTECHNICAL FABRICS

A. Filter Fabric (Geotextile)

1. Drainage: Amoco 1199 & 2019, Maccaferri MacTex MX140 & MX155, Mirafi 140N & 160N, Fiberweave 403 & 404, or approved equivalent.
2. Silt Fence: Stabilinka T140N, Filter X, Mirafi 100X, or approved equivalent.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protection

1. Prevent damage to buildings, pavement, pipes, conduits, poles and other structures above and below ground that are adjoining or included in the contract area. Repair damage resulting from the contractor's negligence.
2. Protect existing trees and shrubs not to be removed. Cut back to point of branching all broken branches and skinned areas. Treat exposed wood with tree pruning compound.
3. Store materials and equipment in cleared areas away from tree roots. Prevent employees and equipment from trampling over woodland, existing planting, and established lawns.

3.02 TREE REMOVAL AND RECYCLING

A. It is the Director's intent that trees to be removed as part of this project be felled by Park's staff prior to the start of Work. Coordinate tree cutting/felling with Director's Representative.
B. It is the Director's intent that trees to be removed as part of this project be recycled in one of the following ways:
   1. Sold to a mill for lumber production
   2. Sold to a mill for paper product production
   3. Harvested for fire wood production
   4. Other Director's Representative approved option
C. Prior to removal, provide Director's Representative with written certification from receiving facilities where timber is to be recycled. Certification shall identify proposed product use. Receiving facilities shall provide copies of material receipts and quantities to the Director's Representative.

3.03 CLEARING AND GRUBBING

A. Clear and grub the site within the Grading Limit Line (GLL) of trees, shrubs, brush, other prominent vegetation, debris, and obstructions except for those items indicated to remain. Completely remove stumps and remove roots within 18 inches of the surface.

B. Fill depressions caused by clearing and grubbing operations in accordance with the requirements for filling and backfilling, unless further excavation is indicated.

3.04 UNDERGROUND UTILITIES

A. Locate existing underground utilities prior to commencing excavation work. Determine exact utility locations by hand excavated test pits. Support and protect utilities to remain in place.

B. Do not interrupt existing utilities that are in service until temporary or new utilities are installed and operational.

C. Utilities to remain in service: Shall be re-routed as shown on the Contract Drawings.

D. Utilities abandoned beneath and five feet laterally beyond proposed site features shall be removed in their entirety. Excavations required for their removal shall be backfilled and compacted as specified herein.

E. Utilities located outside the limits specified above may be abandoned in place provided their ends are adequately plugged as described below.
   1. Permanently close open ends of abandoned underground utilities exposed by excavations, which extend outside the limits of the area to be excavated.
   2. Close open ends of metallic conduit and pipe with threaded galvanized metal caps or plastic plugs or other approved method for the type of material and size of pipe. Do not use wood plugs.
   3. Close open ends of concrete and masonry utilities with concrete or flow-able fill.

3.05 EXCAVATION

A. Excavate earth as required for the Work.

B. Install and maintain all erosion and sedimentation controls during all earthwork operations as specified on the Contract Drawings or as directed by local officials. If the erosion and sedimentation controls specified by the local officials are more stringent than those specified on the Contract Drawings contact the Director's Representative.

C. Maintain sides and slopes of excavations in a safe condition until completion of backfilling. Comply with Code of Federal Regulations Title 29 - Labor, Part 1926 (OSHA).
   1. Trenches: Deposit excavated material on one side of trench only. Trim banks of excavated material to prevent cave-ins and prevent material from falling or sliding into trench. Keep a clear footway between excavated material and trench edge. Maintain areas to allow free drainage of surface water.

D. Stockpile excavated materials classified as suitable material where directed, until required for fill. Place, grade, and shape stockpiles for proper drainage as approved by the Director's Representative.

E. Excavation for Structures: Conform to elevations, lines, and limits indicated. Excavate to a vertical tolerance of plus or minus 1 inch. Extend excavation a sufficient lateral distance to provide clearance to execute the Work.

F. Conduit, Cable, Tubing and Piping (other than Bell and Spigot): Provide sufficient trench width for installation and to accommodate special backfill when specified.

G. Unauthorized Excavations: Unless otherwise directed, backfill unauthorized excavation under footings, foundation bases, and retaining walls with compacted select granular material without altering the required footing elevation. Elsewhere, backfill and compact unauthorized excavation as specified for authorized excavation of the same classification, unless otherwise directed by the Director's Representative.

1. Unauthorized excavations under structural Work such as footings, foundation bases, and retaining walls shall be reported immediately to the Director's Representative before any concrete or backfilling Work commences.

H. Notify the Director's Representative upon completion of excavation operations. Do not proceed with the Work until the excavation is inspected and approved. Inspection of the excavation by the Director's Representative will be made on 3 working days notice.

3.06 DEWATERING

A. Prevent surface and subsurface water from flowing into excavations and trenches and from flooding the site and surrounding area.

B. Do not allow water to accumulate in excavations or trenches. Remove water from all excavations immediately to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to the stability of subgrades and foundations. Furnish and maintain pumps, sumps, suction and discharge piping systems, and other system components necessary to convey the water away from the Site.

C. Convey water removed from excavations, and rain water, to collection or run-off area. Cut and maintain temporary drainage ditches and provide other necessary diversions outside excavation limits for each structure. Do not use trench excavations as temporary drainage ditches.

