Project Manual

Volume 1 of 2

Orange-Ulster BOCES

53 Gibson Road, Goshen, NY 10924



ADDITIONS & ALTERATIONS AT THE

EMANUEL AXELROD SPECIAL EDUCATION CENTER 103 GIBSON ROAD, GOSHEN, NY 10924

25 OCTOBER 2024 BID ISSUE

SED Control Number 44-90-00-00-0-009-036 OUBOCES Bid Number RFP-OUB-CP04-2024

ARCHITECT KG+D Architects

285 Main Street, Mount Kisco, NY 10549 914.666.5900 <u>www.kgdarchitects.com</u>

MEP ENGINEER GERARD ASSOCIATES CONSULTING ENGINEERS D.P.C.

223 Main Street, Goshen, NY 10924

845.291.1272

STRUCTURAL & MHE ENGINEERING

CIVIL ENGINEER 33 Airport Center Drive, New Windsor, NY 12553

845.567.3100

ABATEMENT DESIGNER QUALITY ENVIRONMENTAL SOLUTIONS & TECHNOLOGY, INC.

1376 Route 9

Wappingers Falls, NY 12590

845.298.6031

ROOFING CONSULTANT WATSKY ASSOCIATES

20 Madison Ave. Valhalla, NY 10595

914.948.3450

SPECIFICATIONS KALIN ASSOCIATES INC.

P.O Box 420 Natick, MA 01760

617.964.5477

THE UNDERSIGNED CERTIFIES THAT TO THE BEST OF HIS KNOWLEDGE, INFORMATION AND BELIEF, THE PLANS AND SPECIFICATIONS ARE IN ACCORDANCE WITH APPLICABLE REQUIREMENTS OF THE NEW YORK STATE UNIFORM FIRE PREVENTION AND BUILDING CODE, THE STATE ENERGY CONSERVATION CONSTRUCTION CODE, AND BUILDING STANDARDS OF THE EDUCATION DEPARTMENT, AND THAT THE PLANS AND SPECIFICATIONS REQUIRE THAT NO ASBESTOS CONTAINING MATERIAL SHALL BE USED.

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25 October 2024 44-90-00-00-0-009-036 Bid Issue Orange-Ulster BOCES Emanuel Axelrod Special Education Center Additions & Alterations

SECTION TITLE

334100 POLYETHYLENE DRAINAGE PIPE

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ADVERTISEMENT FOR BIDS

Orange-Ulster BOCES will receive individual sealed proposals before <u>5 December 2024 @ 2PM</u> for:

Emanuel Axelrod Special Education Center
Additions and Alterations
53 GIBSON ROAD
GOSHEN, NEW YORK 10924
SED # 44-90-00-00-0-009-036
OUBOCES Project # RFB-OUB-CP04-2024

ORANGE ULSTER BOCES 53 GIBSON ROAD GOSHEN, NEW YORK 10924

The Owner will receive the proposals at the Business / Administration Office, 53 Gibson Road Goshen, New York 10924, and at that time all proposals that have been received in accordance with the terms hereof will be publicly opened and read aloud.

The Owner invites bidders to bid on the work described in the Bid Documents that falls within the following bid package:

Contract No.	<u>Trade</u>
1	General Construction
2	Hazardous Materials Abatement
3	Roofing
4	Plumbing
5	Mechanical
6	Electrical

See the Bid Documents for a further description of the scope of work.

Bidders must use the Bid Proposal Forms included with the Bid Documents in order to make their proposals, and each proposal must be made in accordance with those Forms.

The contract awarded pursuant to this bid will require the contractor to enter into the Project Labor Agreement included in the Bid Documents.

Bidders may obtain the Bid Documents on **October 29, 2024.** Complete digital sets of Bidding Documents may be obtained online as a download at the following website: revplans.biddyhq.com. Follow instructions to create an account or login if already registered. Select the "Projects" tab at the top of the screen and use the search function if needed to view this project. All bidders are urged to register to ensure receipt of all necessary information, including Bid Addenda.

Bidding Documents including Drawings, Specifications and Addenda, may be examined without charge by accessing RevPlans' online plan room at revplans.biddyhq.com. (RevPlans, 28 Church Street, Unit 7, Warwick, NY, 10990, 845.651.3845). It is free to register, browse and preview documents on the plan room. Bidders are required to register to ensure receipt of all necessary information, including Bid Addenda. The fee to download digital files is \$100.00. Click the Purchase button on the project's page to choose Digital Only, Hard Copy Only or Both.

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Additions & Alterations

The cost associated with each will be displayed. Costs for documents and shipping/handling are non-refundable.

Please note REVplans (revplans.biddyhq.com) is the designated location and means for distributing all bid package information. REVplans takes no responsibility for the accuracy or completeness of Bidding Documents obtained from other sources. Obtaining Bidding Documents through REVplans enables a prospective bidder to be identified as a registered plan holder. All Bid Addenda issued after initial document download will be transmitted to registered plan holders via email and will be available at revplans.biddyhq.com. Plan holders who have paid for hard copies of the Bidding Documents may coordinate directly with REVplans if hard copies of Bid Addenda are needed. There is no charge for registered plan holders to obtain hard copies of the Bid Addenda.

There will be a pre-bid site meeting on **November 12, 2024 at 3:30 pm** at the Emanuel Axelrod Education Center, 53 Gibson Road, Goshen NY 10924 **Bidders are urged to attend the site meeting. Knowledge of the field conditions is crucial to understanding the Work.**

Each proposal must be accompanied by a certified check payable to Orange-Ulster BOCES or by a Bid Bond for a sum equal to five percent (5%) of the bid, conditioned as set forth in the Instructions to Bidders. All bid security, except those of the three low bidders will be returned within four days after proposals are submitted. The bid security provided by the three low bidders will be returned after the execution of the Trade Contract.

The Owner may require the successful bidder to provide separate Performance and Labor & Materials Payment Bonds in the amount of the contract price and in the form specified in the Bid Documents.

All laborers, workers and mechanics working on the site of this project must be certified as having successfully completed the OSHA 10-hour construction safety and health course.

To the fullest extent allowed by law, the Owner reserves the right to reject bids that contain omissions, exceptions or modifications, or in their sole discretion to waive such irregularities, or to reject any or all bids or to accept any bid which is in the best interest of the District.

All proposals shall be sealed and in an opaque envelope distinctly marked on the outside as follows:

Orange-Ulster BOCES – Emanuel Axelrod Education Center Additions & Alterations OUBOCES Bid Number – RFB-OUB-CP04-2024
Bid Opening Date: December 5, 2024 @ 2PM
Name of Bidder
Contract Number and Trade
Marked "SEALED BID"

Such proposals must be delivered to the Business / Administration Office, 53 Gibson Road Goshen, New York 10924. The Owner will not open or consider any proposal unless it is received at that location by no later than the bid opening date and time. Bidders are solely responsible for the arrival of each bid proposal at the place of bid opening by the appointed time, regardless of the means of delivery.

END OF ADVERTISEMENT

SECTION 002100 - INVITATION AND INSTRUCTIONS TO BIDDERS

1.1 OWNER, PROJECT, ARCHITECT, BID PROCEDURE

- A. The Owner, Orange-Ulster BOCES; invites sealed bids for the Emanuel Axelrod Education Center Additions and Alterations Project and related work all as described in the accompanying contract documents as prepared by KG+D Architects, P.C. 285 Main Street; Mt. Kisco, NY 10549
- B. Bids shall be received in accordance with the New York State Public Bidding Laws, this project will be executed under MULTIPLE PRIME CONTRACTS as enumerated in the Notice To Bidders and as identified noted below:

Contract #1	General Construction
Contract #2	Abatement
Contract #3	Roofing
Contract #4	Plumbing
Contract #5	Mechanical
Contract #6	Electrical

C. The attention of all bidders is directed to the fact that a single set of documents exist for the construction of the Project as a whole. Work on each sheet, or within any technical specification section may or may not have an effect on the work of any single Prime Contractor. Failure on the part of any Prime Contractor to examine all documents will not be cause for additional cost to the Owner.

1.2 DISCREPANCY

- A. Should any bidder find any discrepancies in, or omission from, the Contract Documents, or should the bidder be in doubt as to the meaning of any portion of said documents, they shall at once notify the Architect and obtain an interpretation or clarification prior to submission of their bid.
- B. <u>Any request for interpretation or clarification given in accordance with this provision shall be in writing.</u>
- C. The bidder may, during the bidding period, be advised by addendum of additions, deletions, or alterations in any of the documents forming a part of this Contract. All such additions, deletions or alterations shall be included in the work covered by the bid and shall become a part of this Contract. Upon such mailing or delivery and making available for inspection, such addendum shall become a part of the Contract Documents and shall be binding on all Bidders whether or not the Bidder receives or acknowledges the actual notice of such addendum. The requirements contained in all Contract Documents shall apply to all addenda.

CUTOFF DATE FOR RECEIPT OF REQUESTS FOR INFORMATION (RFI'S) SHALL BE NOVEMBER 26, 2024 AT 12PM

- D. RFIs shall be submitted in writing via email to the Architect, Attn: Brian Mangan bmangan@kgdarchitects.com and Nick Binder nbinder@kgdarchitects.com
- E. Only interpretations, corrections or additional Contract provisions made in writing by the Architect as addenda shall be binding. No officer, agent or employee of the Owner or the Architect is authorized to explain or to interpret the Contract Documents by any

Orange-Ulster BOCES
Emanuel Axelrod Special Education Center
Additions & Alterations

other method and any such explanation or interpretation, if given, shall not be relied upon by the Bidder.

- 1.3 REPRESENTATION Each bidder, by making their bid, represents that -
 - A. They have read and understands the Bidding Documents (consisting of the Project Manual, Drawings and Addenda (if any)) and their Bid is made in accordance therewith.
 - B. The Contractor shall familiarize themselves with the existing conditions, verify necessary field conditions to prepare an accurate proposal, perform all required measurements for the fabrication and installation of work, and assume complete responsibility for the accuracy of same.
 - C. All materials to be incorporated in the work shall be "asbestos free" in their manufacture.

1.4 DOCUMENTS

- A. Bidders may obtain the Bid Documents on **October 29, 2024** from REVPlans, 28 Church Street Unit 7, Warwick New York 10990 Tel: 845-651-3845. Complete digital sets of Bidding Documents, drawings and specifications, may be obtained online as a download at the following website: revplans.biddyhq.com
- B. Bidders are required to register to ensure receipt of all necessary information, including Bid Addenda.
- C. The fee to download digital files is \$100.00. Click the Purchase button on the project's page to choose Digital Only, Hard Copy Only or Both. The cost associated with each will be displayed. Costs for documents and shipping/handling are non-refundable.
- D. Any bidder requiring documents to be shipped shall make arrangements with the printer and pay for all packaging and shipping costs.
- E. Please note RevPlans (<u>revplans.biddyhq.com</u>) is the designated location and means for distributing and obtaining all bid package information. All bidders are urged to register to ensure receipt of all necessary information, including bid addenda.
- 1.5 INFORMATIONAL MEETING All bidders are advised that an informational meeting will be held as follows:
 - A. Date November 12, 2024
 - B. Local Prevailing Time 3:30 pm
 - C. Location: 53 Gibson Road, Goshen NY 10924, meet at the Main Entrance to the Emanuel Axelrod Education Center
 - D. Any and all questions that may arise as a result of this meeting will be recorded and answered by the Addendum process.

NOTE: ALL BIDDERS WILL BE PRESUMED TO HAVE FULL KNOWLEDGE OF THE SITE, AND ALL INFORMATION AVAILABLE AT THE PRE-BID WALK THROUGH. NO EXTRA COST OR TIME EXTENSIONS WILL BE GRANTED BECAUSE OF LACK OF KNOWLEDGE OF ON SITE CONDITIONS, APPARENT, OR DATA AVAILABLE DURING THE WALK THROUGH.

1.6 BIDDING

A. Sealed bids, with the name and address of the Bidder and division of Work contained thereon, will be received at the Administration Office, 53 Gibson Road Goshen, NY 10924 on or before **DECEMBER 5, 2024 AT 2:00 PM**, Local Prevailing Time at which

time all bids will be opened publicly and read aloud.

- B. All bids shall be submitted in duplicate on the Proposal Forms provided within the specifications and shall be submitted in an opaque sealed envelope with the following contained thereon:
 - 1. OUBOCES Bid Number RFP-OUB-CP04-2024
 - 2. Project Name.
 - 3. Contract Number.
 - 4. Type of Construction.
 - 5. Name of Bidder.
 - 6. Mark "SEALED BID".
- C. All spaces on Proposal Form must be completed. All signatures shall be in ink and in longhand.
- D. No oral or telephonic proposals or modifications of proposals will be considered.
- E. Any proposals containing exceptions or modifications may, at the Owner's option, be disqualified.

1.7 QUALIFICATIONS OF BIDDER

- A. The Owner may make such investigation as the Owner deems necessary to determine the responsibility of any Bidder or to determine the ability of any Bidder to perform the Work.
- B. Bidders shall furnish to the Owner all information and data required by the Owner, including complete financial data, within the time and in the form and manner required by the Owner.
- C. The Owner reserves the right to reject any bid if the evidence required by the Owner is not submitted as required or if the evidence submitted by or the investigation of any Bidder fails to satisfy the Owner that the Bidder is responsible or is able or qualified to carry out the obligations of the Contract or to complete the Work as contemplated.

1.8 POST BID PROCEDURES

- A. The responsibility of bidders and of their proposed subcontractors will be considered in making the award. The Owner through the Architect may make such investigation as the Owner deems necessary to determine the responsibility of any bidder or to determine the ability of any bidder to perform the Work.
- B. When requested by the Architect, bidders shall furnish all information and data required by the Owner, including financial data, within the time and in the form and manner required by the Owner. Upon notification from the Architect, the three apparent low bidders shall furnish within three (3) working days after the bid opening four (4) copies of the following information in writing:
 - 1. Signed and notarized bidder qualification statement (see Section 004600);
 - 2. the names, addresses and phone numbers of the subcontractors and suppliers that the bidder proposes to use on the project;
 - 3. the bidder's proposed site safety plan;
 - 4. a bar chart showing the bidders' proposed plan and schedule to complete the bidder's work in accordance with the phasing milestones outlined in Section 011000.
 - 5. the insurance certificates required by the Bid Documents:
 - 6. a proposed schedule of values for the bidder's work;
 - 7. a proposed list of submittals and a proposed schedule for making them, all keyed to the bar chart.
- C. After receipt of the above information, the Construction Manager will designate a time

- and place for a meeting between the Owner, the Construction Manager, the Architect and the apparent low bidder. The apparent low bidder's principal, project manager and site superintendent will attend that meeting, at which time the parties will discuss the bidder's responsiveness, responsibility and qualifications.
- D. The Owner reserves the right to disapprove the use of any proposed Subcontractor and in such event the bidder shall submit the name of another Subcontractor in like manner within the time specified by the Architect.
- E. To the fullest extent allowed by law, the Owner reserves the right to reject any bid if the evidence required by the Owner is not submitted or fails to satisfy the Owner that the bidder is responsible, able and qualified to carry out the obligations of the Contract or to complete the Work as contemplated. The Owner will consider the information received under paragraphs A through D above in determining whether or not to accept a proposal.
- F. Acceptance of a proposal will be a notice in writing signed by a duly authorized representative of the Owner.
- G. Any bidder whose proposal is accepted will be required to sign the Trade Contract within ten (10) days after receiving notice of acceptance.
- H. In the event that the Owner should reject the proposal of a bidder as provided above or otherwise, at the Owner's option, the Owner may elect to meet with the next lowest bidder and to consider the information as provided in paragraphs A through D above. In the event that the proposal of the next lowest bidder is rejected as provided above or otherwise, at the Owner's option, the Owner may elect to meet with the third lowest bidder and repeat the above process. At all times the Owner retains the right to reject all bids.

1.9 APPROVAL OF SUBCONTRACTORS

- A. When requested by the Owner, Bidders shall, within the time specified by the Owner, submit to the Owner the names of the Subcontractors which the Bidder proposes to use on the project.
- B. The Owner reserves the right to disapprove the use of any proposed Subcontractor and in such event the Bidder shall submit the name of another Subcontractor in like manner within the time specified by the Owner.
- C. The Owner reserves the right to reject any bid if the names of proposed Subcontractors are not submitted as required.

1.10 SECURITY AND BONDS (Coordinate with Sections 004500, 006110 and 006120)

- A. Every bid shall be accompanied by a Bid Bond in the amount of 5 percent of the Contract Sum drawn by a recognized surety authorized to conduct business in the State of New York and made payable to the Owner.
 - Bid Security shall be submitted in a separate sealed envelope clearly identifying the company and project as well as the name and address of the Surety Company.
 - 2. Each Bond must be accompanied by a Power of Attorney, giving names of Attorneys-in-fact, and the extent of their bonding authority. All bonds shall be countersigned by a resident Agent and with a Surety Company or Corporation meeting the following qualifications:
 - a. Surety must be licensed to do business in the State of New York.
 - b. Surety shall be listed on the current U.S. Treasury Department Circular 570 entitled "Companies Holding Certificates of Authority" from the Secretary of the Treasury under the Act of Congress

approved July, 30, 1974 (6 U.S.C., Sec. 6-13), as Acceptable Sureties on Federal Bonds.