D. Provide temporary controls to restrict the velocity of discharged water as necessary to prevent erosion and siltation of receiving areas.

3.07 PLACING FILTER FABRIC

A. Place and overlap filter fabric in accordance with the manufacturer's installation instructions, unless otherwise shown.

B. Cover tears and other damaged areas with an additional filter fabric layer extending 3 feet beyond the damage.

C. Do not permit traffic or construction equipment directly on filter fabric.

D. Backfill over filter fabric within two weeks after placement. Backfill in accordance with the fabric manufacturer's instructions and in a manner to prevent damage to the fabric.

3.08 PLACING FILL AND BACKFILL

A. Surface Preparation of Fill Areas: Strip topsoil, remaining vegetation, and other deleterious materials prior to placement of fill. Remove all asphalt pavement in its entirety from areas requiring the placement of fill or break up old pavement(s) to a maximum size of four inches. Prior to placement of fill, smooth out and compact areas where wheel rutting has occurred due to stripping or earthwork operations.

B. Excavations: Backfill as promptly as practicable, but only after approval by the Director's Representative. Do not backfill with excavated material unless it meets the requirements of this Section.

C. Place backfill and fill materials in layers not more than 8 inches thick in loose depth unless otherwise specified. Before compaction, moisten or aerate each layer as necessary to facilitate compaction to the required density. Do not place backfill or fill material on surfaces that are muddy, frozen, or covered with ice.
   1. Place fill and backfill against foundation walls, and in confined areas (such as trenches) not easily accessible by larger compaction equipment, in maximum six inch thick (loose depth) layers.
   2. For Open Graded Stone/Clean Stone (Item B-12, No. 1 crushed stone, No. 2 crushed stone, etc.) in excess of six inches: Material must be wrapped in separation fabric.

D. Prevent wedging action of backfill against structures by placing backfill uniformly around structure to approximately same elevation in each layer. Place backfill against walls of structures containing basements or crawl spaces only after the first floor structural members are in place.

E. Landscaped Areas: Place suitable material when required to complete fill or backfill areas up to subgrade surface elevation. Do not use material containing rocks over four inches in diameter within the top 12 inches of suitable material.

3.09 COMPACTION

A. All materials with exception of open graded stone (No. 2 Crushed Stone, Pipe Bedding, Trench Backfill etc.):
   1. Compact each layer of fill and backfill for the following area classifications to the percentage of maximum density specified below and at a moisture content suitable to obtain the required densities, but at not less than three percent drier or more than two percent wetter than the optimum content as determined by ASTM 1557 (Modified Proctor).

      a. Foundation Bearing: 95 percent.
      b. Pipes: 95 percent.
      c. Pipe Bedding: 95 percent.
      d. Landscaped Areas: 90 percent.

B. If a compacted layer fails to meet the specified percentage of maximum density, the layer will be re-compacted and retested. If compaction cannot be achieved the material/layer will be removed and replaced. No additional material may be placed over a compacted layer until the specified density is achieved

C. Open graded Stone (Item B-12, No. 1 crushed stone, etc): material in maximum twelve inch lifts. Each lift shall be raked smooth and compacted through several passes of a walk behind vibratory roller. Compaction Testing is **not** required.

3.10 GRADING

A. Rough Grading: Trim and grade area within the Grading Limit Line and excavations outside the limit line, required by this Contract, to a level of four inches below the finish grades indicated unless otherwise specified herein or where greater depths are indicated. Provide smooth uniform transition to adjacent areas.

B. Finish Grading: Finish surfaces free from irregular surface changes, and as follows:
1. Grassed Areas: Finish areas to receive topsoil to within 1 inch above or below the required subgrade surface elevations.
2. Pavements: Place and compact subbase material as specified. Shape surface of areas to required line, grade and cross section, with the finish surface not more than 1/2 inch above or below the required subbase elevation.

3.11 RESTORATION

A. Restore pavements, walks, curbs, lawns, and other exterior surfaces damaged during performance of the Work to match the appearance and performance of existing corresponding surfaces as closely as practicable.

3.12 DISPOSAL OF EXCESS AND UNSUITABLE MATERIALS

A. Remove from State property and dispose of excess and unsuitable materials, including materials resulting from clearing and grubbing and removal of existing improvements.

B. Transport excess and unsuitable materials, including materials resulting from clearing and grubbing and removal of existing improvements, to spoil areas on State property designated by the Director’s Representative, and dispose of such materials as directed.

3.13 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material classification and maximum lift thickness comply with requirements.
3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements. Notify the Director's Representative at least three (3) working days prior to all phases of filling and backfilling operations.

D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

E. Testing agency will test compaction of soils in place according to ASTM D1556, ASTM D2167, ASTM D2937, and ASTM D6938, as applicable. Tests will be performed at the following locations and frequencies:

1. Foundation Backfill: At each compacted backfill layer, at least one test for every 4 footings but no fewer than two tests per day of work.
2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length but no fewer than two tests.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.14 CLEAN UP

A. Remove and dispose of all logs, tree trimmings, and debris from property. Leave Work area in a neat, uncluttered condition.