- c. Surety must meet minimum rating requirements as published in current "Best's Key Rating Guide" as listed below:
 - 1. For contracts not exceeding \$250,000, the following shall apply for all bonding companies holding a certified guarantee agreement form, the Small Business Administration (a copy of said agreement must accompany the bond.)

Contract Amount	Financial Size	Policy Holder
	Category	Rating
\$0- (But not including)	Class VI	В
\$100,000		
\$100,000-(But not	Class X	A-
including) \$250,000		

- 2. On all bonds, the Surety shall be rated as equal to "A-" or better as to "Policy Holder Ratings" and "X" or better as to "Financial Size Category" by "Best's Key Rating Guide."
- 3. Limitations:
 - a. Bonding limits or bonding capacity refers to the limit or amount of bond acceptable on any one project.
 - The bonding limit for each contractor shall not exceed the amount listed on the above referenced U.S. Treasury Department List for the Surety issuing the bond.
- 4. All Surety companies are subject to approval and may be rejected by the Owner without cause, in the same manner that bids may be rejected.
- 5. Compliance: In the event any of the requirements outlined herein are not complied with, the Owner shall have the right to reject the bid or annul the Award of the Contract.
- B. Bid security will be returned to all except the three lowest bidders, after formal analysis and evaluation of bids. No bid will be withheld beyond the forty-five (45) day period stipulated above.
- C. Remaining bid security will be returned to bidders after Owner and successful bidder have executed the Agreement and the Owner has received and approved performance and payment bonds.
- D. If the required agreement has not been executed within the specified period of time after the bid opening, bid security of any bidder will be returned upon his request, provided he has not been notified of acceptance of his bid prior to the date of his request.
- E. Separate Performance and Payment Bonds will be required for the work. Each shall be in the amount of 100% of the Contract price.
- F. The Contractors shall include in their proposal amounts the total premiums for the performance and labor and material payment bonds as set forth in Section 006100.

1.11 TAX STATUS

A. The Owner, Orange-Ulster BOCES, is an educational non-profit institution and is therefore "tax-exempt" in accordance with the applicable laws of the State of New York and with Chapter 32 of the Internal Revenue Code, as most recently amended,

for collection of all sales and excise taxes.

B. Exemption Certificates will be furnished to each Respective Prime Contractor.

1.12 INSURANCE

A. Insurance as required by Article 17 of the Form of Agreement and as set forth in the Insurance Rider (Section 007002) shall be required of each Respective Prime Contractor and shall be of forms and limits required therein.

1.13 EQUIVALENCY CLAUSE (Coordinate with Section 012500)

- A. When in the project manual/specifications, two or more kinds, types, brands, or manufacturers of materials are named they are regarded as establishing the required standard of quality and not for the purpose of limiting competition.
- B. The contractor may select one of these items or, if the contractor desires to use any kind, type, brand, manufacturer or material other than those named in the specification, he shall, in accordance with the instructions set forth in "Post-Bid Requirements" herein, identify within three (3) days after bid submission, but in any event prior to award of contract, what kind, type, brand, or manufacturer is included in the base bid for the specified item following procedures set forth in Section 012500.
- C. Failure to so identify the perceived "equivalencies", will not relieve contractor from providing the specified items.

1.14 AWARD OF CONTRACT

- A. This notice is an offer to receive proposals for a contract and not an offer of a contract.
- B. The award of the Contract shall be made to the Bidder submitting the lowest bid if, in the opinion of the Owner, such Bidder is qualified to perform the Work involved, is responsible and reliable.
- C. Alternates, if stated in the Proposal Form, shall be chosen at the discretion of the Owner when awarding the Contract. The lowest bid will then be determined by adding to, or subtracting from, to the bidder's total base bid, all Alternates chosen by the Owner.
- D. The Bidder agrees to commence work within ten (10) days of receipt of a Notice To Proceed, Letter of Intent, and/or Execution of Contract whichever is earlier.
- E. The Owner reserves the right to reject any bid or all bids, to waive any informalities or irregularities or omissions in any bid received or to afford any Bidder an opportunity to remedy any informality or irregularity if it is in the Owner's interest to do so.
- F. The award of the Contract shall not be construed as a guarantee by the Owner that the plant, equipment and the general scheme of operations of a Bidder is either adequate or suitable for the satisfactory performance of the Work or that other data supplied by a Bidder is accurate.

1.15 EXECUTION OF THE PROJECT LABOR AGREEMENT

As a condition of being awarded a contract or subcontract for work covered by the Contract Documents, the successful Bidder and any subcontractor of any tier on the Orange Ulster BOCES Emanuel Axelrod Education Center Additions and Alterations Project agrees to become signatory to, and to abide by, the provisions of the project labor agreement with the Hudson Valley Building and Construction Trades Council, AFLCIO and the signatory local unions. A copy of this project labor agreement ("PLA") is included in Section 007013.

1.16 LAWS AND REGULATIONS

A. All applicable Federal, State, County, Municipal or other laws, orders, ordinances,

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- rules and regulations of all Authorities having jurisdiction over construction work in the locality of the project shall apply to the Contract and shall be deemed to be included in the Contract as if fully set forth therein at length.
- B. This project is subject to wage determination as issued by the Department of Labor. Reference Section 008700.
- C. In accordance with the requirements of General Municipal Law §103-g, the bidder is required to include with its bid either (1) the "Certification of Compliance with the Iran Divestment Act" or, in the case where the bidder is unable to make such certification, (2) the form titled "Declaration of Bidder's Inability to Provide Certification of Compliance with the Iran Divestment Act".

1.17 ARREARS

A. No bids will be accepted from, or contracts awarded to, any person, persons, firms or vendors who are in arrears to the Municipality upon debt, or contract, or who is a defaulter as surety or otherwise upon obligations to the Municipality.

1.18 NONDISCRIMINATION

A. Notwithstanding implementation of the Owner's Affirmative Action Plan, if any, all Contractors and Subcontractors of all tiers and vendors will be required to comply with all provisions of the Civil Rights Act of 1964, Executive Order 11246 of 24 September 1965 and the relevant "Laws", "Acts" rules, regulations and orders of the Labor Department of the State of New York as amended.

1.18 TIME OF COMPLETION AND CHANGES TO THE WORK

- A. Work set forth in the Contract Documents shall commence as stated in written Notice to Proceed, Letter of Intent or execution of the Contract (whichever is earlier) and shall be completed within the time stated in Section 011000 from said Notice, Letter, or Execution (whichever is earlier).
- B. Unless otherwise provided in the Contract Documents, costs for the purposes of a Change Order shall be limited to the following:
 - Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Owners Representative 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, 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 change; and
 - 5. Costs of supervision and field office personnel directly attributable to the change.
- C. The allowance for overhead and profit included in the total cost to the Owner shall be based on the following schedule:
 - 1. For the Contractor, for Work performed by the Contractor's own forces, mark-up shall not exceed 10 percent of the value of overhead and profit.
 - 2. For the Contractor, for Work performed by the Contractor's Subcontractor, 5 percent of the amount due the Subcontractor.

- 3. For each Subcontractor, or Sub-subcontractor involved, for Work performed by that Subcontractor's own forces, mark-up shall not exceed 10 percent of the value of overhead and profit.
- 4. For each Subcontractor, for Work performed by the Subcontractor's Subsubcontractors, 5 percent of the amount due the Sub-subcontractor.
- D. In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also. Back-up data will be required to be submitted as well, in the form of proposals from subcontractors and/or written quotes for materials and equipment.

End of Invitation and Instructions

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ATTACHMENT 1 – Part 155 Regulations

https://www.p12.nysed.gov/facplan/Laws_Regs/8NYCRR155.htm#_155_5_Uniform_Safety_Stds_f or Schl Constr

8 CRR-NY 155.5NY-CRR - OFFICIAL COMPILATION OF CODES, RULES AND REGULATIONS OF THE STATE OF NEW YORK

TITLE 8. EDUCATION DEPARTMENT

CHAPTER II. REGULATIONS OF THE COMMISSIONER

SUBCHAPTER J. BUILDINGS AND TRANSPORTATION

PART 155. EDUCATIONAL FACILITIES

155.5 Uniform Safety Standards for School Construction and Maintenance Projects

(a) Monitoring of construction and maintenance activities.

The occupied portion of any school building shall always comply with the minimum requirements necessary to maintain a certificate of occupancy and shall be monitored during construction or maintenance activities for safety violations by school district personnel. It is the responsibility of the board of education or board of cooperative educational services to assure that these standards are continuously maintained when the building or any portion thereof is occupied.

(b) Investigation and disposition of complaints relating to health and safety received as a result of construction and maintenance activities.

Boards of education and boards of cooperative educational services shall follow procedures established under section 155.4(d)(7) of this Part.

- (c) Pre-construction testing and planning for construction projects.
- (1) Boards of education and boards of cooperative educational services shall assure that proper planning is made for safety of building occupants during construction. For all construction projects for which bids are issued on or after September 30, 1999, such boards shall assure that safety is addressed in the bid specifications and contract documents before contract documents are advertised for bid. All school areas to be disturbed during renovation or demolition shall be tested for lead and asbestos. Appropriate procedures to protect the health of building occupants shall be included in the final construction documents for bidding.
- (2) Boards of education and boards of cooperative educational services shall establish procedures for involvement of the health and safety committee to monitor safety during school construction projects. The health and safety committees in school districts other than in cities with one million inhabitants or more shall be expanded during construction projects to include the project architect, construction manager, and the contractors. Such committee shall meet periodically to review issues and address complaints related to health and safety resulting from the construction project. In the case of a city school district in a city of one million inhabitants or more, the board of education shall submit procedures for protecting health and safety during construction to the

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commissioner for approval. Such procedures shall outline methods for compliance with this section.

- (3) The district emergency management plan shall be updated to reflect any changes necessary to accommodate the construction process, including an updated emergency exit plan indicating temporary exits required due to construction. Provisions shall be made for the emergency evacuation and relocation or release of students and staff in the event of a construction incident.
- (4) Fire drills shall be held to familiarize students and staff with temporary exits and revised emergency procedures whenever such temporary exits and revised emergency procedures are required.
- (d) Pre-construction notification of construction projects.

The board of education or board of cooperative educational services shall establish procedures for notification of parents, staff and the community in advance of a construction project of \$10,000 or more to be conducted in a school building while the building is occupied. Such procedures shall provide notice at least two months prior to the date on which construction is scheduled to begin, provided that in the case of emergency construction projects, such notice shall be provided as far in advance of the start of construction as is practicable. Such notice shall include information on the district's obligations under this section to provide a safe school environment during construction projects. Such notice requirement may be met by publication in district newsletters, direct mailings, or holding a public hearing on the project to inform parents, students, school personnel and community members.

- (e) General safety and security standards for construction projects.
- (1) All construction materials shall be stored in a safe and secure manner.
- (2) Fences around construction supplies or debris shall be maintained.
- (3) Gates shall always be locked unless a worker is in attendance to prevent unauthorized entry.
- (4) 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.
- (5) Workers shall be required to wear photo identification badges at all times for identification and security purposes while working at occupied sites.
- (f) 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 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.
- (g) Maintaining exiting and ventilation during school construction projects.

The following information shall be included in all plans and specifications for school building projects:

(1) A plan detailing how exiting required by the applicable building code will be maintained during construction. The plan shall indicate temporary construction required to isolate construction equipment, materials, people, dust, fumes, odors, and noise during the construction period. Temporary construction details shall meet code-required fire ratings for separation and corridor enclosure. At a minimum, required exits, temporary stairs, ramps, exit signs, and door hardware shall be provided at all times.

A plan detailing how adequate ventilation will be maintained during construction. The plan shall indicate ductwork which must be rerouted, disconnected, or capped in order to prevent contaminants from the construction area from entering the occupied areas of the building. The plan shall also indicate how required ventilation to occupied spaces affected by construction will be maintained during the project.

(h) Fire and hazard prevention.

Areas of buildings under construction that are to remain occupied shall maintain a certificate of occupancy. In addition, the following shall be strictly enforced:

- (1) No smoking is allowed on public school property, including construction areas.
- (2) During construction daily inspections of district occupied areas shall be conducted by school district personnel to assure that construction materials, equipment or debris not block fire exits or emergency egress windows.
- (3) Proper operation of fire extinguishers, fire alarm, and smoke/fire detection systems shall be maintained throughout the project.
- (i) Noise abatement during construction and maintenance activities.

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. Noise level measurements (dba) shall be taken with a type 2 sound level meter in the occupied space in a location closest to the source of the noise. Complaints regarding excessive noise shall be addressed through the health and

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safety committee. The district should anticipate those times when construction noise is unacceptable and incorporate "no work" periods into the bid specifications.

(j) Control of chemical fumes, gases, and other contaminants during construction and maintenance projects.

The bid specifications and construction contracts for each construction project shall indicate how and where welding, gasoline engine, roofing, paving, painting or other fumes will be exhausted. Care must be taken to assure fresh air intakes do not draw in such fumes.

- (1) The bid specifications shall require schedules of work on construction and maintenance projects which include time for off-gassing of volatile organic compounds introduced during construction before occupancy is allowed. Specific attention is warranted for activities including glues, paint, furniture, carpeting, wall coverings, and drapery. Manufacturers shall be contacted to obtain information regarding appropriate temperatures and times needed to cure or ventilate the product during use and before safe occupancy of a space can be assured. Building materials or furnishings which off-gas chemical fumes, gases, or other contaminants shall be aired out in a well ventilated heated warehouse before it is brought to the project for installation or the manufacturer's recommended off-gassing periods must be scheduled between installation and use of the space. If the work will generate toxic gases that cannot be contained in an isolated area, the work must be done when school classes and programs are not in session. The building must be properly ventilated and the material must be given proper time to cure or off-gas before re-occupancy.
- (2) Manufacturer's material safety data sheets (MSD) shall be maintained at the site for all products used in the project. MSDS must be provided to anyone who requests them. MSDS indicate chemicals used in the product, product toxicity, typical side effects of exposure to the product and safe procedures for use of the product.
- (k) Asbestos abatement protocols.

All asbestos abatement projects shall comply with all applicable Federal and State laws including but not limited to the New York State Department of Labor industrial code rule 56 (12 NYCRR 56), and the Federal Asbestos Hazard Emergency Response Act (AHERA), 40 CFR part 763 (Code of Federal Regulations, 1998 Edition, Superintendent of Public Documents, U.S. Government Printing Office, Washington, DC 20402; 1998; available at the Office of Facilities Planning, Education Building Annex, Room 1060, State Education Department, Albany, NY 12234). Large and small asbestos projects as defined by 12 NYCRR 56 shall not be performed while the building is occupied. Minor asbestos projects defined by 12 NYCRR 56 as an asbestos project involving the removal, disturbance, repair, encapsulation, enclosure or handling of 10 square feet or less of asbestos or asbestos material, or 25 linear feet or less of asbestos or asbestos material may be performed in unoccupied areas of an occupied building in accordance with the above referenced regulations.

(I) Lead paint.

Any construction or maintenance operations which will disturb lead based paint will require abatement of those areas pursuant to protocols detailed in the "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing" (June 1995; U.S. Department of Housing and Urban Development, Washington, D.C. 20410; available at the Office of Facilities Planning,

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Education Building Annex, Room 1060, State Education Department, Albany, NY 12234). All areas scheduled for construction as well as areas of flaking and peeling paint shall be tested for the presence of lead and abated or encapsulated in accordance with the above noted guidelines.

(m) Radon.

Districts shall take responsibility to be aware of the geological potential for high levels of radon and to test and mitigate as appropriate. This information is available from the New York State Department of Health Radon Measurement Database.

(n) Post construction inspection.

The school district or board of cooperative educational services shall provide the opportunity for a walk-through inspection by the health and safety committee members to confirm that the area is ready to be reopened for use.

8 CRR-NY 155.5

Current through April 15, 2021

Primary Source:

https://govt.westlaw.com/nycrr/Document/I3662bca9c22211ddb29d8bee567fca9f?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)

From https://dos.ny.gov/state-register, click State Register's New York Codes, Rules and Regulations "Search" button:

https://govt.westlaw.com/nycrr/index? IrTS=20190327201930309&transitionType=Default&contextData=%28sc.Default%29

003100 - INFORMATION AVAILABLE TO BIDDERS

1.1 GENERAL

- A. Site Information: Data in subsurface investigation reports included herein are provided to the Contractor for information only. Conditions are not intended as representations or warranties of accuracy or continuity between soil borings. The Owner will not be responsible for interpretations or conclusions drawn from this data by Contractor.
 - 1. Additional test borings and other exploratory operations may be performed by Contractor, at the Contractor's option; however, no change in the Contract Sum will be authorized for such additional exploration.
- B. Hazardous Material Information: Data in hazardous material investigation reports included herein are provided to the Contractor for information only. Conditions are not intended as representations or warranties of accuracy or continuity between sampling locations. The Owner will not be responsible for interpretations or conclusions drawn from this data by the Contractor.

END OF SECTION 003100

Tectonic

PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

GEOTECHNICAL EVALUATION PROPOSED SITE IMPROVEMENTS OR ANGE-ULSTER BOCES GIBSON ROAD CAMPUS 53 GIBSON ROAD

VILLAGE OF GOSHEN, ORANGE COUNTY, NEW YORK

Submitted To:

KG+D Architects, PC

285 Main Street Mount Kisco, New York 10549

October 9, 2023

W.O. 12105.01-REV 1

Submitted By:

Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C.

1279 Route 300, 2nd Floor Newburgh, NY 12550

(P) 845.567.6656 (F) 845.567.6248



KG+D Architects, PC 285 Main Street Mount Kisco, New York 10549

Attention: Mr. Brian Mangan, AIA – Principal

VIA E-MAIL (bmangan@kgdarchitects.com)

October 9, 2023

RE: W.O. 12105.01-REV 1

GEOTECHNICAL INVESTIGATION

ORANGE-ULSTER BOCES - GIBSON ROAD CAMPUS

53 GIBSON ROAD

VILLAGE OF GOSHEN, ORANGE COUNTY, NEW YORK

Dear Mr. Mangan;

Tectonic Engineering Consultants, Geologists, and Land Surveyors D.P.C. (Tectonic) has completed a subsurface investigation and geotechnical engineering evaluation for the proposed site improvements to be performed within the Orange-Ulster BOCES Gibson Road campus, located in the Village of Goshen, Orange County, New York. The purpose of the investigation was to characterize the subsurface conditions at the site and to develop geotechnical design and construction criteria for proposed improvements, which we understand may consist of the construction of a new entrance addition, and new classroom buildings. This report presents our findings and recommendations.

We appreciate this opportunity to assist you with this project. If you have any questions regarding this report, please do not hesitate to contact the undersigned.



Newburgh Office

GEOTECHNICAL EVALUATION ORANGE-ULSTER BOCES PROPOSED SITE IMPROVEMENTS GIBSON ROAD CAMPUS VILLAGE OF GOSHEN, ORANGE COUNTY, NEW YORK

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1.0 INTRODUCTION

In accordance with your request and authorization, Tectonic Engineering Consultants, Geologists, and Land Surveyors D.P.C. (Tectonic) has completed a subsurface investigation and geotechnical engineering evaluation for the proposed site improvements within the Gibson Road campus of Orange-Ulster BOCES, located in the Village of Goshen, Orange County, New York. The purpose of the investigation was to evaluate the subsurface conditions within the areas of improvements, and to provide geotechnical recommendations for design and construction. This report presents detailed information about the investigations, our findings, and recommendations.

2.0 <u>SCOPE OF SERVICES</u>

The geotechnical investigation was performed for KG+D Architects, hereafter referred to as the Client. The scope of the geotechnical investigation consisted of the following:

- Review of geological information publicly available through the United States Geological Survey (USGS) and the National Resources Conservation Service (NRCS).
- Drilling, sampling, and logging of eleven (11) borings to depths up to 22 feet bgs within the areas of the proposed site improvements.
- Field inspection by a Tectonic representative, working under the purview of a New York State licensed Professional Engineer, to locate the borings; obtain samples for laboratory testing; and log and classify all soil samples.
- Laboratory testing of soil samples selected to verify the field classifications of the soils, and to evaluate the engineering characteristics of the soil.
- Geotechnical engineering analyses of the subsurface conditions and laboratory test results as they relate to the proposed building additions.
- Preparation of this report presenting the results of the subsurface investigation, engineering analyses, and our geotechnical recommendations for the design and construction for the geotechnical aspects of the proposed building additions.

3.0 <u>SITE AND PROJECT DESCRIPTIONS</u>

The project site is within the Gibson Road campus of Orange-Ulster BOCES (OUBOCES), located at 53 Gibson Road, in the Village of Goshen, Orange County, New York. The Gibson Road campus of OUBOCES consists of multiple buildings, asphalt-paved parking lots, and asphalt-paved drive aisles. The Gibson Road campus is bound by Gibson Road to the north, residential homes to the west and east, and wooded land to the south.



Based on a site plan provided by the Client, the site contains the existing two-story Emanuel Axelrod Education Center (EAEC) building in the northern portion of the site, which is bordered by asphalt-paved parking lots to the north, a concrete courtyard to the east, landscaped areas to the west, and the existing one-story administration building to the south. The existing one-story Career & Technical Education Center (CTEC) is located within the southern portion of the campus and is bordered by asphalt-paved parking lots to the north, west and east, and the existing one-story 400 Building to the south.

Based on a topographic survey provided by the Client, surface elevations across the site generally slope downwards from south to north. Within the concrete courtyard adjacent to the EAEC building, the surface elevations are relatively level, with spot elevations provided at approximately +493 feet. According to the topographic survey, the finished floor elevation (FFE) of the existing EAEC building is approximately +493.4 feet. At the CTEC building, surface elevations throughout the perimeter asphalt-paved parking lots are relatively level, with spot elevations between approximately +499 and +500 feet. The FFE of the CTEC building and the 400 Building are approximately +499 feet. All elevations referenced herein are per the North American Vertical Datum of 1988 (NAVD88).

Based on documents provided by the Client, the proposed site improvements will reportedly consist of the construction of a proposed entrance addition adjacent to the eastern face of EAEC, that will connect to the administration building. The entrance addition will reportedly be one-story, with a double-height lobby. Other improvements will reportedly consist of the demolition of the 400 Building, and the construction of classroom buildings adjacent to the north and south faces of the west wing of the CTEC building. The CTEC classroom buildings will reportedly be one-story, double-height buildings. Both buildings are proposed to have additions that connect to the main CTEC building. Structural loading values for the new buildings were not available as of the writing of this report. Grading plans were not available, but no significant re-grading is anticipated to construct the proposed buildings and addition.

4.0 SUBSURFACE INVESTIGATION

The overall subsurface investigation consisted of the drilling, sampling, and logging of eleven (11) total borings, designated as GR-1 through GR-10, and GR-8A. Borings GR-1 and GR-2 were advanced within the approximate footprint of the proposed entrance addition; borings GR-3 through GR-8 and GR-8A were advanced within the approximate footprint of the southern classroom building; borings GR-9 and GR-10 were advanced within the approximate footprint of the northern classroom building. Boring GR-8A was offset approximately 10 feet north



of boring GR-8 due to an encountered obstruction. The borings were generally performed at the Client-requested locations. The boring locations are shown on the attached Boring Location Plan, Figure 1.

Boring GR-10 was drilled by Core Down Drilling, LLC, using a Geoprobe 6712DT track-mounted drill rig, equipped with an automatic hammer on July 6, 2023. Borings GR-1 through GR-9 and GR-8A were drilled by Limited Access Drilling Services, LLC using an Acker Recon track-mounted drill rig, equipped with an automatic hammer between July 27 and 31, 2023, and August 22, 2023. The borings were advanced using 3-¼-inch inside diameter hollow-stem augers. Standard Penetration Testing was conducted with a split-spoon sampler continuously to depths up to 12 feet, and then 5-foot maximum intervals thereafter. SPT sampling was performed in general accordance with the requirements of ASTM Standard D1586 *Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils*". SPT N-values were recorded for each soil sample taken. Samples of the soil obtained during the investigation were retained in glass jars and are currently stored at our material testing laboratory. The boreholes were backfilled with drill cuttings to match the existing conditions. Boreholes within existing roadways were finished with cold patch asphalt, as required.

All drilling, sampling, and logging of the borings were observed on a full-time basis by a Tectonic representative, working under the supervision of a Professional Engineer licensed in the State of New York. The representative observed the subsurface investigation, classified soil samples as they were recovered, collected representative soil samples for laboratory testing, and prepared logs of the soil and groundwater conditions encountered. Soil samples were classified in accordance with the latest edition of the New York State Building Code (Code), the modified Burmister Soil Classification System, and the Unified Soil Classification System (USCS) (ASTM D2488). Copies of the boring logs are included in Appendix I.

5.0 LABORATORY TESTING

Laboratory testing was performed on soil samples selected to assist in evaluating the engineering properties of the encountered soils and to verify the field identifications of the soils. Testing included the performance of seven (7) grain-size distribution tests, performed in general accordance with ASTM Standard D6913. The results of the laboratory testing are included in Appendix II.



6.0 OVERALL SUBSURFACE CONDITIONS

A review of USGS and New York State geologic maps indicates that the site is generally underlain by gravelly sand loam. Based on the results of the subsurface investigation, the site is generally underlain by a thin layer of fill soils and native glacial till soils. The following subsections provide generalize descriptions of the soil and groundwater conditions.

As noted above, an automatic hammer was used in the SPT sampling of the borings. Given that an automatic hammer imparts more energy into the split spoon sampler than a safety hammer (N_{60}); the standard hammer used for most geotechnical engineering calculations; an energy correction factor of 1.3 is applied to the field N-values to obtain the N_{60} -values.

6.1 EAEC Entrance Addition

6.1.1 Fill Soils

Underlying approximately 6 inches of concrete within the courtyard, fill soils were observed within both borings. The fill soils generally consisted of variable-colored coarse-to-fine gravel, and silt, with varying amounts of coarse-to-fine sand. The fill soils were generally observed to a depth of 2 feet bgs. Field SPT N-values within the fill soils ranged from 13 to 20 blows per foot (bpf). When corrected, SPT N_{60} -values ranged between approximately 17 and 26 bpf, indicating a medium dense condition. Based on the composition of the fill soils, they are likely re-worked native soils that were placed during construction of the EAEC building. The fill soils have USCS designations of GM and ML.

6.1.2 Native Soils

Underlying the fill soils, native soils were encountered to the termination depth of the borings. The native soils generally consisted of glacial till, comprised of layers of silt and coarse-to-fine sand. The field SPT N-values of the native soils ranged from 9 to 42 bpf. When corrected, SPT N_{60} -values ranged from approximately 12 to 55 bpf, indicating a medium dense to very dense condition. The native soils were generally observed to be in a medium dense to dense condition, and generally increases in density with depth. The native soils have USCS designations of SM and ML.



6.1.3 Groundwater

Groundwater in the form of saturated samples were observed within boring GR-2 at a depth of approximately 15 feet bgs. Groundwater may be encountered at other depths at other times, and with changing weather conditions. Groundwater may also be encountered in a perched condition in the more fine-grained material.

6.2 CTEC - Southern Classroom Building

6.2.1 Fill Soils

Underlying approximately 2 inches of asphalt pavement and 2 inches of gravel subbase, or a thin veneer of topsoil-like material, fill soils were encountered to a depth of approximately 2 feet bgs and were generally comprised of variable-colored medium-to-fine sand, with varying amounts of coarse-to-fine gravel and fines. The field SPT N-values ranged between 4 and 32 bpf. When corrected, the SPT N₆₀-values ranged between approximately 5 and 42 bpf, indicating a loose to dense condition. The fill soils were generally observed in a medium dense condition and were likely placed during the construction of asphalt-pavement sections around the CTEC building. The fill soils have a USCS designations of SM.

6.2.2 Native Soils

Underlying the fill soils, native glacial till soils, comprised of layers of sand, gravel, and silt were encountered to the termination depth of the borings. The field SPT N-values within the native soils ranged from 9 to 111 bpf. When corrected, SPT N_{60} -values ranged from approximately 12 to 144 bpf, indicating a medium dense to very dense condition. The native soils were generally observed in a medium dense to dense condition, and generally increased in density with depth. It should be noted that boulders were likely encountered within borings GR-8 and GR-8A at depths of between 4 and 9 feet bgs. The native soils have USCS designations of SM, GM, and ML.

6.2.3 Groundwater

Groundwater in the form of saturated samples was observed between approximately 8 and 10 feet within borings GR-5 and GR-7, and at approximately 19 feet within boring GR-3. The saturated samples observed within borings GR-5 and GR-7 may have been observed in a



perched condition overlying a layer of silt. Groundwater may be encountered at other depths at other times, and with changing weather conditions.

6.3 CTEC - Northern Classroom Building

6.3.1 Fill Soils

Underlying approximately 2 to 3 inches of asphalt pavement, and 2 to 3 inches of gravel subbase, the fill soils generally consisted of variable-colored coarse-to-fine sand with coarse-to-fine gravel and fines, or silt, with coarse-to-fine sand and fine gravel. The fill soils were likely placed during the construction of the existing asphalt pavement sections. Field SPT N-values within the fill soils ranged from 9 bpf to sampler refusal, which is defined as less than 6 inches of sampler penetration for 50 blows of the hammer. When corrected, SPT N_{60} -values ranged from approximately 12 bpf to sampler refusal, corresponding to a medium dense to very dense condition. Fragments of brick were observed within the fill soils within boring GR-9, which may have obstructed the advancement of the split-spoon. The fill soils have a USCS designation of SP and ML.

6.3.2 Native Soils

Underlying the fill soils, the native glacial till soils generally consisted of layers of coarse-to-fine sand, with varying amounts of coarse-to-fine gravel and fines. Field SPT N-values within the native soils ranged from 13 to 32 bpf. When corrected, SPT N_{60} -values ranged from approximately 17 to 42 bpf, indicating a medium dense to dense condition. The native soils have USCS designations of SM.

6.3.3 Groundwater

Groundwater in the form of saturated samples were not observed to the termination depth of the borings. Groundwater may be encountered at other depths at other times, and with changing weather conditions. Groundwater may also be encountered in a perched condition in the more fine-grained material.



7.0 <u>SEISMIC SITE COEFFICIENTS AND LIQUEFACTION POTENTIAL</u>

As previously noted, borings were advanced to a maximum depth of 22 feet. Per ASCE 7, site classification is based on the upper 100 feet of the soil profile. When site specific data is not available to 100 feet, as is the case with this site, appropriate soil properties are permitted to be estimated based on known geologic conditions. Based on the results of the subsurface investigation and the criteria outlined in the current edition of the Code, the subsurface conditions underlying the site should be considered Class D, with maximum spectral response accelerations at short periods (S_{MS}) of 0.360g and at 1-second periods (S_{MI}) equal to 0.133g. Based on the procedures outlined in the Code and ASCE 7-16, the corresponding five-percent damped design spectral response acceleration at short periods, S_{DS} , is equal to 0.240g, and at 1-second period, S_{D1} , is equal to 0.089g. For this site location, the USGS, using their 2014 dynamic model, anticipates an earthquake moment magnitude of 5.54, producing a rock surface Peak Ground Acceleration (PGA) of 0.130g. Combining the rock surface PGA with a PGA factor of 1.539, for a Class D site, results in a design PGA of 0.201q.

Liquefaction of soils can be caused by strong vibratory motion due to earthquakes. Both research and historical data indicate that loose, granular soils saturated by a shallow groundwater table are most susceptible to liquefaction. Liquefaction occurs when an earthquake and associated ground shaking of sufficient duration results in the loss of grain-to-grain contact due to a rapid increase in pore-water pressure, causing the soil to behave as a fluid for short periods.

An analysis was performed to evaluate the liquefaction potential at the site, in accordance with the Code, using a procedure recommended by Youd et. al. (2001). This method estimates the stresses likely to be induced by an earthquake and the stresses likely to initiate liquefaction using the SPT N-values, the effective overburden pressure, and the peak horizontal ground acceleration caused by the design seismic event. The factors of safety against liquefaction were computed by the ratio of cyclic shear strength of the soil to the cyclic shear stress induced by the seismic event. Using a design earthquake magnitude of 5.54 and the peak horizontal ground acceleration of 0.201g, specified by the Code and reported by the USGS, the liquefaction analysis indicates that the subsurface soils have a factor of safety against liquefaction greater than the generally accepted minimum of 1.0. Subsequently, the soils underlying the site are unlikely to liquefy during the design earthquake.



8.0 <u>DISCUSSION AND CONCLUSIONS</u>

The proposed project consists of various site improvements throughout the Gibson Road campus. As of the writing of this report, the improvements will reportedly include the construction of an entrance addition adjacent to the eastern face of the EAEC building, the demolition of the 400 Building, and the construction of two classroom buildings adjacent to the CTEC building. Based on the conditions encountered during the subsurface investigation, construction of the proposed buildings and addition are feasible from a geotechnical standpoint.

The new entrance addition to EAEC is proposed to be constructed in the footprint of the existing concrete courtyard and will reportedly connect the main EAEC building to the administration building. The subsurface conditions within the footprint of the entrance addition generally consisted of medium dense granular fill soils, and medium dense to dense native glacial till soils. The bearing depth of the main EAEC and administration buildings are not known as of the writing of this report; per the provided topographic survey, both the EAEC and the administration buildings have an FFE of approximately +493 feet. It is assumed that the portions of the addition that will connect the two buildings will be constructed to match their respective building's bearing depth, so that underpinning of the existing foundations will not be required. For the purposes of this report, it is assumed that the existing EAEC and administration building foundations bear at a depth of approximately 4 feet, corresponding to an elevation of approximately +489 feet. The depth of the existing building foundations should be verified during construction. At the assumed bearing depth, the native soils were generally observed to be in a dense to very dense condition, which are suitable for foundation support. It should be noted that the soils at the assumed bearing elevation have a relatively high proportion of fines. If the soils are allowed to get wet, they will soften and experience a reduction in load-carrying capacity when exposed to moisture and are disturbed. The soils are also frost susceptible and could become disturbed if allowed to freeze during construction.

Two classroom buildings are proposed to be constructed adjacent to the west wing of CTEC, with additions that will connect to the main CTEC building. Within the footprint of the southern classroom building, the subsurface conditions generally consisted of loose to medium dense granular fill soils, and medium dense to dense native glacial till soils. Within the footprint of the northern classroom building, the subsurface conditions generally consisted of very dense granular fill, and medium dense to dense native glacial till. The soil conditions within the footprints of both proposed classroom buildings are suitable for foundation support.