END OF SECTION 310000

SECTION 310101 - SITE RESTORATION

PART 1 - GENERAL

1.01 QUALITY ASSURANCE

A. Provide prepackaged seed readily available to the public with quality and purity equal to product of O.M. Scotts and Son, Marysville, OH 43041. On-the-job or made-to-order mixes will not be accepted.

1.02 DELIVERY STORAGE AND HANDLING

A. Deliver fertilizer in manufacturer's standard size bags or cartons showing weight, analysis, and the name of the manufacturer. Store as approved by Director's Representative.

B. Store all seed at the site in a cool dry place as approved by the Director's Representative. Replace any seed damaged during storage.

1.03 SCHEDULING

A. Time For Seeding: Sow grass seed between April 1 and May 15th or between August 15th and October 15th, except as otherwise approved in writing by the Director.

PART 2 - PRODUCTS

2.01 TOPSOIL

A. Provide topsoil conforming to the following:
1. Original loam topsoil, well drained homogeneous texture and of uniform grade, without the admixture of subsoil material and entirely free of dense material, hardpan, sod, or any other objectionable foreign material.
2. Containing not less than 4 percent nor more than 20 percent organic matter in that portion of a sample passing a 1/4 inch sieve when determined by the wet combustion method on a sample dried at 105 degrees C.
3. Containing a Ph value within the range of 4.5 to 7 on that portion of the sample that passes a 1/4 inch sieve.
4. Containing the following gradations:

SIEVE DESIGNATION	PERCENT PASSING
1 inch	100
1/4 inch	97 - 100
No. 200	20 - 65 (of the 1/4 inch sieve)

2.02 FERTILIZER

A. Fertilizer: Mixed commercial fertilizers shall contain total nitrogen, available phosphoric acid and soluble potash in the ratio of 10-6-4 (50% N/UF). 50% of total nitrogen shall be derived from ureaform furnishing a minimum of 3.5% water insoluble nitrogen (3.5% WIN). The balance of the nitrogen shall be present as methylene urea, water-soluble urea, nitrate and ammoniacal compounds.

B. Other fertilizers meeting DOT Specification Section 713-03 Fertilizer can be used.

2.03 SEED

A. Furnish fresh, clean, new-crop seed mixed in the proportions specified for species and variety, and conforming to Federal and State Standards.

B. Acceptable material in a seed mixture other than pure live seed consists of nonviable seed, chaff, hulls, live seed of crop plants and inert matter. The percentage of weed seed shall not exceed 0.1 percent by weight.

C. All seed will be rejected if the label indicates any noxious weed seeds.

D. Provide seed mixture equal to Scotts Pure Premium Sun and Shade North Grass Seed Mixture, comprised of the following:

SEED MIXTURE			
AMOUNT BY WEIGHT IN MIXTURE	**SPECIES OR VARIETY ***	**PERCENTAGE**	
		PURITY	**GERMINATION**
20 PERCENT	ABBEY KENTUCKY BLUEGRASS BLEND	95 PERCENT	80 PERCENT
80 PERCENT	PERENNIAL RYE	98 PERCENT	85 PERCENT
100 PERCENT			

*Variety may be altered depending on availability of seed from manufacturer.

2.04 MULCH

A. Dry Application, Straw: Stalks of oats, wheat, rye or other approved crops that are free of noxious weed seeds. Weight shall be based on a 15 percent moisture content.

PART 3 - EXECUTION

3.01 GRADING

A. Rough Grading: Trim and grade lawn areas within the Contract Limit to a level of 4 inches below the finish grades indicated unless otherwise specified herein or

where greater depths are indicated. Provide smooth uniform transition to adjacent areas.

B. Finish Grading: Finish surfaces free from irregular surface changes, and as follows:
   1. Grassed Areas: Finish areas to receive topsoil to within 1 inch above or below the required subgrade surface elevations.

3.02 SPREADING TOPSOIL

A. Perform topsoil spreading operations only during dry weather.

B. To ensure a proper bond with topsoil, harrow or otherwise loosen the subgrade to a depth of 3 inches before spreading topsoil.

C. Spread topsoil directly upon prepared subgrade to a minimum depth measuring 4 inches after natural settlement in areas to be seeded. Smooth out unsightly variations, bumps, ridges, and depressions that will hold water. Remove stones, litter, or other objectionable material. Finished surfaces shall conform to the contour lines and elevations indicated on the drawings or fixed by the Director's Representative.

3.03 PREPARATION FOR SEEDING

A. Seed Bed: Scarify soil to a depth of 2 inches in compacted areas. Smooth out unsightly variations, bumps, ridges, and depressions that will hold water. Remove stones, litter, or other objectionable material.

3.04 FERTILIZING

A. Apply 10-6-4 fertilizer evenly at the rate of 40 pounds per 1000 sq ft .

3.05 SEEDING

A. Assume all risks when seed is sowed before approval of seed analysis.

B. Do not seed when the wind velocity exceeds 5 miles per hour.

C. Application Rate: 8 pounds per 1000 sq ft.

D. Dry Application: Sow seed evenly by hand or seed spreader on dry or moderately dry soil.

3.06 MULCHING

A. Dry Application: Within 3 days after seeding, cover the seeded areas with a uniform blanket of straw mulch at the rate of 50 pounds per 1000 sq ft of seeded area.

3.07 LAWN ESTABLISHMENT

A. Maintain the grass at heights between 2-1/2 inches and 3-1/2 inches and include a minimum of 2 mowings.

B. Water and protect all seeded areas until final acceptance of the lawn.

3.08 FINAL ACCEPTANCE

A. Final acceptance of seeded areas will be granted when a uniform stand of acceptable grass is obtained, with a minimum of 95 percent coverage. Portions of the seeded areas may be accepted at various times at the discretion of the Director's Representative.

B. Unacceptable seeded areas, dry application: Reseed as specified and fertilized at one-half the specified rate.

C. Once accepted, the State will assume all maintenance responsibilities.

END OF SECTION 310101

SECTION 312513 - EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Earthwork: Section 310000.

B. Topsoil: Section 329120.

C. Seeding: Section 329219.

1.02 REFERENCES

A. Erosion and Sediment Control Guidelines: Conform to the latest edition of “NEW YORK STANDARDS and SPECIFICATIONS for EROSION and SEDIMENT CONTROL” by NYS Department of Environmental Conservation DOW (i.e., Bluebook).

B. Stormwater Management: Conform to the latest edition of “NEW YORK STATE STORMWATER MANAGEMENT DESIGN MANUAL” prepared by Center for Watershed Protection for NYS Department of Environmental Conservation.

1.03 RESPONSIBILITY

A. During construction conduct operations in such a manner as to prevent or reduce to a minimum any damage to any water body from pollution by debris, sediment, chemical or other foreign material, or from the manipulation of equipment and/or materials in or near a stream or ditch flowing directly to a stream. Any water which has been used for wash purposes or other similar operations which become polluted with sewage, silt, cement, concentrated chlorine, oil, fuels, lubricants, bitumens, or other impurities shall not be discharged into any water body.

B. In the event of conflict between these specifications and the regulation of other Federal, State, or local jurisdictions, the more restrictive regulations shall apply.

1.04 DESCRIPTION

A. The Work shall consist of furnishing, installing, inspecting, maintaining, and removing soil and erosion control measures as shown on the Contract Documents or as ordered by the Director’s Representative during the life of the contract to provide erosion and sediment control.

B. Temporary structural measures provide erosion control protection to a critical area for an interim period. A critical area is any disturbed, denuded slope subject to erosion. These are used during construction to prevent off-site sedimentation. Temporary structural measures shall include stabilized construction entrance,

dust control, silt fence, storm drain inlet protection, or other erosion control devices or methods as required.

C. Vegetative measures shall include mulching, protecting vegetation, seeding, and topsoil.

D. Inspections will be completed by the Director's Representative. Comply with and correct all deficiencies found as a result of these inspections. At the end of the construction season when soil disturbance activities will be finalized or suspended until the following spring, the frequency of the inspections may be reduced. If soil disturbance is completely suspended and the site is properly stabilized, a minimum of monthly inspections must be maintained. The stabilization activities must be completed before snow cover or frozen ground. If vegetation is required, seeding, planting and/or sodding must be scheduled to avoid die-off from fall frosts and allow for proper germination/establishment.

1.05 DEFINITIONS – TEMPORARY STRUCTURAL MEASURES

A. Stabilized Construction Entrance: A stabilized pad of aggregate underlain with geotextile where traffic enters a construction site to reduce or eliminate tracking of sediment to public roads.

B. Dust Control: Prevent surface and air movement of dust from disturbed soil surfaces.

C. Silt Fence: A barrier of geo-textile fabric installed on contours across the slope to intercept runoff by reducing velocity.

D. Storm Drain Inlet Protection: A semi-permeable barrier installed around storm inlets to prevent sediment from entering a storm drainage system.

1.06 DEFINITIONS – VEGETATIVE MATERIALS MEASURES

A. Mulches: Hay, straw, wood cellulose, fiber mats, flexible growth medium and other materials approved by the Director's Representative.

B. Protecting Vegetation: Protecting trees, shrubs, ground cover and other vegetation from damage.

C. Temporary Seeding: Erosion control protection to a critical area for an interim period. A critical area is any disturbed, denuded slope subject to erosion.

D. Permanent Seeding: Grasses established and combined with shrubs to provide perennial vegetative cover on disturbed, denuded, slopes subject to erosion.

E. Topsoil: Placed before permanent seeding is installed.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Filter Fabric: See Section 310000 – Earthwork.