Based on the provided topographic survey, the west wing of the CTEC, and the existing 400 Buildings have FFEs of approximately +499 feet. The depth of the west wing foundation is not known; for the purposes of this report, the foundation is assumed to bear at a depth of 4 feet bgs, corresponding to an elevation of approximately +495 feet. As the two classroom buildings are planned to be constructed directly adjacent to the existing west wing, they should be constructed to match the depth of the existing foundations. The bearing depth of the west wing building should be verified during the construction phase. It should be noted that the southern classroom building is being constructed in the footprint of the existing 400 Building. All existing floor slabs and footings must be removed from the zone of influence of the new building foundations. Properly compacted structural fill may need to be placed after removal of the remnant footings and slabs.

Due to the relatively high fines content of the on-site soils, they should be considered to be sensitive to disturbance during excavation and/or compaction, when exposed to water. Therefore, it is critical that care be taken during construction of foundations to prevent undue wetting of the soils. The soils are also expected to have relatively low permeability, and to be difficult to dewater. Grading of the foundation subgrades to shed water and to prevent ponding will also be critical to prevent disturbance of the existing soils. Both of these conditions may require subgrade remediation during the construction of the new structures, if adequate protection cannot be maintained. Subgrade disturbance can be minimized by using proper subgrade preparation techniques, as described in Section 10 of this report.

The following are other general conclusions that can be made regarding the proposed construction:

- Excavation should be feasible with conventional construction equipment; however, it should be noted
 that boulders were encountered within the vicinity of the southern classroom building and may be
 encountered at other areas around the site. Construction debris and oversized materials may be
 encountered during excavation within the footprint of the 400 Building.
- The soils found on-site are typically not suitable for use as structural fill, because of their high fines content. The existing fill and native soils should not be used as backfill behind foundation walls, because their high fines content will impede the proper drainage of the backfill. If used for general fill, these soils are moisture sensitive, and should be at or below optimum moisture content when placed and compacted, to achieve the specific degree of compaction and to provide a stable subgrade. Construction delays should be expected, if the on-site soils are used.
- The results of our liquefaction analysis indicate that the soils underlying the site are unlikely to liquefy.
- Monitoring should be performed to document that the construction does not adversely impact the neighboring structures. Monitoring should include surveying to identify both horizontal and vertical movement of the adjacent structures. Monitoring should also include measuring vibration levels



during construction document that they are within acceptable limits, and the performance of preconstruction conditions surveys of adjacent structures.

9.0 RECOMMENDATIONS

The following sections provide our geotechnical recommendations for design and construction of the proposed structures. The recommendations are based on our understanding of the proposed construction, as described in Section 3, the results of our subsurface investigation and our experience in the general vicinity of the project site.

9.1 EAEC Entrance Addition Foundations

The proposed EAEC entrance addition can be supported on conventional continuous wall footings that bear on native medium dense or better soils, or compacted structural fill. The bearing depth of the EAEC and administration buildings are not known; based on a FFE of +493 feet, it is assumed that the existing foundations bear at a depth of approximately 4 feet bgs, corresponding to an elevation of +489 feet. The portions of the addition that will connect to the main EAEC and administration buildings should be constructed to match their respective bearing depths. All foundations should be constructed at a depth of 4 feet bgs for frost protection. Shallow foundations can be designed for a maximum net allowable bearing capacity of 4,000 pounds per square foot (psf). Section 10 of this report provides the subgrade preparation procedures necessary to achieve the recommended bearing capacity.

Using the above design criteria, total settlement of the proposed building is estimated to be up to 1 inch and differential settlements are estimated to be less than 0.5 inch. The differential settlement is estimated over a distance of about 30 feet along continuous footings. Continuous wall footings should have a minimum width of 2 feet, and isolated spread footings should have a minimum width of 3 feet.

9.2 CTEC Classroom Building Foundations

The proposed classroom buildings to be constructed adjacent to CTEC can be supported on conventional shallow footings that bear on the native medium dense soils, or compacted structural fill. The bearing depth of the existing west wing building foundation is not known; based on an FFE of +499 feet, it is assumed that the foundations will be constructed to match the existing building and will bear at a depth of approximately 4 feet bgs, corresponding to an elevation of +495 feet. All footings should bear at least 4 feet below the outside grade, for frost protection. Shallow foundations can be designed for a maximum



net allowable bearing capacity of 4,000 psf. Section 10 of this report provides the subgrade preparation procedures necessary to achieve the recommended bearing capacity.

It should be noted that the southern classroom addition is proposed to be constructed within the footprint of the existing 400 Building, which will be demolished prior to construction. Assuming that the southern classroom building foundations are constructed to bear at the same bearing depth as the 400 Building, it is likely that the soils at the bearing depth will be disturbed during demolition and removal of the remnant footings and slabs. If the soils at the bearing depth are deemed to be unsuitable due to disturbance during demolition, they should be undercut by a minimum of 6 inches, and replaced with compacted, structural fill. Structural fill should be placed per the guidelines provided in Section 10 of this report.

Using the above design criteria, total settlement of the proposed building is estimated to be up to 1 inch and differential settlements are estimated to be less than 0.5 inch. The differential settlement is estimated over a distance of about 30 feet along continuous footings. Continuous wall footings should have a minimum width of 2 feet, and isolated spread footings should have a minimum width of 3 feet.

9.3 Slab-On-Grade Floors

Slab-on-grade floors should be supported on a minimum 6-inch-thick layer of free draining ½ to ¾-inch crushed stone placed over the existing in-place soils, or structural fill subgrades. If encountered, any loose or disturbed soils that are encountered below the slab-on-grades should be removed and replaced with compacted structural fill prior to placement of crushed stone. Within the footprint of the southern classroom building, it is anticipated that the slab-on-grade subgrade will need to be replaced with structural fill after the demolition of the remnant slab. All moisture-sensitive floor slabs should be constructed above a vapor barrier, consisting of a polyethylene membrane with a minimum thickness of twenty (20) mils. A coefficient of friction of 0.3 should be used between the slab and the vapor barrier.

A subgrade modulus of 150 pounds per cubic inch (pci) is recommended for design of slab-on-grade floors bearing on 6 inches of crushed stone base placed above the existing fill. The design should be in accordance with the latest edition of the American Concrete Institute (ACI 360). The subgrade modulus is suitable for estimating distributions of bearing pressure beneath the slab and for estimating bending moments and shears within the slab. It is not intended for calculating total or differential settlements.



9.4 Design for Lateral Loading of Walls

Below-grade walls and temporary shoring should be designed in accordance with the following criteria:

Table 9.4.1 – Lat	eral Load Parameters	
Soil Parameter	On-Site Soil	Structural Fill
Angle of Internal Friction	30°	34°
Active Earth Pressure Coefficient (K _a) ¹	0.33	0.28
Passive Earth Pressure Coefficient (K _p) ²	3.00	3.54
At-Rest Earth Pressure Coefficient (K ₀) ³	0.50	0.44
Unit Weight of Soil (pounds per cubic foot)	115	130

- 1) Use for freestanding walls, such as retaining walls, where movement of up to 0.0015 X height of wall is both possible and tolerable. Otherwise, use at-rest coefficient.
- 2) Reduce passive pressure by half above a depth of 4 feet below exterior grade to account for disturbance caused by frost action.
- 3) Use for walls restrained against outward lateral movement, such as foundation walls.

Additional loading due to temporary and permanent surcharges should be added to the lateral loading exerted by the retained soil. Loads due to supported structures should be applied in appropriate combinations with the lateral loads. Walls should be backfilled in accordance with Section 10 of this report.

9.5 Groundwater and Foundation Drainage

Based on the results of our subsurface investigation, it is not anticipated that groundwater will significantly affect the construction of the foundations of the classroom buildings and the entrance addition. However, perched groundwater may be encountered during the construction phase. Rainwater and surface water may also become trapped in excavations. If necessary, dewatering can be performed with sump pumps and should be performed to allow work to be performed in the dry. Any dewatering should prevent loosening or migration of the subgrade soils. The dewatering system, if necessary, should be designed by a New York State licensed Professional Engineer.

Grading of the surface of the backfill and the surrounding topography and pavements should provide positive drainage away from the walls. Roof drains should be positively drained to areas away from the building.



10.0 <u>EARTHWORK CONSTRUCTION CRITERIA</u>

The following sections present our recommendations regarding earthwork and construction monitoring.

10.1 General Site Preparation

Initially, the footprints of all proposed improvement areas should be cleared and grubbed, then stripped of all existing fill, pavement, topsoil and debris. The clearing and grubbing should extend at least 5 feet beyond the planned structures to be constructed. The foundations of the 400 Building should be completely removed during demolition, including all floor slabs, reinforcement steel, and concrete debris. Debris and vegetation from the clearing operations should be removed from the site and disposed of at a legal disposal facility. All soft or unsuitable materials and subsurface obstructions should be removed from the improvement area and the zone of influence of the slab-on-grade or foundation as appropriate. The zone of influence is defined by 1:1 (horizontal to vertical) planes sloping downward and outward from the bottom edges of the slab or footing.

Any existing utilities within the project limits should be re-routed around the foundations or removed. The resulting excavations should be backfilled with structural fill in accordance with the procedures outlined in Section 10.3. Trench excavations should be properly benched to allow for adequate compaction.

10.2 Subgrade Preparation

All foundation subgrades should be inspected by the geotechnical engineer prior to the placement of structural fill, or concrete. Any cut areas of the sites should be lowered to the planned subgrade depth, and the exposed native soils should be proofrolled to observe for potentially yielding soils. In any proposed fill areas, the surface should be cleared and grubbed, and the resulting subgrade prior to fill placement should also be proofrolled. Areas to receive structural fill should also be proofrolled before placing any backfill materials.

The foundation subgrades, and any surfaces to receive structural fill or concrete should be proofrolled under the observation of the geotechnical engineer. Proofrolling should be accomplished by making a minimum of four (4) passes in perpendicular directions with a 10-ton roller in open areas, or a 1.5-ton trench roller, where access is confined. Proofrolling should not be performed on saturated soils or in areas having freestanding surface water, until they are dewatered and allowed to dry. Proofrolling soils



that exceed the optimum moisture content may disturb the soils, resulting in more unfavorable conditions. Unsuitable materials or areas identified to be soft by the geotechnical engineer, based on visual inspection and observation of proofrolling operations should be removed and replaced with compacted structural fill. Any subgrade soils found to be soft and yielding during proofrolling, or otherwise deemed unsuitable by the geotechnical engineer, should be removed and replaced with properly compacted structural fill.

10.3 Fill and Backfill Materials

Imported structural fill should be well-graded granular soil that meets the general gradation requirements for New York State Department of Transportation (NYSDOT) Type 2 Aggregate Subbase (Item 304.12), and as follows:

Sieve Size	Percent Finer by Weight
2 Inch	100
1/4 Inch	25 to 60
No. 40	5 to 40
No. 200	0 to 10

Based on the results of our subsurface investigation and laboratory testing the native soils are not suitable for use as structural fill, due to the high fines content. Any soils that are to be used as structural fill should be tested and approved by the geotechnical engineer prior to use.

Non-conforming native soils may be suitable for use as general fill in landscaped areas, provided they are free of trash, debris, roots, vegetation, or other deleterious materials. It should be noted that use of soils containing moderately high fines contents (such as those encountered at the site) will likely cause construction delays during the winter months, following periods of wet weather, or if the material is wet when excavated.

All general fill and structural fill should be compacted to at least 95 percent of the maximum dry density, at near optimum moisture contents, as determined by the modified Proctor test (ASTM D1557). The degree of compaction should be tested and documented by a geotechnical engineer for each lift of fill. The lift thickness for the structural fill soils will vary depending on the type of compaction equipment used. Structural fill should generally be placed in uniform horizontal lifts not exceeding 8 inches in loose thickness when using a 10-ton roller. In confined areas, the loose lift thickness should be 4 inches or less and each lift should be compacted with sufficient passes of hand operated vibratory or impact compaction equipment.



Backfill in landscape areas should be compacted to at least 95 percent of the maximum dry density, at near optimum moisture contents, as determined by the ASTM D1557. A geotechnical engineer with appropriate field and laboratory support should inspect all subgrades, approve materials for use as fill, and test backfill materials for compliance with the recommended compaction.

Free draining crushed stone placed below floor slabs and as drainage materials behind foundation walls should be Underdrain Filter Type I materials (Item No. 733.2001) as specified in the NYSDOT Standard Specifications and as follows:

Sieve Size	Percent Finer by Weight
1 inch	100
1/2 inch	30 - 100
1/4 inch	0 - 30
No. 10	0 - 10
No. 20	0 – 5

10.4 Protection of Subgrades and Construction Dewatering

Approved soil subgrades should be protected from the effects of frost, construction traffic, perched groundwater, surface water and precipitation. The necessary protection should be provided as soon after approval by the geotechnical engineer as is practicable and should be maintained until coverage with compacted fill or gravel. It is recommended that temporary surface drainage measures be installed to divert runoff away from the proposed construction limits.

Perched groundwater may be encountered during the construction phase. If necessary, dewatering should be performed in a manner that will prevent loosening or migration of the subgrade soils and performed to maintain the water level at least 1-foot below the deepest excavation. Given high fines content of the onsite soils, it is anticipated that sump pits and pumps may be suitable for dewatering. Sump pits should be placed at least 1-foot outside of excavations for every foot below the subgrade elevation that they are excavated. The dewatering system should be designed by a New York State Licensed Professional Engineer, and it should be designed to ensure that dewatering does not result in any loss of soil.

As has been previously noted, the on-site soils contain a high percentage of fines, and they will soften and experience a reduction in load-carrying capacity when exposed to moisture and disturbed. They may also become unworkable if allowed to get wet. These soils are also frost susceptible and could become disturbed



if allowed to freeze during construction. Additional excavation and material removal may be required if subgrades are allowed to be exposed for long durations without fill or concrete placement. Additionally, construction traffic could also disturb the native soils.

If maintaining subgrade stabilization during periods of wet weather is a concern, crushed stone may be placed on footing and/or floor subgrades after excavation and proofrolling. The crushed stone should be clean $\frac{1}{2}$ to $\frac{3}{4}$ inch gravel, stone, or recycled concrete, and should not exceed 6 inches in thickness.

10.5 Excavations and Shoring

Temporary excavation slopes should conform to the latest OSHA standards, including slopes permitted for specified heights and soil conditions encountered. The soils within the proposed excavations meet the description for OSHA Class C soils; therefore, the on-site soils are not capable of holding a slope steeper than approximately 1.5:1 (horizontal to vertical) without shoring. The presence of perched water, or other deleterious materials could require flatter slopes or temporary excavation support (e.g., shoring and bracing). Excavation support may also be necessary in areas where sufficient distance to provide adequate benching of slopes is not available, such as adjacent to the existing buildings. The depth of bearing of the EAEC, administration building, and the west wing of CTEC foundations are not known as of the writing of this report, but are assumed to bear at a depth of 4 feet bgs. Excavations into the existing fill and native soil should be feasible using standard construction equipment (i.e. hydraulic excavator). Cobbles and boulders should be expected within the undisturbed native soils, particularly in the vicinity of the southern classroom building.

Design of dewatering and excavation support should conform to the latest OSHA and other applicable agency requirements. Design of all excavation slopes greater than a 4-foot depth and design of sheeting, shoring, and bracing should be performed by a New York State licensed Professional Engineer. Adequate dewatering or surface-water runoff control should be provided to avoid instability and caving of soils.