B. Seeding: Permanent, see Section 329219.

C. Silt Fence: See Section 310000 - Earthwork

2.02 COMPANIES-TEMPORARY STRUCTURAL

A. Mirafi, 365 South Holland Drive, Pendergrass, Ga, 30567, (888) 795-0808, www.mirafi.com.

B. North American Green, 14649 Highway 41 North, Evansville, IN 47725, (800) 772-2040, www.nagreen.com.

C. Siltdam Inc., P.O. Box 960, Brockton MA, 02303, (800) 699-2374, www.spilldam.com.

D. Nedia Enterprises, Inc., 22187 Vantage Pointe Place, Ashburn, VA 20148, (888) 725-6999, www.nedia.com.

E. Belton Industries, 5600 Oakbrook Parkway, Norcross GA., 30093, (800) 225-4099, www.beltonindustries.com.

F. KriStar, 1219 Briggs Ave., Santa Rosa, CA 95401, (800) 579-8819, www.kristar.com.

G. Rolanka International Inc., 155 Andrew Drive, Stockbridge GA 30281, (800) 760-3215, www.rolanka.com.

H. Apex Resources Inc., 12910 Shelbyville Road, Louisville, KY 40243 (888) 677-2739, www.apexr.com.

I. MonoSol, LLC, 707 E. 80th PL., Merrillville, IN 46410 (800) 237-9552, www.terraloc.com.

J. Brockton Equipment Inc., P.O. Box 960, Brockton, MA 02303 (800) 699-2374, www.spilldam.com.

K. Aer-Flo Inc., 4455 18th St. East, Bradenton, FL 34203 (800) 823-7356, www.aerflo.com.

L. Contech Construction Products Inc., 9025 Centre Point Drive, Suite 400, West Chester, Ohio 45069, (800) 338-1122, www.contech-cpi.com.

2.03 COMPANIES-VEGETATIVE

A. Nedia Enterprises, Inc., 22187 Vantage Pointe Place, Ashburn, VA 20148, (888) 725-6999, www.nedia.com.

D. Agrecol Corporation, 2918 Agriculture Drive, Madison, Wi, 53718, (608) 226-2544, www.agrecol.com.

PART 3 - EXECUTION

3.01 WORK AREAS

A. The Director's Representative has the authority to limit the surface area of erodible earth exposed by earthwork operations and to direct the Contractor to provide immediate temporary or permanent erosion measures to minimize damage to property and contamination of watercourses and water impoundments. Under no circumstances will the area of erodible earth material exposed at one time exceed 43,560 sq. ft. The Director's Representative may increase or decrease this area of erodible earth material exposed at one time as determined by his analysis of project, weather and other conditions. The Director's Representative may limit the area of clearing and grubbing and earthwork operations in progress commensurate with the Contractor's demonstrated capability in protecting erodible earth surfaces with temporary, permanent, vegetative or biotechnical erosion control measures.

B. Schedule the work so as to minimize the time that earth areas will be exposed to erosive conditions. Provide temporary structural measures immediately to prevent any soil erosion.

C. Provide temporary seeding on disturbed earth or soil stockpiles exposed for more than 7 days or for any temporary shutdown of construction in accordance with Section 329219-Seeding.

D. Coordinate the use of permanent controls or finish materials shown with the temporary erosion measures.

E. All erosion and sediment control devices must be maintained in working order until the site is stabilized. All preventative and remedial maintenance work, including clean out, repair, replacement, re-grading, re-seeding, or re-mulching, must be performed immediately.

F. After final stabilization has been achieved temporary sediment and erosion controls must be removed. Areas disturbed during removal must be stabilized immediately.

END OF SECTION 312513

SECTION 321216 – ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Earthwork: Section 310000.

B. Concrete Paving: Section 321313.

1.2 SUMMARY

A. Section Includes:
1. Hot-mix asphalt paving.
2. Hot-mix asphalt patching.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Asphalt Design Mixes: For each type of asphalt pavement.

C. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by NYS DOT.

B. Testing Agency Qualifications: Qualified in accordance with ASTM D3666 for testing indicated.

1.5 PROJECT CONDITONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
1. Prime Coat: Minimum surface temperature of 60 deg F.
2. Tack Coat: Minimum surface temperature of 60 deg F.
3. Asphalt Binder Course: Minimum surface temperature of 40 deg F and rising at time of placement.
4. Asphalt Top Course: Minimum surface temperature of 60 deg F at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: ASTM D692, sound; angular crushed stone or crushed gravel.

C. Fine Aggregate: ASTM D1073 or AASHTO M 29, sharp-edged natural sand or sand prepared from stone, gravel, or combinations thereof.

2.2 ASPHALT MATERIALS

A. Hot Mix Asphalt (HMA): Dense, hot laid asphalt plant mixes produced at a NYSDOT approved facility, designed in accordance with NYSDOT Material Methods (MM), and complying with NYSDOT standard specifications for Hot Mix Asphalt (HMA). The following mixes are utilized for this project:
1. Top Course: NYSDOT, 12.5mm F2 HMA, 80 series compaction.
2. Binder Course: NYSDOT, 19mm F9 HMA, 80 series compaction.
3. Asphalt Cement Tack Coat: Material shall conform to NYSDOT Section 407 – Tack Coat.
4. Prime Coat: Cut-back asphalt type, ASTM D 2027; MC-30, MC-70 or MC-250.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protection: Provide protective materials, procedures, and worker training to prevent asphalt materials from spilling, coating, or building up on curbs, driveway aprons, manholes, and other surfaces adjacent to the Work.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
2. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

3.3 PATCHING

A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Tack Coat: Before placing patch material, apply tack coat uniformly to vertical asphalt surfaces abutting the patch. Apply at a rate of 0.05 to 0.15 gal./sq. yd.

C. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.

D. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

E. Placing Two-Course Patch Material: Partially fill excavated pavements with hot-mix asphalt binder course mix and, while still hot, compact. Cover asphalt binder course with compacted layer of hot-mix asphalt top course, finished flush with adjacent surfaces.

3.4 REPAIRS

A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.
   1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.

B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch.
   1. Clean cracks and joints in existing hot-mix asphalt pavement.
   2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.
   3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.

3.5 TACK COAT

A. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd.
   1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
   2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.6 HOT-MIX ASPHALT PLACEMENT

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
   1. Place hot-mix asphalt binder course in number of lifts and thicknesses indicated.
   2. Place hot-mix asphalt surface course in single lift.
   3. Spread mix at a minimum temperature of 250 deg F.
   4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
   5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.
   1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Overlap mix placement about 1 to 1-1/2 inches from strip to strip to ensure proper compaction of mix along longitudinal joints.
   2. Complete a section of asphalt binder course before placing asphalt surface course.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.7 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
   1. Clean contact surfaces and apply tack coat to joints.
   2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
   3. Offset transverse joints, in successive courses, a minimum of 24 inches.
   4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method in accordance with AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."
   5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
   6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.8 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
   1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
   1. Average Density, Rice Test Method: 92 percent of reference maximum theoretical density in accordance with ASTM D2041, but not less than 90 percent or greater than 96 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.9 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce thickness indicated within the following tolerances:
   1. Base Course and Binder Course: Plus or minus 1/2 inch.
   2. Surface Course: Plus 1/4 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
   1. Base Course and Binder Course: 1/4 inch.
   2. Surface Course: 1/8 inch.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined in accordance with ASTM D3549.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

D. In-Place Density: Testing agency shall take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.
   1. Reference maximum theoretical density shall be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
   2. In-place density of compacted pavement shall be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.
      a. One core sample shall be taken for every 1000 sq. yd or less of installed pavement, with no fewer than three cores taken.
      b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

E. Replace and compact hot-mix asphalt where core tests were taken.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

END OF SECTION 321216

SECTION 323123 - VINYL FENCING AND GATES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Privacy Fence

B. Post Caps

C. Gates

D. Gate Hardware

1.2 RELATED SECTIONS

A. Section 03 3000 - Cast-in-Place Concrete.

1.3 REFERENCES

A. ASTM D 1784 - Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.

1.4 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

B. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

C. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic cleaning and maintenance of all components.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm engaged in the manufacture of vinyl fence and gates of types and sizes specified, and whose products have been in satisfactory use in similar service for a minimum of five years.

B. Installer Qualifications: A firm with a minimum of two years of successful installation experience with projects utilizing vinyl fence and gates similar in type and scope to that required for this Project.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the Project site in manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, and lot number, if any.

B. Store materials in their original, undamaged packages and containers, inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.7 WARRANTY

A. Lifetime Limited, Non-Prorated Warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Key-Link Fencing & Railing and Superior Plastic Products, which is located at: 260 Jalyn Dr.; New Holland, PA 17557; Toll Free Tel: 800-633-7093; Fax: 717-355-7129; Email:request info (jsurovi@superiorplastic.net); Web:https://superiorplasticproducts.com|http://KeyLinkOnline.com

B. Substitutions: As approved by Architect.

C. Requests for substitutions will be considered in accordance with provisions of Section 01 6000 - Product Requirements.

2.2 MATERIALS

A. PVC: Poly Vinyl Chloride (PVC) formulated to resist impact and for Ultra Violet (UV) stabilization. Extruded products meets or exceeds ASTM D I784.

2.3 PRIVACY FENCE

A. Style: Cambridge Privacy Fence
   1. Height:
      a. 72 inch
   2. Section Width:
      a. 8 foot
   3. Cambridge Classic:
      a. Top and Bottom Horizontal Rails: 1-3/4 inch by 7 inch
      b. Vertical Panels: 3/4 inch by 10 inch interlocking.
   4. Posts: 5 inch by 5 inch.
   5. Gates and Posts:
      a. Matching fence style.
   6. Colors:
      a. White

2.4 POST CAPS

A. Vinyl Post Cap
   1. Size:
      a. 5 inch Flat (White)

2.5 GATE HARDWARE

A. "Select" Gate Hardware:
   1. Latch: Stainless steel with aluminum latch clapper
   2. Aluminum Handle
   3. Hinge Set - Select
   4. Drop Pin Kit - Select
   5. 2 Way Latch Set
   6. Finish/Color: Powder coated
      a. White

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until conditions have been properly prepared.

B. Verification of Conditions: Examine locations where fencing is to be installed for any conditions detrimental to the proper and timely completion of the work.

C. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare the grade and remove surface irregularities, if any, which may cause interference with the installation of the fence.

C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Set posts and gate posts for gate openings as indicated on the Drawings.

C. Center and align posts, place concrete around posts and vibrate or tamp for consolidation. Recheck vertical and top alignment of posts, and make necessary corrections.

D. Install gates plumb, level, and secure for full opening without interference. For double gates, install drop rod. Adjust hardware for smooth operation.

3.4 CLEANING

A. Touch-up, repair, or replace damaged products before Substantial Completion.

B. Clean the work according to manufacturer's written instructions. Post hole excavations shall be scattered uniformly away from the posts. Clean fence with mild household detergent and rinse well with clean water. Remove mortar from exposed

posts using a 10 percent solution of muriatic acid followed immediately by several rinses with clean water.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 329120 - TOPSOIL

PART 1 - GENERAL

1.01 SUBMITTALS

A. Samples:
1. Topsoil for Testing: In the presence of the Director's Representative, take a 5 lb sample from each 100 cu yds of topsoil from the topsoil source, to be used on the project.