11.0 CONSTRUCTION MONITORING

A geotechnical engineer familiar with the existing subsurface conditions and having the appropriate laboratory and field-testing support should be engaged by the Client to observe that all earthwork is performed in accordance with the specifications, the Code, and the criteria provided in this report. As a minimum, the following work should be performed under the observation of the geotechnical engineer:



- Foundation subgrade preparation
- Proofrolling
- Remedial removals of unsuitable soils
- Placement and compaction of fill and backfill materials
- Dewatering, if necessary
- Vibration monitoring

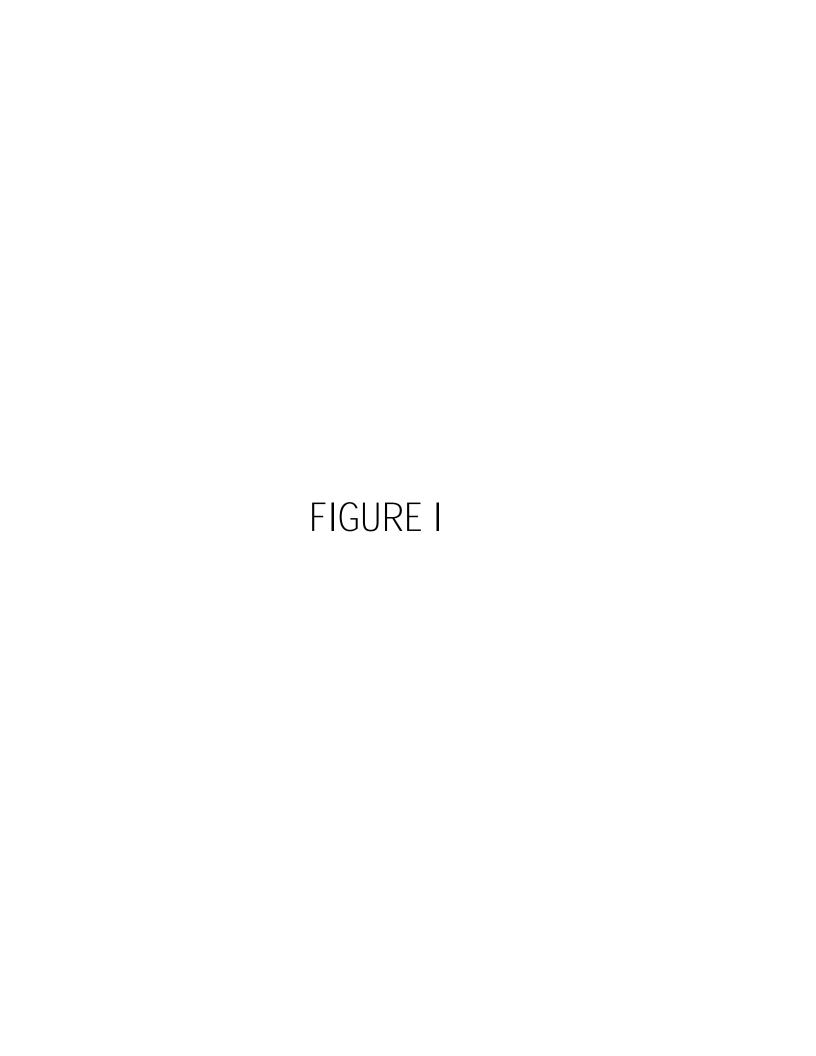
All materials proposed for use as soil fill should be tested and approved prior to delivery to the site. Additionally, all fill materials should be tested as they are being placed to verify that the required compaction is achieved. We further recommend that Tectonic be retained to review the project plans and specifications prior to completion of the bid documents.

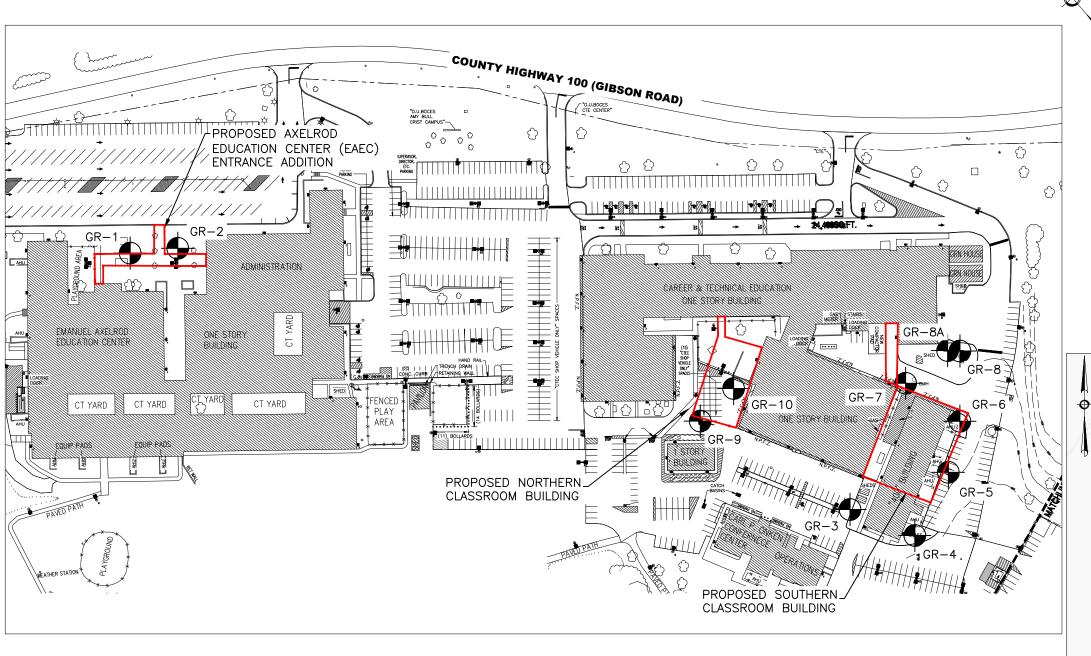
12.0 <u>LIMITATIONS</u>

Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by reputable geotechnical engineers and geologists practicing in this or similar situations. The interpretation of the field data is based on good judgment and experience. However, no matter how qualified the geotechnical engineer or detailed the investigation, subsurface conditions cannot always be predicted beyond the points of actual sampling and testing. No other warranty, expressed or implied, is made as to the professional advice included in this report. The recommendations contained in this report are intended for design purposes only. Contractors and others involved in the construction of this project are advised to make an independent assessment of the soil and groundwater conditions for the purpose of establishing quantities, schedules and construction techniques.

This report has been prepared for the exclusive use of the Client, for the specific application to the proposed construction detailed in this report. We recommend that prior to construction; Tectonic Engineering Consultants, Geologists, and Land Surveyors D.P.C. reviews the project plans and specifications. It should be noted that upon review of those documents, some recommendations presented herein might be revised or modified. In the event that any changes in the design or location of the proposed structures are planned, Tectonic shall not consider the conclusions and recommendations contained in this report valid unless reviewed and verified in writing. It is further recommended that Tectonic be retained to provide construction monitoring and inspection services to ensure proper implementation of the recommendations contained herein, which would otherwise limit our professional liability.

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|| LEGEND



APPROXIMATE BORING LOCATION

NOTES

- PLAN BASED ON A DRAWING PROVIDED BY THE CLIENT, TITLED "ORANGE ULSTER BOCES - GIBSON ROAD CAMPUS", PROVIDED IN A RFP DATED 04/24/23.
- 2. BORING LOCATIONS WERE PROPOSED BY THE CLIENT, AND WERE FIELD LOCATED BY TECTONIC.



Tectonic

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Mountainville, NY 1095 Project Contact Info 1279 Route 300 Newburgh, NY 12550

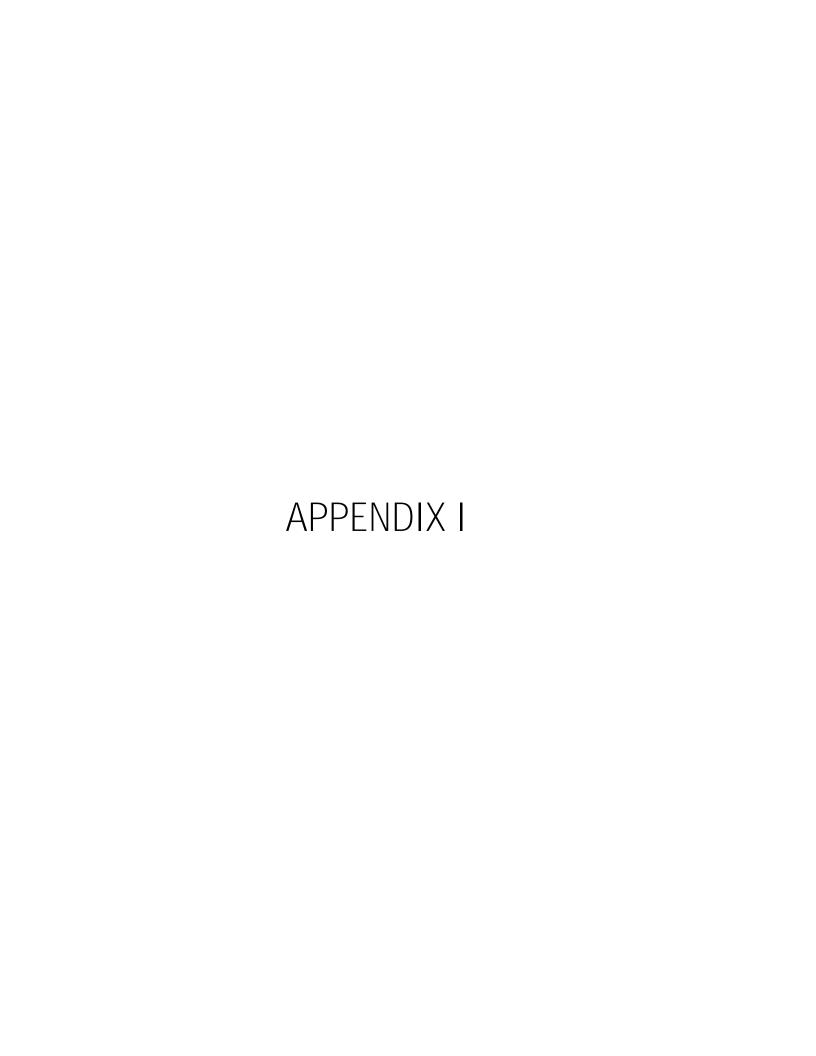
Phone: (845) 567-6656

BORING LOCATION PLAN

ORANGE ULSTER BOCES - GIBSON ROAD CAMPUS
PROPOSED SITE IMPROVEMENTS
53 GIBSON ROAD
VILLAGE OF GOSHEN, ORANGE COUNTY, NEW YORK

Date 09/25/2023	Work Order	Drawing No.	Rev
Scale 1" = 150'	12105.01	FIGURE 1	0

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								LOCATION:	Gosh	en, NY						SH	EET N	lo. 1 o	f 1	
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CASI	NG:							то	WEATH	HER: Clear	TEMP	: 75°	F		FINIS		8/22/2			
DIAM	OND C	ORE:					•	то	DEPTH	TO ROCK:	Not Encounte	ered'		UNC	ONFINE		PRESS. S/FT)	STREN	GTH	
Acker	Recon	Track Rig	with A			ner	1	I	*CHAN	GES IN STRAT	A ARE INFERRE	ΞD		1	2	2 ;	3 4 	5	5	ELEVATION (FT.)
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4 -	-	12																		Ī
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+D Arc R: Lir VANCIN ER:	rchite imited	cts, PC Acces				LOCATION:	Gosh	on NV										
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		RING	DIA.		DE	EPTH	ც >					SUR	FACE E	ELEVAT	ION:	49	93.0	
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						-		PROJECT N	o. 1210	5.01		B	DR	ING	No	o. C	3R-3	3	
Т		C	1	71	1Ĭ			PROJECT:	OUB	OCES Gibson	Road								
								LOCATION:	Gosh	en, NY						SH	EET N	o. 1 of	1
CLIEN	NT: K	G+D Arc	hitect	s, PC					9 %	DATE	TIME	DEP	TH	INSP	ECTOF	R: D i	rew Bu	gna	
CONT	TRACT(OR: Lin	nited A	Access	Drillin	ng Se	rvices,	LLC	GROUND					DRIL	LER:	Za	ack Bol	land	
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POW	ER AU	GER:			3 1/4"	•	0	TO 19'	MON. V	/ELL	YES	X N	0	DATU	JM:	5	See Rer	marks	
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CASII	NG:							ТО	WEATH	IER: Clear	TEMP	: 81° F	=		FINIS		7/27/2		
DIAM	OND C	ORE:						ТО	DEPTH	TO ROCK:	Not Encounte	red'		UNC	ONFINE ONFINE		PRESS. S S/FT)	STRENGT	
Acker		Track Rig	with A			er			*CHAN	GES IN STRATA	A ARE INFERRE	ED		1	2	! ;	3 4	5	D %
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ОЕРТН (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLE NUMBER	ENGTH (IN.)	RQD (%)	MOISTURE	UNIFIED SOIL CLASS.		M	ATERIAL			LITHOLOGY*	•	DENET	STAN	DARD	9/ET \	
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	_							PROJECT N	o. 1210	5.01			В	OR	INC	3 N	0. (GR-	4		
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								LOCATION:	Gosh	nen, NY							SH	IEET I	No. 1 c	of 1	
CLIE	NT: K	G+D Arc	hitect	s, PC					9 ~	DATE		TIME	DE	PTH	INSF	PECTO	R: D	rew B	ugna		
CON	ITRACT	OR: Lir	nited /	Access	Drilli r	ng Se	rvices,	LLC	GROUND						DRII	LER:	Z	ack Bo	oland		
METH	OD OF A	ADVANCIN	IG BOR	RING	DIA.		DE	EPTH	R ≥						SUR	FACE	ELEVA [.]	TION:	4	199.0	
POV	VER AU	GER:			3 1/4"	'	0	TO 20'	MON. \	WELL	□ \	YES	X	NO	DAT	UM:	;	See Re	emarks	8	
ROT	. DRILL	:						то	SCREE	EN DEPTH:		ТО			DAT	E STAF	RT:	7/27/	/23		
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DIA	MOND C	ORE:						ТО	DEPTH	TO ROCK:	Not	Encounter	red'		UNC	CONFINE		IPRESS IS/FT)	. STREN	GTH	
Acke	r Recor	Track Rig	with A			er		ı	*CHAN	IGES IN STRA	ATA AF	RE INFERRE	:D			1	2	3	4 !	5 	ELEVATION (FT.)
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ОЕРТН (FT.)	N OR MIN./FT	PENETRATION RESISTANCE (BL/6 IN.)	H H H H	REC	OV.	URE	UNIFIED SOIL CLASS.		DL	OF OF				LITHOLOGY*		← − − 0 2	-	8— — · 30		-∆ 50	VAT
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20																	<u></u>				_479.0
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REM	IARKS:	Surfac	e elev	ations	estima	ted b	ased o	n a survey pr	ovided b	y KG+D Arc	chitec	ts, PC, dra	wing2	23009	5, dat	ed Au	gust 2	, 2023	3.		

								PROJECT No	o. 12105	.01		В	OR	INC	3 N	0. (GR-	5		
		C		71	1Ĭ			PROJECT:	OUBC	CES Gibsor	Road	_	J. \		•	-· `		-		
								LOCATION:	Gosh	en, NY						SH	IEET I	No. 1 c	of 1	
CLIE	NT: K	G+D Arc	hitect	s, PC					S 8.	DATE	TIME	DEF	PTH	INSF	PECTO	R: E	loge N	ldja		
CON	TRACT	OR: Lin	nited A	Access	Drillin	ng Se	rvices,	LLC	GROUND					DRIL	LER:	R	yan S	oles		
ИЕТНО	D OF A	DVANCIN	IG BOR	RING	DIA.		DE	EPTH	ე >					SUR	FACE E	ELEVA	TION:	4	199.0	
POW	ER AU	GER:			3 1/4"	•	0	TO 10'	MON. V	/ELL	YES	X 1	10	DAT	UM:		See Re	emarks	S	
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CLIENT: KCCCONTRACTOC ETHOD OF AID POWER AUG ROT. DRILL: CASING: DIAMOND CCCAcker Recon	G+D Arc DR: Lin DVANCIN BER:	chitec mited	ts, PC		C		PROJECT: LOCATION:		OCES Gibson en, NY	Road				SE	IEET N	lo 1 o	f 1	
CLIENT: KC CONTRACTO ETHOD OF AI POWER AUG ROT. DRILL: CASING: DIAMOND CO Acker Recon	G+D Arc DR: Lin DVANCIN BER:	chitec mited	ts, PC				LOCATION:	Gosh	en, NY					SH	IFFT N	lo 1 o	f 1	
CONTRACTO ETHOD OF AI POWER AUG ROT. DRILL: CASING: DIAMOND CO Acker Recon	DR: Lin DVANCIN BER:	mited													<u> </u>			
POWER AUG ROT. DRILL: CASING: DIAMOND CO	DVANCIN GER:		Access					2 K	DATE	TIME	DEPTH	INSI	PECTOR	R: E	loge N	dja		
POWER AUG ROT. DRILL: CASING: DIAMOND CO	SER:	NG BOI		s Drillin	ng Se	ervices,	LLC	GROUND				DRII	LLER:	R	yan So	les		
ROT. DRILL: CASING: DIAMOND CO			RING	DIA.		DE	PTH	₽ ×				SUF	RFACE E	ELEVA	ΓΙΟΝ:	4	99.0	
CASING: DIAMOND CO	ORE:			3 1/4'	•	0	TO 10'	MON. V	VELL [YES	X NO	DAT	UM:		See Re	marks	;	
DIAMOND CO	ORE:						то	SCREE	N DEPTH:	ТО		DAT	E STAF	RT:	7/27/2	23		
Acker Recon	ORE:						то	WEATH	HER: Clear	TEMP:	80° F		E FINIS		7/29/2			
							то	DEPTH	TO ROCK:	Not Encounte	red'	UNG	CONFINE		PRESS. S/FT)	STREN	STH	
	Track Rig	g with A	Automati	c Hamm	ner			*CHAN	GES IN STRATA	A ARE INFERRE	D		1 2	2	3 4	5	i	
.: <u> </u> :	N H		SAMI			· vi		DE	SCRIPTIO	NI.	*		STIC	WA CONT	TER ENT %	LIQI LIMI	JID T %	
DEPTH (FT.)	PENETRATION RESISTANCE (BL/6 IN.)) !! !!	REC		JRE	UNIFIED SOIL CLASS.		DE	OF	N	LITHOLOGY*		≻ — —	- — — 10 3	⊗— — — 60 40	- — — ₂ 0 50		
EPT OR N	NET ESIS (BL/	SAMPLE	ENGTH (IN.)	RQD (%)	MOISTURE			I/	IATERIAL		운		1	STAN	l I DARD	+		
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1 4	2 2		19				1	-	nt, 2" gravel		🟻	8						
2 4	2 1	- S-1	12		М	SM	BWn c-i SA	AND, IIII	e c-i Gravei,	little Silt (FIL	.L) 🛞	\						
	5																	_
3 - 27	12 _ 15	S-2	20		М	ML	Bwn SILT,	and c-f	Sand, little c	-f Gravel								-
4	26 12	+										1						-
5 - 75	60 15	S-3	17		М	SM	Bwn-gy c-f	Sand, a	and Silt, little	f Gravel								49
6	34 5											.] 						L
7 - 72	25 47	- S-4	11		М	ML	Bwn SILT,	some c	-f Sand, little	c-f Gravel							7	2
88	39	_																
9 14	5 7 _	- S-5	3		М	ML	Same											
10	7 24					IVIL	Came											_48
44	5 5																	
	10 45	- S-6	4		М	SM	Bwn c-t SA	AND, soi	me c-f Grave	I, little Silt			•					Г
12									-f D - win t 4	101	1.1.1							_
13 _	-	1						Ena	of Boring at 1	12								r
14	-	1																-
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T_4		C	1	71	1i			PROJECT:	OUB	OCES Gibso	n Road		O .,		J . (O. ·	J 1 \	•		
						U		LOCATION:	Gost	nen, NY						SH	IEET I	No. 1 c	of 1	
CLIENT:	KG	S+D Arc	hitect	s, PC				1	9 4	DATE	TIME	DE	PTH	INSF	PECTO	R: A	nthon	y Schv	vind	
CONTRA	СТО	R: Lin	nited /	Access	Drillin	ng Se	rvices,	LLC	GROUND					DRIL	LER:	R	yan S	oles		
ETHOD C	OF AE	OVANCIN	IG BOR	ING	DIA.		DE	EPTH	R ≥					SUR	FACE	ELEVA	TION:	4	99.0	
POWER	AUG	ER:			3 1/4"	•	0	TO 20'	MON. \	WELL [YES	X	NO	DAT	UM:	;	See Re	emarks	3	
ROT. DR	RILL:							то	SCREE	N DEPTH:	TO			DAT	E STAF	RT:	7/29/	23		
CASING:								ТО	WEATI	HER: Clear	TEMF	⊃: 75 °	F		E FINIS		7/29/			
DIAMONI	D CC	RE:					•	ТО	DEPTH	TO ROCK:	Not Encount	ered'		UNC	ONFINE		IPRESS. IS/FT)	STREN	GTH	
Acker Re	con 7	Track Rig	with A			er	1	1	*CHAN	GES IN STRAT	A ARE INFERR	ED			1 :	2	3	4 5	5	ELEVATION (FT.)
<u>.</u> F	-	CE ON		SAME			SS.		DF	SCRIPTIO	N		* 2		STIC IT %	WA CONT	TER ENT %	LIQ LIMI	T %	N
DEPTH (FT.)	יאווא	IRAT STAN /6 IN.	2 ER	REC	OV.	URE	UNIFIED OIL CLAS			OF			200	1	← — - ρ 2	20 3	8— — - 30	io 5	∆ 0	
DEPTH (FT.)		PENETRATION RESISTANCE (BL/6 IN.)	SAMPLE NUMBER	ENGTH (IN.)	RQD (%)	MOISTURE	UNIFIED SOIL CLASS.		N	IATERIAL			LITHOLOGY*	•	DEVIC.	STAN	IDARD	VO/ET \		"
	<u> </u>		0, 2	LEI	ш -	Š	"	4" T					<u> </u>	1			N (BLOV 30 4	VS/FT.) I0 5	0	
1 - 32	,	31 14 _	S-1	10		М	SM	4" Topsoil- Bwn m-f S			:-f Gravel (FI	111								L
2	_	18 20	J-1	10			Sivi		., u 1□, ai	ia oni, nue (, Clavel (I I	/	\bigotimes			/				
		9	6.5					D		- 40 3 -1999										[
4 14	4	6 60	S-2	14		M	ML	BWN SILI,	, some r	n-f Sand, littl	e c-ī Gravel									
		18 23						-												
5 - 48	8	25	S-3	22		M	ML	Bwn SILT,	, some c	-f Gravel, tra	ice m-f Sand	ı							= /	_494.0
6		61 34						_												t.
7 - 11	11	55 _ 56	S-4	18		М	SM	Bwn m-f S	SAND, a	nd Silt, trace	c-f Gravel								17	11
8	\dashv	44 14			+															-
9 - 43	3	25 _ 18	S-5	6		W	ML	Gy-bwn SI	ILT, little	f Gravel, litt	le m-f Sand							•		-
10		15						_										 /		489.0
11		_															,			L
12_		_															/			L
13 _		_															/			
14																				
15																	/			484.0
40		7 19											K							_404.0
16 30	0	11 12	S-6	16		W	GM	Gy c-f GR	AVEL, s	ome Silt, littl	e m-f Sand		拟			/				ļ
17		12_						-								/				†
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21 - 12	2	5 7	S-7	22		W	CL	Gy SILTY	CLAY						•					-
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						. 7		PROJECT N	o. 1210	5.01		BOI	RING	G N	0. (GR-	8		
		C		71	1			PROJECT:	OUB	OCES Gibso	n Road		~~ ~ ~ ~ ~	•	-· \		•		
								LOCATION:	Gosh	en, NY					SH	IEET N	No. 1 o	of 1	
CLIE	NT: K	G+D Arc	hitect	s, PC				1	9 ~	DATE	TIME	DEPTH	INS	PECTO	R: A	nthony	y Schw	vind	
CON	TRACT	OR: Lir	nited /	Access	s Drilli	ng Se	ervices,	LLC	GROUND				DRI	LLER:	R	yan So	oles		
ИЕТНО	D OF A	ADVANCIN	IG BOR	RING	DIA.		DE	EPTH	R >				SUF	RFACE I	ELEVA	TION:	4	199.0	
POW	ER AU	GER:			3 1/4		0	TO 5.5'	MON. V	WELL	YES	X NO	DAT	UM:	5	See Re	emarks	8	
ROT.	DRILL	:						то	SCREE	N DEPTH:	ТО		DAT	E STAF	RT:	7/31/	23		
CASI	NG:							ТО	WEATH	HER: Clear	TEMP	70° F		E FINIS		7/31/			
DIAM	OND C	ORE:						ТО	DEPTH	TO ROCK:	Not Encounte	red'	UN	CONFINE		IPRESS. IS/FT)	STREN	GTH	
Acker	Recon	Track Rig	with A			ner		ı	*CHAN	GES IN STRAT	A ARE INFERRE	D		1 :	2	3 4	4 5	5 	F.
<u>.</u>	Ħ.	S B ○		SAME					DE	SCRIPTIC	N	*		STIC	WA CONT	TER ENT %	LIQI LIMI		NO.
H (F)	N.N.	TAN TAN 6 IN	필띪	REC	OV.	JRE	UNIFIED OIL CLAS		DL.	OF	IN.			≻−− 10 2	0 3	⊗— — - 30 4		-∆ 50	VAT
ОЕРТН (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLE NUMBER	ENGTH (IN.)	RQD (%)	MOISTURE	UNIFIED SOIL CLASS.		M	1ATERIAL		LITHOLOGY*		1	STAN	IDARD	1	1	ELEVATION (FT.)
٦	z	照 ~	ωŽ		۳)	ĭ	S								FRATIO	N (BLOW		60	
1		1 2	C 4	10		N.4	CM4	4" Topsoil- Topsoil	like mat	terial		$\stackrel{3}{\swarrow}$	\ \ \ -						
2	- 9	7	S-1	10		М	SM	Gy-bwn c- (FILL)	f Sand, a	and c-f Grav	el, little Silt								
		10						` ′											<u> </u>
3	- 29	16	S-2	10		М	SM	Bwn m-f S	AND, so	ome Silt, trad	e c-f Gravel				1				<u> </u>
4		26 10						Bwn-rd c-f	GRAVF	EL, little c-f S	and, trace Si	lt Fig.							-
5	104	49 55	S-3	4		М	GP	Auger refu	isal enco	ountered at 6 to boring G	feet,boring							1	494.0
6		60						onset to te	eet west	to borning G	N-0A	,•							-
7	-	-							End	of Boring at	6'								-
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9																			
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	•																		
27 REM	ARKS:	Surfac	و واور	ations	estima	ated k	nased o	n a survey pr	ovided by	v KG+D Arch	itects, PC, dra	awing2300	 95_dat	ed Au	nuet 2	2023 			<u> </u>
			. 5.01					Pi		, = 7,101	, . o , are		,		, - - ;	, _5_5.			

				71	Ai			PROJECT:	OUBC	OCES Gibsor	n Road							8A		
		C				U		LOCATION:	Gosh	en, NY						SH	IEET N	 lo. 1 o	f 1	
LIEI	NT: K	G+D Arc	hitect	s, PC				1	9 %	DATE	TIME	DE	PTH	INSF	ECTO		nthony			
ON	TRACT	OR: Lir	nited A	Access	s Drilli	ng Se	ervices,	LLC	GROUND					DRIL	LER:	R	yan So	les		
THC	DD OF A	ADVANCIN	IG BOR	RING	DIA.		DE	EPTH	GR ×					SUR	FACE E	ELEVA	īION:	4	99.0	
OW	ER AU	GER:			3 1/4		0	TO 20'	MON. W	/ELL [YES	X	NO	DAT	UM:		See Rei	marks	i	
OT.	DRILL:							то	SCREE	N DEPTH:	ТО			DAT	E STAF	RT:	7/31/2	23		
ASI	NG:							то	WEATH	ER: Clear	TEM	P: 70 °	F	DAT	E FINIS	SH:	7/31/2	23		
IAM	OND C	ORE:						то	DEPTH	TO ROCK:	Not Encount	ered'		UNC	ONFINE		PRESS. S S/FT)	STRENC	STH	
cke	Recon	Track Rig	with A	utomati	c Hamr	ner			*CHANG	GES IN STRAT	A ARE INFERR	ED			1 2	2 ;	3 4	. 5	i	
·	ŀ.	N H		SAMI			· vi		DEG	SCRIPTIO	NI.		*	PLA: LIM	STIC	WA CONT	TER ENT %	LIQU LIMI	JID T %	
	OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	쁘监	REC	OV.	JRE	UNIFIED SOIL CLASS.		DE	OF	IN		LITHOLOGY*		← — — 0 2	- — — 0 3	⊗— — — 60 40	<u>/</u> 2		
DEPTH (FT.)	OR	ESIS (BL/	SAMPLE NUMBER	ENGTH (IN.)	RQD (%)	MOISTURE	IN O		М	ATERIAL			THO			STAN	DARD	1		
١	z	吊조	ωz	LEN (II	<u>د</u> ت	ĕ	S							1			N (BLOW:)	
1								Boring GR	-8A offse	et 10 feet we	est of boring									
2								GR-8. Drill feet. No S	led throu	gh overburd	en soils to 4									Ī
	-	-						1551. 140 0	oamp	' y										
3	-	-																		
4	1:00							1					000							
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6	-	-	C-1	4	6.7			Carad thre	مط مطعيي	مراطمة الممارين	an 1 and 0 f	in at	000							ŀ
7	:27	-	C-1	4	6.7			Corea inic	ougn a bo	oulder betwe	en 4 and 9 i		000							L
8	:22	-											000							-
9	:40	_						_					000							F
10													0 0 0							_48
11	- 20	7 10 _	S-1	12		М	SM	Gv c-f SAN	ND. some	e c-f Gravel,	some Silt									L
12		10 12						, , , , , , ,	,											
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15 _	-	10						1												_48
16	- 12	5 7	S-2	10		М	SM	Gy c-f SAI	ND, and	Silt, trace c-	f Gravel				•					
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21	- 15	8 -	S-3	10		W	SM	Same												-
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24	_	_								-										
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		_					PROJECT No				BOI	RING	G N	0. (3R-9	•	
T	C	te	71	1			PROJECT:	OUB	OCES Gibsor	n Road							
							LOCATION:	Gosh	en, NY					SF	IEET N	lo. 1 of	1
CLIENT:	KG+D Ar	chitect	s, PC					S K	DATE	TIME	DEPTH	INS	PECTO	R: D	rew Bu	gna	
CONTRAC	TOR: Li	mited /	Access	s Drillin	ng Se	rvices,	LLC	GROUND				DRI	ILLER:	Z	ack Bo	land	
ETHOD OF	ADVANCI	NG BOR	RING	DIA.	\perp	DE	EPTH	ъ ×				SUF	RFACE I	ELEVA	ΓΙΟΝ:	499	9.0
POWER A	JGER:			3 1/4'	·	0	TO 20'	MON. V	VELL [YES	X NO	DAT	TUM:		See Rei	marks	
ROT. DRIL	L:					-	ТО	SCREE	N DEPTH:	 TO		DAT	TE STAF	RT:	7/27/2	23	
CASING:				↓	\perp		то	WEATH	IER: Overc	ast TEMP	79° F		TE FINIS		7/27/2		
DIAMOND	CORE:				\perp	-	ТО	DEPTH	TO ROCK:	Not Encounte	red'	UNG	CONFINE		IPRESS. S IS/FT)	STRENGT	
Acker Reco		1			ier	1		*CHAN	GES IN STRAT	A ARE INFERRE	ED		1 :	2	3 4	5	D %
. Ť	PENETRATION RESISTANCE (BL/6 IN.)		SAME			SS.		DES	SCRIPTIO	N	*	LIM	ASTIC MIT %		TER ENT %	LIQUII LIMIT (D %
DEPTH (FT.)	TRAT STAN 16 IN	유	REC		MOISTURE	UNIFIED SOIL CLASS.		52.	OF	. •	LITHOLOGY*		×	— — — 2 _, 0 3	8— — — 30 40	50 50	
DEP1	ENE SESIS	SAMPLE	ENGTH (IN.)	RQD (%)	OIST	NN		M	IATERIAL		<u>F</u>		DENE	STAN	IDARD	PO/ET \	
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1_ 84+	23 34	S-1	8		М	SP	2" Asphalt	paveme	ent, 2" gravel	subbase vel, trace Silt							84 —
2	50/5						trace brick		mue c-i Gla	vei, ii aut Olli	, <u> </u>	\preceq					
	8 7	0.0	40			C1.4	Dum == £0	AND -	mo Cilt Iitti	o f Crarrel						_	
	6 7	S-2	18		М	SM	Bwn m-t S	AND, SC	me Silt, little	e c-i Gravel							
4	7 8						_		_	_			\				ļ.,
5 - 16	8	S-3	12		М	SM	Bwn c-f SA	AND, soi	me Silt, som	e c-f Gravel		· 	ļ .				49
6	8 4																-
7 - 15	5 10	S-4	16		М	SM	Bwn m-f S	AND, ar	nd Silt, little o	c-f Gravel							-
8	10 12				—												-
9 - 32	16 16	S-5	14		М	SM	Bwn m-f S	AND, so	me c-f Grav	el, little Silt					 		-
10	16											:]					48
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17	14	S-6	13		М	SM	Gy m-f SA	שט, and	Silt, little c-f	Gravel					′		
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21 - 13	6 7	S-7	10		М	SM	Same						•				-
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1		C			ni			PROJECT:	OUB	OCES (Gibson	Road	╛	- - 1 ·		1	J. \	~· \	. •		
								LOCATION:	Gos	hen, NY	•						SH	HEET N	No. 1 c	of 1	
CLIE	NT: K	G+D Arc	hitect	ts, PC					9 K	DA	TE	TIME	DE	PTH	INSF	PECTO	R: C	onnor	McCle	eary	
CON	TRACT	OR: Co	re Do	wn Dri	lling L	LC			GROUND						DRII	LLER:	K	evin N	lash		
METHO	D OF	ADVANCIN	IG BOF	RING	DIA.			EPTH	_						SUR	RFACE I	ELEVA	ΓΙΟΝ:	4	499.0	
	ER AU					-		ТО	MON.			YES	X	NO		UM:		See Re		S	
	DRILL	:				-		TO		EN DEPT		ТО				E STAF		7/6/2			
CASII						-		TO	WEAT		Clear		P: 75	° F		CONFINE		7/6/2 IPRESS.			
	OND C			4		4:		ТО		H TO ROO		Not Encount			-	•		IS/FT)		· · · ·	
Geop	robe 6	712DT trad			PLES	tomati	c namme	er 	"CHAN	NGES IN S	SIKAIA	A ARE INFERR	ED		DLA	1 :	2	3 +	 	5 	ELEVATION (FT.)
Ű.	/FT.	PENETRATION RESISTANCE (BL/6 IN.)		DEC	COV.	111	D.		DE	SCRI	OIT	N		LITHOLOGY*	LIM	STIC IIT % — —	CONT	TER ENT % ⊗— — -		QUID IIT % - ∆	Ó
DEPTH (FT.)	OR MIN./FT.	TRA ISTA L/6 IN	SAMPLE NUMBER			MOISTURE	UNIFIED SOIL CLASS.			OF				OLC	1 '	10 2	20 3	30 4		50	EVA
当	N PO	PENE RES (B	SAN	ENGTH (IN.)	RQD (%)	MOIS			N	MATEF	RIAL			<u>=</u>	•	PENE	STAN TRATIO	IDARD N (BLOV	VS/FT.)		=
		 		-		_		3" asphalt	paveme	ent. 3" c	ravel :	subbase			1				10 5	50	1
1		7 5		l				Bwn-gy SI	-	_	_			\bigotimes							-
2	9	4 -	S-1	24		М	ML	(FILL)	,		,			\bowtie			_				-
3	50+	50/4	S-2	3		М	ML	Same Boring terr	minated	l on spli	t-spoo	n refusal	_	\bowtie							-
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LEGEND FOR SOIL DESCRIPTION