B. Material Test Reports: For imported or manufactured topsoil.

1.02 QUALITY ASSURANCE

A. Topsoil used on this project shall be tested, and approved before placement.

B. Soil Testing Laboratory Qualifications: An independent or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt and clay content; deleterious material; pH; and mineral and plant-nutrient content of the soil.

1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
2. Report suitability of tested soil for plant growth.
   a. Based upon the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sf or volume per cu. yd. for nitrogen, phosphorous, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants and grasses.

D. Secure approval before stripping topsoil from a borrow area or delivering topsoil to the project site.

PART 2 - PRODUCTS

2.01 TOPSOIL

A. Source: Provide topsoil from areas from which no topsoil has been taken previously and from areas which are producing, or have produced fair to good yield farm crops without unusual fertilization for a minimum period of 10 years, or from arable or cultivable areas supplied with good normal drainage.

B. Provide topsoil conforming to the following:
1. Original loam topsoil, well drained homogeneous texture and of uniform grade, without the admixture of subsoil material and entirely free of dense material, hardpan, sod, or any other objectionable foreign material.
2. Containing not less than 5 percent nor more than 20 percent organic matter in that portion of a sample passing a 1/4 inch sieve when determined by the wet combustion method on a sample dried at 105 degrees C.
3. Containing a Ph value within the range of 6.5 to 7.5 on that portion of the sample which passes a 1/4 inch sieve.
4. Containing the following gradations:

SIEVE DESIGNATION	PERCENT PASSING
1 inch	100
1/4 inch	97 - 100
No. 200	20 - 60 (of the 1/4 inch sieve)

2.02 LIMESTONE

A. Provide ground limestone in the producer's standard bags containing not less than 90 percent of calcium and magnesium carbonates equivalent to not less than 45 percent of the mixed oxides of calcium and magnesium and conforming to the following gradations:

SIEVE DESIGNATION	PERCENT PASSING
No. 100	50 - 100
No. 20	100

PART 3 - EXECUTION

3.01 PREPARATION

A. Grub out and remove all vegetation in the area of the approved topsoil source.

3.02 SPREADING TOPSOIL

A. Perform topsoil spreading operations only during dry weather.

B. To ensure a proper bond with the topsoil, harrow or otherwise loosen the subgrade to a depth of 3 inches before spreading topsoil.

C. Spread topsoil directly upon prepared subgrade to a minimum depth measuring 4 inches after natural settlement in areas to be seeded. In sodded areas the thickness of the topsoil after natural settlement plus the sod shall equal 4 inches. Smooth out unsightly variations, bumps, ridges, and depressions which will hold

water. Remove stones, litter, or other objectionable material. Finished surfaces shall conform to the contour lines and elevations indicated on the drawings or fixed by the Director's Representative.

3.03 SPREADING LIMESTONE

A. Spread ground limestone evenly over the topsoiled surface. Incorporate limestone within the top 2 inches of soil prior to finish raking.

B. Apply limestone at the following rate per 1000 sq ft of topsoil area, corresponding to the hydrogen ion concentration (Ph) shown by the soil chemical analysis:

PH	RATE (pounds)
6.5 to 6.8	25
over 6.8	0

END OF SECTION 329120

SECTION 329219 - SEEDING

PART 1 - GENERAL

1.01 SUBMITTALS

A. Product Data; Hydro Mulch: Manufacturer's specifications and application rate.

B. Sample: One pound of seed in vendor's unopened package with label and seed analysis.

1.02 QUALITY ASSURANCE

A. Provide prepackaged seed readily available to the public with quality and purity equal to product of O.M. Scotts and Son, Marysville, OH. On-the-job or made-to-order mixes will not be accepted.

1.03 DELIVERY STORAGE AND HANDLING

A. Deliver fertilizer in manufacturer's standard size bags or cartons showing weight, analysis, and the name of the manufacturer. Store as approved by Director's Representative.

B. Deliver seeds, 30 days in advance of anticipated use, in vendor's unopened packages bearing labels showing vendor's name and seed analysis by weight.

1.04 SCHEDULING

A. Time For Seeding: Sow grass seed between April 1st and May 15th or between August 1st and October 1st, except as otherwise approved in writing by the Director's Representative.

PART 2 - PRODUCTS

2.01 FERTILIZER

A. Fertilizer: Mixed commercial fertilizers shall contain total nitrogen, available phosphoric acid and soluble potash in the ratio of 10-6-4 (50% N/UF). 50% of total nitrogen shall be derived from ureaform furnishing a minimum of 3.5% water insoluble nitrogen (3.5% WIN). The balance of the nitrogen shall be present as methylene urea, water soluble urea, nitrate and ammoniacal compounds.

B. Other fertilizers meeting DOT Specification Section 713-03 Fertilizer can be used.

2.02 SEED

A. Furnish fresh, clean, new-crop seed mixed in the proportions specified for species and variety, and conforming to Federal and State Standards.

B. Acceptable material in a seed mixture other than pure live seed consists of nonviable seed, chaff, hulls, live seed of crop plants and inert matter. The percentage of weed seed shall not exceed 0.1 percent by weight.

C. All seed will be rejected if the label or test analysis indicates any of the following contaminates: Timothy, Orchard Grass, Sheep Fescue, Meadow Fescue, Canada Blue Grass, Alta Fescue, Kentucky 31 Fescue, and Bent Grass.