COARSE GRAINED SOIL	(Coarser then No. 200 Sieve)	

DESCRIPTIVE TERM & GRAIN SIZE

 TERM
 SAND
 GRAVEL

 coarse - c
 No. 4 Sieve to No. 10 Sieve
 3" to 3/4"

 medium - m
 No. 10 Sieve to No. 40 Sieve
 3/4" to 3/16"

fine - f No, 40 Sieve to No. 200 Sieve

COBBLES 3" to 10" BOULDERS 10" +

GRADATION DESIGNATIONS PROPORTIONS OF COMPONENT

fine, f
Less than 10% coarse to medium medium to fine, m-f
Less than 10% coarse

medium, m Less than 10% coarse and fine

coarse to medium, c-m Less than 10% fine

coarse, c Less than 10% medium and fine

coarse to fine, c-f All greater than 10%

FINE GRAINED SOIL (Finer than No. 200 Sieve)

<u>DESCRIPTION</u>	PLASTICITY INDEX	<u>PLASTICITY</u>
Silt	0 - 1	none
Clayey Silt	2 - 5	slight
Silt & Clay	6 - 10	low
Clay & Silt	11 - 20	medium
Silty Clay	21 - 40	high
Clay	greater than 40	very high

PROPORTION

DESCRIPTIVE TERM PERCENT OF SAMPLE WEIGHT

trace 1 - 10 little 10 - 20 some 20 - 35 and 35 - 50

The primary component is fully capitalized if >50% of sample

COLOR

Blue - blue Gy - gray Wh - white
Blk - black Or - orange Yl - yellow
Bwn - brown Rd - red Lgt - light
Gn - green Tn - tan Dk - dark

SAMPLE NOTATION

S - Split Spoon Soil Sample WOC - Weight of Casing
U - Undisturbed Tube Sample WOR - Weight of Rods
C - Core Sample WOH - Weight of Hammer

B - Bulk Soil Sample PPR - Compressive Strength based on

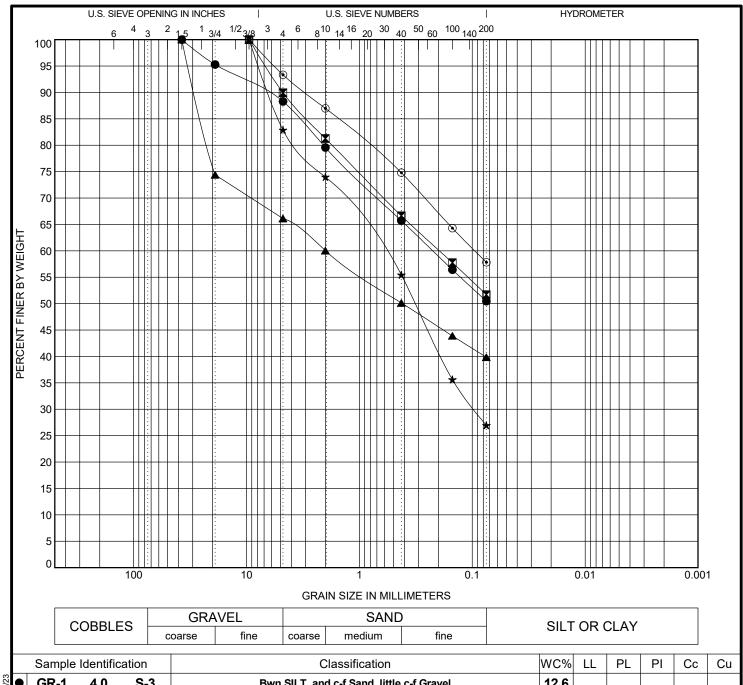
NR - No Recovery of Sample Pocket Penetrometer

TV - Shear Strength (tsf) based on Torvane

ADDITIONAL CLASSIFICATIONS

New York City Building Code soil classifications are given in parentheses at the end of each description of material, if applicable. See sections 1804.2 of the 2008 Building Code for further details.





		Sample	dentific	ation				Clas	sification		M	VC%	LL	PL	PI	Сс	Cu	
T 9/25/23	•	GR-1	4.0	S-3			Bwn SIL	T, and c-	f Sand, little	c-f Gravel		1	12.6					
T 9/2	×	GR-10	0.0	S-1			Bwn-Gy S	SILT, and	l c-f Sand, li	ttle f Gravel		1	11.5					
G.GD	▲	GR-2	2.0	S-2			Gy Silt, s	some c-f	Gravel, som		8.2							
C EN	*	GR-3	0.0	S-1		Gy c-f SAND, some Silt, little f Gravel												
TECTONIC ENG.GDT	•	GR-5	2.0	S-2		Bwn SILT, and c-f Sand, trace f Gravel												
TEC		Sample	dentific	ation	D100 D60 D30 D10 %Gravel %Sand %Silt %						%Cla	ay		Source	of Ma	aterial		
GPJ	•	GR-1	4.0	S-3	37.5	0.224			11.7	37.8	50).5			В	Boring	l	
SON	×	GR-10	0.0	S-1	9.5	0.195			10.1	38.2	51	1.7			В	Boring	l	
1GIE	A	GR-2	2.0	S-2	37.5	1.991			33.9	26.3	39.8				В	Boring	l	
12105.01GIBSON.GPJ	*	GR-3	0.0	S-1	9.5	0.622	0.096		17.1	55.9	27.0				В	Boring	l	
N 12	•	GR-5	2.0	S-2	9.5	0.095			6.7	35.5	57.8				В	Boring	l	

Tectonic⁷

280 Little Britain Road, Bldg. 2 Newburgh, NY 12550

Telephone: (845) 563-9081

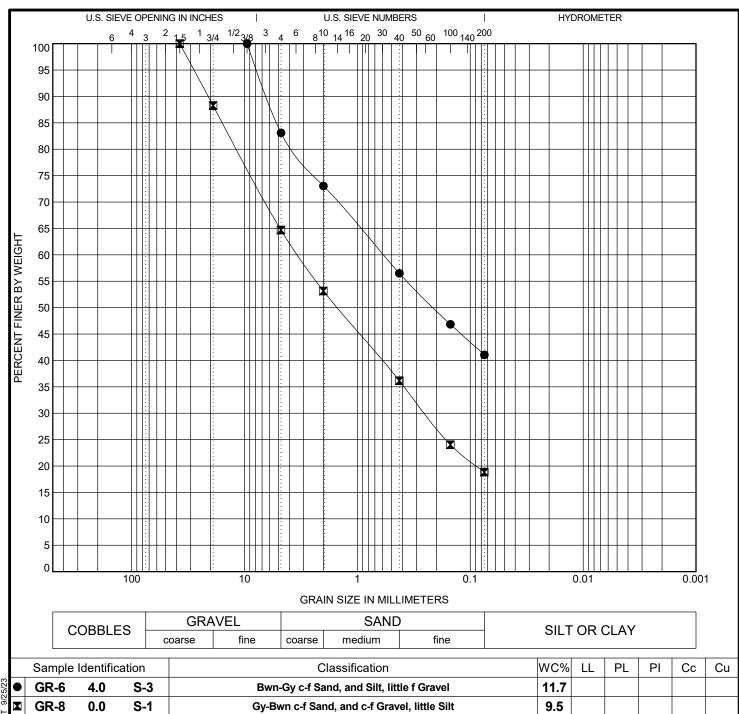
Fax: (845) 563-9085

GRAIN SIZE DISTRIBUTION

Project No: **12105.01** Date: **9/25/23**

Project: OUBOCES - Gibson Rd.

Location: Goshen, NY



	Campio	140111111	Juli 011				0.40	JOOG (1	•				110 70				- 00	
•	GR-6	4.0	S-3			Bwn-Gy	c-f Sand	, and Si	lt, littl	e f Gravel			11.7					
×	GR-8	0.0	S-1		(Gy-Bwn c	-f Sand,	and c-f	Grave	el, little Silt	:		9.5					
Н	Sample	Identific	cation	D100	D60	D30	D10	%Gra	ivel	%Sand	%Silt	%C	lav		Source	e of Ma	 aterial	
•	GR-6	4.0	S-3	9.5	0.59	200	D 10	16.9	-	42.0		1.1	, ay			Boring		
×	+			37.5	3.342	0.251		35.	3	45.8	18	8.8			E	Boring	 J	
Tectonic ⁷										G	RAIN S	SIZE	E DIS	STR	IBU'		I	
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	elephon		081	63-908	35	Loca	ation: G o	oshen, N	Y									

Tectonic⁷

GRAIN SIZE DISTRIBUTION



MOUNTAINVILLE, NY (CORPORATE OFFICE)

70 Pleasant Hill Road, PO Box 37 Mountainville, NY, 10953 Phone: 845-534-5959 Fax: 845-534-59993

(Name of Bidder)

BID FORM

FOR

ORANGE ULSTER BOCES

ADDITIONS & ALTERATIONS TO EMANUEL AXELROD SPECIAL EDUCATION CENTER

CONTRACT NO. 1 – GENERAL CONSTRUCTION WORK

Owner Information: Orange Ulster BOCES 53 Gibson Road Goshen, New York 10924

Attn: Mark Coleman, Assistant Superintendent for Finance & Management

Project Location:
Orange Ulster BOCES – Gibson Road Campus
Emanuel Axelrod Education Center
53 Gibson Road
Goshen, New York 10924

- 1. The Undersigned hereby declares that it has carefully examined all Bidding and Contract Documents and has inspected the actual location of Work, together with the local sources of supply, and has satisfied itself as to all quantities and conditions, and understands that in signing this Proposal, it waives all rights to plead any misunderstanding regarding the same.
- 2. The Undersigned further understands and agrees that it is to do, perform and complete all the Work in accordance with the Contract Documents and Contract and to accept in full compensation therefor, the amount of the Base Bid, modified by such additive or deductive alternatives, if any, as are accepted by the Owner.
- 3. In submitting this Bid, the Undersigned agrees:
 - a. To hold the Bid open for forty-five (45) days after Bid Opening.
 - b. To accept the provisions of the Instructions to Bidders.
 - c. To enter into and execute a Contract and the PLA within ten (10) days of the Notice of Award issue date, and to simultaneously furnish Performance and Labor and Material Bonds.
 - d. To enter into, become signatory to, and to abide by, the provisions of the Project Labor Agreement with the Hudson Valley Building and Construction Trades Council, AFLCIO and the signatory local unions. A copy of this Project Labor Agreement ("PLA") is included in the specifications as Section 007013.
 - e. To require any and all of its subcontractors of any tier on the Orange Ulster BOCES Additions and Alterations to Emanuel Axelrod Education Building Project to become signatory to, and to abide by, the PLA.
 - f. To commence the Work immediately upon receipt of Notice of Award.
- 4. The Undersigned agrees to the stated percentages for Changes in the Work in accordance with Invitation/Instructions to Bidders and Article 7 AIA 232-2019
- 5. The Undersigned agrees that the Work proposed herein will be Substantially Complete the dates indicated in specification Section 011000 "Summary" and in the Project Milestone Schedule following Section 011000.

- 6. By submission of this Bid, each Bidder and each person signing on behalf of any Bidder certifies, and in the case of a joint Bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of the party's knowledge and belief:
 - a. the prices in this Bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices, with any other Bidder or with any competitor,
 - b. unless otherwise required by law, the prices that 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
 - c. 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.

A Bid shall not be considered for award, nor shall any award be made where a., b., and c. above have not been complied with, provided however, that if in any case the Bidder cannot make the foregoing certification, the Bidder shall so state and shall furnish, with the Bid, a signed statement which sets forth in detail the reasons therefor. Where a., b., and c. 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 a Bidder (a) has published price lists, rates or tariffs covering items being procured, (b) has informed prospective customers of proposed or pending publication of new or revised price 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 this Section.

- 7. The Undersigned understands that the Owner reserves the right to accept or reject any or all Bids and to waive any informalities in the bidding.
- 8. The Undersigned acknowledges the receipt of the following addenda, but agrees that it is bound by all addenda whether or not listed herein:

Addendum Number	Date of Addendum

		(Name of Bidder)
9.	BASE BID	
	All labor, material, services and equipment on the Drawings and the Technical Specific CONSTRUCTION WORK:	necessary for completion of the Work shown cations for Contract No. 1 GENERAL
	\$	(in numbers)
		Dollars (in words)
10.	ALTERNATES	
		rk in accordance with the requirements of the ion 012300 "Alternates" and includes all costs ustments for the following:
1.	ADD ALTERNATE NO.1: EXTERIOR V	/INDOWS
	ADD	Dollars (\$)
2 <i>P</i>	A. ADD ALTERNATE NO.2A: GROUND F	LOOR CLASSROOMS PART A
	ADD	Dollars (\$)
2E	3. ADD ALTERNATE NO.2B: GROUND F	LOOR CLASSROOMS PART B
	ADD	Dollars (\$)
20	C. ADD ALTERNATE NO.2C: GROUND F	LOOR CLASSROOMS PART C
	ADD	Dollars (\$)

3.	ADD ALTERNATE NO.3: RENOVATION OF EXISTING POOL AND ADJ. SPACES					
	ADD	Dollars (\$)				
4. ADD ALTERNATE NO.4: EXTERIOR PLAZA / COURTYARD						
	ADD	Dollars (\$)				

(Name of Bidder)

11. SCHEDULE OF UNIT PRICES

CONTRACT NO. 1 – GENERAL CONSTRUCTION WORK

The Undersigned agrees to perform all work as drawn and specified for the following items at the unit prices given. See Section 012200 "Unit Prices" for further information.

Unit Price GC-1 – Removal and Reinstallation of ACT Ceilings	\$/Sq. Ft
Unit Price GC-2 – New Chase Wall	\$/Sq. Ft
Unit Price GC-3 – Rock Removal	\$/Cub. Yd
Unit Price GC-4 – Unsuitable Soils	\$/Cub. Yd

- **12.** The Undersigned has attached the following documents to this Bid:
 - A. 004100 Non-Collusive Affidavit
 - B. 004200 Indemnification and Hold-Harmless Clause
 - C. 004300 Certificate of Compliance with the Iran Divestment Act
 - D. 004400 Sexual Harassment Written Policy and Training Certification
 - E. 004500 Bid Bond / Certified Check
 - F. 004600, 004601, 004602, 004603, 0046004 Statement of Bidder's Qualifications AIA Document A305 and Exhibits A, B, C, and D

(BID FORM CONTINUES NEXT PAGE)

				(Name of Bidder
Legal name of person, partnership, joint venture or	corporation (please	type)		(If Corporation, affix corporate seal)
Address (please type)				
Federal ID No. or Social Security No.	(please type)			
Phone No. (please type)				
Name and title of signer (please type)			
Signature			Date	
If a Corporation Name			Address	
	_ , PRESIDEN	Т		
	_ , SECRETAR	RY		
	_ , TREASURE	ER		
If a Partnership Name	_	Address		
	_			
If a Joint Venture Name	_	Address		

		(Name of Bidder)
If an Individual Name of Individual	Address	

See Specifications Sections 004100, 004200, 004300, 004400, 004500, 004600, 004601, 004602, 004603, and 004604 for additional forms to be included with bid proposal.

END OF BID FORM

(Name of Bidder)

BID FORM

FOR

ORANGE ULSTER BOCES

ADDITIONS & ALTERATIONS TO EMANUEL AXELROD SPECIAL EDUCATION CENTER

CONTRACT NO. 2 – ABATEMENT WORK

Owner Information: Orange Ulster BOCES 53 Gibson Road Goshen, New York 10924

Attn: Mark Coleman, Assistant Superintendent for Finance & Management

Project Location:
Orange Ulster BOCES – Gibson Road Campus
Emanuel Axelrod Education Center
53 Gibson Road
Goshen, New York 10924

- 1. The Undersigned hereby declares that it has carefully examined all Bidding and Contract Documents and has inspected the actual location of Work, together with the local sources of supply, and has satisfied itself as to all quantities and conditions, and understands that in signing this Proposal, it waives all rights to plead any misunderstanding regarding the same.
- 2. The Undersigned further understands and agrees that it is to do, perform and complete all the Work in accordance with the Contract Documents and Contract and to accept in full compensation therefor, the amount of the Base Bid, modified by such additive or deductive alternatives, if any, as are accepted by the Owner.
- 3. In submitting this Bid, the Undersigned agrees:
 - a. To hold the Bid open for forty-five (45) days after Bid Opening.
 - b. To accept the provisions of the Instructions to Bidders.
 - c. To enter into and execute a Contract and the PLA within ten (10) days of the Notice of Award issue date, and to simultaneously furnish Performance and Labor and Material Bonds.
 - d. To enter into, become signatory to, and to abide by, the provisions of the Project Labor Agreement with the Hudson Valley Building and Construction Trades Council, AFLCIO and the signatory local unions. A copy of this Project Labor Agreement ("PLA") is included in the specifications as Section 007013.
 - e. To require any and all of its subcontractors of any tier on the Orange Ulster BOCES Additions and Alterations to Emanuel Axelrod Education Building Project to become signatory to, and to abide by, the PLA.
 - f. To commence the Work immediately upon receipt of Notice of Award.
- 4. The Undersigned agrees to the stated percentages for Changes in the Work in accordance with Invitation/Instructions to Bidders and Article 7 AIA 232-2019
- 5. The Undersigned agrees that the Work proposed herein will be Substantially Complete the dates indicated in specification Section 011000 "Summary" and in the Project Milestone Schedule following Section 011000.