D. For all permanent lawn/seeded areas, provide the following seed mixture:

A = Min. Percentage of Germination
B = Min. Purity Percentage
C = Weight Pure Live Seed in Mixture

Name	Variety	A	B	C
Chewings Fescue (Festuca rubra commutata)	Banner, Highlight, Jamestown, or an approved equal.	85	97	25
Kentucky Bluegrass * (Poa pratensis)	Barron, Flyking, Glade, or an approved equal.	80	95	55
Perennial Ryegrass ** (Lolium perenne)	Manhatten II, Pennfine, Yorktown II, or an approved equal.	90	98	20

*Approximately equal proportions of 2 or more improved Bluegrass varieties as listed in the Cornell Recommendations for Turfgrass.

**One or more of the improved Ryegrass varieties as listed in the Cornell Recommendations for Turfgrass.

2.03 MULCH

A. Dry Application, Straw: Stalks of oats, wheat, rye or other approved crops which are free of noxious weeds. Weight shall be based on a15 percent moisture content.

B. Hydro Application: Colored wood cellulose fiber product specifically designed for use as a hydro-mechanical applied mulch. Acceptable Product: Conwed Hydro Mulch, Conwed Fibers, 231 4th Street SW, Hickory, NC.

PART 3 - EXECUTION

3.01 GRADING

A. Rough Grading: Trim and grade lawn areas within the Contract Limit to a level of 4 inches below the finish grades indicated unless otherwise specified herein or where greater depths are indicated. Provide smooth uniform transition to adjacent areas.

B. Finish Grading: Finish surfaces free from irregular surface changes, and as follows:
   1. Grassed Areas: Finish areas to receive topsoil to within 1 inch above or below the required subgrade surface elevations.

3.02 PREPARATION FOR SEEDING

A. Seed Bed: Scarify soil to a depth of 3 inches in compacted areas. Smooth out unsightly variations, bumps, ridges, and depressions which will hold water. Remove stones, litter, or other objectionable material.
   1. Obtain written approval of seed bed from the Director's Representative before commencing seeding operations.

3.03 FERTILIZING

A. Apply 5-10-5 (NPK) fertilizer evenly at the rate of 4 pounds per 1000 sq ft .

3.04 SEEDING

A. Assume all risks when seed is sowed before approval of seed analysis.

B. Do not seed when the wind velocity exceeds 5 miles per hour.

C. Application Rate for permanently seeded areas:
   1. 5 pounds per 1,000 sq. ft.

D. Dry Application: Sow seed evenly by hand or seed spreader on dry or moderately dry soil.

E. Hydroseeding:
   1. Apply seeding materials with an approved hydroseeder.
   2. Fill tank with water and agitate while adding seeding materials. Use sufficient fertilizer, mulch, and seed to obtain the specified application rate. Add seed to the tank after the fertilizer and mulch have been added. Maintain constant agitation to keep contents in homogeneous suspension. Prolonged delays in application or agitation that may be injurious to the seed will be the basis of rejection of material remaining in tank.
   3. Distribute uniformly a slurry mixture of water, seed, fertilizer, and mulch at a minimum rate of 57 gallons per 1000 sq ft (2500 gallons per acre). The

Director's Representative may order the amount of water increased if distribution of seeding materials is not uniform.

F. Temporary Seeding: Provide temporary seeding on disturbed earth or soil stockpiles exposed for more than 7 days or for any temporary shutdown of construction. In spring, summer or early fall apply rye grass at a rate of 1 lb/ 1000 sq.ft. In late fall or early spring, apply certified Aroostook Rye at a rate of 2.5 lbs./ 1000 sq. ft. Apply hay or straw at a rate of 2 bales/ 1000 sq. ft. or wood fiber hydromulch at the manufacturer's recommended rate. Hay or straw shall be anchored. Temporarily seeded areas, provide the following seed mixture:

A = Min. Percentage of Germination
B = Min. Purity Percentage
C = Weight Pure Live Seed in Mixture

Name	Variety	A	B	C
Perennial Ryegrass ** (Lolium multiflorum)	Manhatten II, Pennfine, Yorktown II, or an approved equal.	90	98	100

3.05 MULCHING

A. Dry Application: Within one day after seeding, cover the seeded areas with a uniform blanket of straw mulch at the rate of 100 pounds per 1000 sq ft of seeded area.

B. Hydro Application: Apply approved mulch in accordance with the manufacturer's written instructions and recommended rates of application.

3.06 LAWN ESTABLISHMENT

A. Maintain the grass at heights between 2-1/2 inches and 3-1/2 inches on a weekly basis until the physical completion of the Work.

B. Water and protect all seeded areas until final acceptance of the lawn.

3.07 FINAL ACCEPTANCE

A. Final acceptance of lawn or native grass areas will be granted when a uniform stand of acceptable grass is obtained, with a minimum of 95 percent coverage. Portions of the lawn or native grass areas may be accepted at various times at the discretion of the Director's Representative.

B. Unacceptable lawn, dry application: Reseed as specified and fertilized at one-half the specified rate.

C. Unacceptable lawn, hydro application: Reseed, fertilize, and mulch at one-half the specified rate, use full water rate.

D. At the physical completion of the Work, the State will assume maintenance responsibilities of the lawn areas.

END OF SECTION 329219