- 6. By submission of this Bid, each Bidder and each person signing on behalf of any Bidder certifies, and in the case of a joint Bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of the party's knowledge and belief:
 - a. the prices in this Bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices, with any other Bidder or with any competitor,
 - b. unless otherwise required by law, the prices that 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
 - c. 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.

A Bid shall not be considered for award, nor shall any award be made where a., b., and c. above have not been complied with, provided however, that if in any case the Bidder cannot make the foregoing certification, the Bidder shall so state and shall furnish, with the Bid, a signed statement which sets forth in detail the reasons therefor. Where a., b., and c. 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 a Bidder (a) has published price lists, rates or tariffs covering items being procured, (b) has informed prospective customers of proposed or pending publication of new or revised price 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 this Section.

- 7. The Undersigned understands that the Owner reserves the right to accept or reject any or all Bids and to waive any informalities in the bidding.
- 8. The Undersigned acknowledges the receipt of the following addenda, but agrees that it is bound by all addenda whether or not listed herein:

Addendum Number	Date of Addendum

			(Name of Bidder
9.		BASE BID	
		All labor, material, services and equipment necessary for c on the Drawings and the Technical Specifications for Contr WORK:	
		\$	(in numbers)
			Dollars (in words)
١٥.		ALTERNATES	
		The Undersigned agrees to provide all work in accordance Specifications and the Drawings, and Section 012300 "Alte of related coordination, modification, or adjustments for the	rnates" and includes all costs
	1.	ADD ALTERNATE NO.1: EXTERIOR WINDOWS	
		ADD	Dollars (\$)
	2A.	ADD ALTERNATE NO.2A: GROUND FLOOR CLASSR	OOMS PART A
		ADD	Dollars (\$)
	2B.	ADD ALTERNATE NO.2B: GROUND FLOOR CLASSR	OOMS PART B
		ADD	Dollars (\$)
	2C	. ADD ALTERNATE NO.2C: GROUND FLOOR CLASSR	OOMS PART C
		ADD	Dollars (\$)

		(Name of Blace)
3.	ADD ALTERNATE NO.3: RENOVATION OF EXISTING F	POOL AND ADJ. SPACES
	ADD	Dollars (\$)

11. SCHEDULE OF UNIT PRICES

CONTRACT NO. 2 - ABATEMENT WORK

The Undersigned agrees to perform all work as drawn and specified for the following items at the unit prices given. See Section 012200 "Unit Prices" for further information.

Unit Price HAZ-1 – Mudded Joint Fittings	\$/Each
Unit Price HAZ-2 – Pipe Insulation	\$/Lin. Ft
Unit Price HAZ-3 – ACT Ceiling Tiles	\$/Sq. Ft
Unit Price HAZ-4 – Floor Mastic	\$/Sq. Ft
Unit Price HAZ-5 – Exterior Caulking	\$/Lin. Ft

- **12.** The Undersigned has attached the following documents to this Bid:
 - A. 004100 Non-Collusive Affidavit
 - B. 004200 Indemnification and Hold-Harmless Clause
 - C. 004300 Certificate of Compliance with the Iran Divestment Act
 - D. 004400 Sexual Harassment Written Policy and Training Certification
 - E. 004500 Bid Bond / Certified Check
 - F. 004600, 004601, 004602, 004603, 0046004 Statement of Bidder's Qualifications AIA Document A305 and Exhibits A, B, C, and D

(BID FORM CONTINUES NEXT PAGE)

(Name of Ridder)

				(Name of Bidder)
Legal name of person, partnership, joint venture of	r corporation (please	type)		(If Corporation, affix corporate seal)
Address (please type)				
Federal ID No. or Social Security No	. (please type)			
Phone No. (please type)				
Name and title of signer (please type))			
Signature			Date	
If a Corporation Name			Address	
	_, PRESIDEN	Γ		
	_, SECRETAR	Y		
	_, TREASURE	R		
If a Partnership Name	<u> </u>	Address		
If a laint Vantura				
If a Joint Venture Name		Address		
	<u> </u>			

		(Name of Bidder)
If an Individual Name of Individual	Address	
	_	

See Specifications Sections 004100, 004200, 004300, 004400, 004500, 004600, 004601, 004602, 004603, and 004604 for additional forms to be included with bid proposal.

END OF BID FORM

BID FORM

FOR

ORANGE ULSTER BOCES

ADDITIONS & ALTERATIONS TO EMANUEL AXELROD SPECIAL EDUCATION CENTER

CONTRACT NO. 3 – ROOFING WORK

Owner Information: Orange Ulster BOCES 53 Gibson Road Goshen, New York 10924

Attn: Mark Coleman, Assistant Superintendent for Finance & Management

Project Location:
Orange Ulster BOCES – Gibson Road Campus
Emanuel Axelrod Education Center
53 Gibson Road
Goshen, New York 10924

- 1. The Undersigned hereby declares that it has carefully examined all Bidding and Contract Documents and has inspected the actual location of Work, together with the local sources of supply, and has satisfied itself as to all quantities and conditions, and understands that in signing this Proposal, it waives all rights to plead any misunderstanding regarding the same.
- 2. The Undersigned further understands and agrees that it is to do, perform and complete all the Work in accordance with the Contract Documents and Contract and to accept in full compensation therefor, the amount of the Base Bid, modified by such additive or deductive alternatives, if any, as are accepted by the Owner.
- 3. In submitting this Bid, the Undersigned agrees:
 - a. To hold the Bid open for forty-five (45) days after Bid Opening.
 - b. To accept the provisions of the Instructions to Bidders.
 - c. To enter into and execute a Contract and the PLA within ten (10) days of the Notice of Award issue date, and to simultaneously furnish Performance and Labor and Material Bonds.
 - d. To enter into, become signatory to, and to abide by, the provisions of the Project Labor Agreement with the Hudson Valley Building and Construction Trades Council, AFLCIO and the signatory local unions. A copy of this Project Labor Agreement ("PLA") is included in the specifications as Section 007013.
 - e. To require any and all of its subcontractors of any tier on the Orange Ulster BOCES Additions and Alterations to Emanuel Axelrod Education Building Project to become signatory to, and to abide by, the PLA.
 - f. To commence the Work immediately upon receipt of Notice of Award.
- 4. The Undersigned agrees to the stated percentages for Changes in the Work in accordance with Invitation/Instructions to Bidders and Article 7 AIA 232-2019
- 5. The Undersigned agrees that the Work proposed herein will be Substantially Complete the dates indicated in specification Section 011000 "Summary" and in the Project Milestone Schedule following Section 011000.

(Name	of Bidd	er)
-------	---------	-----

- 6. By submission of this Bid, each Bidder and each person signing on behalf of any Bidder certifies, and in the case of a joint Bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of the party's knowledge and belief:
 - the prices in this Bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices, with any other Bidder or with any competitor,
 - b. unless otherwise required by law, the prices that 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
 - c. 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.

A Bid shall not be considered for award, nor shall any award be made where a., b., and c. above have not been complied with, provided however, that if in any case the Bidder cannot make the foregoing certification, the Bidder shall so state and shall furnish, with the Bid, a signed statement which sets forth in detail the reasons therefor. Where a., b., and c. 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 a Bidder (a) has published price lists, rates or tariffs covering items being procured, (b) has informed prospective customers of proposed or pending publication of new or revised price 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 this Section.

- 7. The Undersigned understands that the Owner reserves the right to accept or reject any or all Bids and to waive any informalities in the bidding.
- 8. The Undersigned acknowledges the receipt of the following addenda, but agrees that it is bound by all addenda whether or not listed herein:

Addendum Number	Date of Addendum

9.	BASE BID	
	All labor, material, services and equipment necessary for completion on the Drawings and the Technical Specifications for Contract No. 3 F	
	\$	_(in numbers)
		_Dollars (in words)

10. ALTERNATES

NOT APPLICABLE

11. SCHEDULE OF UNIT PRICES

CONTRACT NO. 3 – ROOFING WORK

The Undersigned agrees to perform all work as drawn and specified for the following items at the unit prices given. See Section 012200 "Unit Prices" for further information.

Unit Price ROOF-1 – Rigid Insulation	\$/ Sq. Ft
Unit Price ROOF-2 – Tapered Insulation	\$/ Sq. Ft

- **12.** The Undersigned has attached the following documents to this Bid:
 - A. 004100 Non-Collusive Affidavit
 - B. 004200 Indemnification and Hold-Harmless Clause
 - C. 004300 Certificate of Compliance with the Iran Divestment Act
 - D. 004400 Sexual Harassment Written Policy and Training Certification
 - E. 004500 Bid Bond / Certified Check
 - F. 004600, 004601, 004602, 004603, 0046004 Statement of Bidder's Qualifications AIA Document A305 and Exhibits A, B, C, and D

(BID FORM CONTINUES NEXT PAGE)

(Name of Bidder)

				(Name of Bidder)
Legal name of person, partnership, joint venture or	r corporation (please	type)		(If Corporation, affix corporate seal)
Address (please type)				
Federal ID No. or Social Security No	. (please type)			
Phone No. (please type)				
Name and title of signer (please type	e)			
Signature			Date	
If a Corporation Name			Address	
	_, PRESIDEN	Τ		
	_ , SECRETAR	Y		
	_, TREASURE	R		
If a Partnership Name	_	Address		
	_			
If a Joint Venture Name	_	Address		
	_			

		(Name of Bidder)
If an Individual Name of Individual	Address	

See Specifications Sections 004100, 004200, 004300, 004400, 004500, 004600, 004601, 004602, 004603, and 004604 for additional forms to be included with bid proposal.

END OF BID FORM

BID FORM

FOR

ORANGE ULSTER BOCES

ADDITIONS & ALTERATIONS TO EMANUEL AXELROD SPECIAL EDUCATION CENTER

CONTRACT NO. 4 – PLUMBING WORK

Owner Information: Orange Ulster BOCES 53 Gibson Road Goshen, New York 10924

Attn: Mark Coleman, Assistant Superintendent for Finance & Management

Project Location:
Orange Ulster BOCES – Gibson Road Campus
Emanuel Axelrod Education Center
53 Gibson Road
Goshen, New York 10924

- 1. The Undersigned hereby declares that it has carefully examined all Bidding and Contract Documents and has inspected the actual location of Work, together with the local sources of supply, and has satisfied itself as to all quantities and conditions, and understands that in signing this Proposal, it waives all rights to plead any misunderstanding regarding the same.
- 2. The Undersigned further understands and agrees that it is to do, perform and complete all the Work in accordance with the Contract Documents and Contract and to accept in full compensation therefor, the amount of the Base Bid, modified by such additive or deductive alternatives, if any, as are accepted by the Owner.
- 3. In submitting this Bid, the Undersigned agrees:
 - a. To hold the Bid open for forty-five (45) days after Bid Opening.
 - b. To accept the provisions of the Instructions to Bidders.
 - c. To enter into and execute a Contract and the PLA within ten (10) days of the Notice of Award issue date, and to simultaneously furnish Performance and Labor and Material Bonds.
 - d. To enter into, become signatory to, and to abide by, the provisions of the Project Labor Agreement with the Hudson Valley Building and Construction Trades Council, AFLCIO and the signatory local unions. A copy of this Project Labor Agreement ("PLA") is included in the specifications as Section 007013.
 - e. To require any and all of its subcontractors of any tier on the Orange Ulster BOCES Additions and Alterations to Emanuel Axelrod Education Building Project to become signatory to, and to abide by, the PLA.
 - f. To commence the Work immediately upon receipt of Notice of Award.
- 4. The Undersigned agrees to the stated percentages for Changes in the Work in accordance with Invitation/Instructions to Bidders and Article 7 AIA 232-2019
- 5. The Undersigned agrees that the Work proposed herein will be Substantially Complete the dates indicated in specification Section 011000 "Summary" and in the Project Milestone Schedule following Section 011000.

- 6. By submission of this Bid, each Bidder and each person signing on behalf of any Bidder certifies, and in the case of a joint Bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of the party's knowledge and belief:
 - a. the prices in this Bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices, with any other Bidder or with any competitor,
 - b. unless otherwise required by law, the prices that 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
 - c. 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.

A Bid shall not be considered for award, nor shall any award be made where a., b., and c. above have not been complied with, provided however, that if in any case the Bidder cannot make the foregoing certification, the Bidder shall so state and shall furnish, with the Bid, a signed statement which sets forth in detail the reasons therefor. Where a., b., and c. 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 a Bidder (a) has published price lists, rates or tariffs covering items being procured, (b) has informed prospective customers of proposed or pending publication of new or revised price 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 this Section.

- 7. The Undersigned understands that the Owner reserves the right to accept or reject any or all Bids and to waive any informalities in the bidding.
- 8. The Undersigned acknowledges the receipt of the following addenda, but agrees that it is bound by all addenda whether or not listed herein:

Addendum Number	<u>Date of Addendum</u>

9.	BASE BID	
	All labor, material, services and equipment necessary for comp on the Drawings and the Technical Specifications for Contract	eletion of the Work shown No. 4 PLUMBING WORK:
	\$	(in numbers)
		Dollars (in words)
10.	ALTERNATES	
	The Undersigned agrees to provide all work in accordance with Specifications and the Drawings, and Section 012300 "Alternation of related coordination, modification, or adjustments for the following specific sp	es" and includes all costs
3.	ADD ALTERNATE NO.3: RENOVATION OF EXISTING PO	OL AND ADJ. SPACES
	ADD	Dollars (\$)
The U	SCHEDULE OF UNIT PRICES TRACT NO. 4 – PLUMBING WORK Undersigned agrees to perform all work as drawn and specified nit prices given. See Section 012200 "Unit Prices" for further inf	
Un	it Price PC-1 – Piping Insulation	
		\$/LF 1inch or Less \$/LF 1.25inch – 2inch \$/LF 2.5" - Greater

		(Name of Bidder)
	Unit Price PC-2 – Ball Valve Shutoffs	\$/Each 1inch or Less \$/Each 1.25inch – 2inch \$/Each 2.5" - Greater
	Unit Price PC-3 – Roof Drain Body and Piping	\$/Each
12.	The Undersigned has attached the following docume A. 004100 Non-Collusive Affidavit B. 004200 Indemnification and Hold-Harmless CIC. 004300 Certificate of Compliance with the Iran D. 004400 Sexual Harassment Written Policy and E. 004500 Bid Bond / Certified Check F. 004600, 004601, 004602, 004603, 0046004 St Document A305 and Exhibits A, B, C, and D	ause Divestment Act Training Certification
 Leg	al name of person, partnership, joint venture or corporation (please type)	(If Corporation, affix corporate seal)
Ad	dress (please type)	
Fe	deral ID No. or Social Security No. (please type)	
Ph	one No. (please type)	
Na	me and title of signer (please type)	

(BID FORM CONTINUES NEXT PAGE)

Signature

Date

If a Corporation Name		Address		
	, PRESIDE	NT		
	, SECRET	, SECRETARY		
	, TREASUI	_ , TREASURER		
If a Partnership Name		Address		
If a Joint Venture Name		Address		
If an Individual Name of Individual		Address		

See Specifications Sections 004100, 004200, 004300, 004400, 004500, 004600, 004601, 004602, 004603, and 004604 for additional forms to be included with bid proposal.

END OF BID FORM

(Name of Bidder)

BID FORM

FOR

ORANGE ULSTER BOCES

ADDITIONS & ALTERATIONS TO EMANUEL AXELROD SPECIAL EDUCATION CENTER

CONTRACT NO. 5 – MECHANICAL WORK

Owner Information: Orange Ulster BOCES 53 Gibson Road Goshen, New York 10924

Attn: Mark Coleman, Assistant Superintendent for Finance & Management

Project Location:
Orange Ulster BOCES – Gibson Road Campus
Emanuel Axelrod Education Center
53 Gibson Road
Goshen, New York 10924

- The Undersigned hereby declares that it has carefully examined all Bidding and Contract Documents and has inspected the actual location of Work, together with the local sources of supply, and has satisfied itself as to all quantities and conditions, and understands that in signing this Proposal, it waives all rights to plead any misunderstanding regarding the same.
- 2. The Undersigned further understands and agrees that it is to do, perform and complete all the Work in accordance with the Contract Documents and Contract and to accept in full compensation therefor, the amount of the Base Bid, modified by such additive or deductive alternatives, if any, as are accepted by the Owner.
- 3. In submitting this Bid, the Undersigned agrees:
 - a. To hold the Bid open for forty-five (45) days after Bid Opening.
 - b. To accept the provisions of the Instructions to Bidders.
 - c. To enter into and execute a Contract and the PLA within ten (10) days of the Notice of Award issue date, and to simultaneously furnish Performance and Labor and Material Bonds.
 - d. To enter into, become signatory to, and to abide by, the provisions of the Project Labor Agreement with the Hudson Valley Building and Construction Trades Council, AFLCIO and the signatory local unions. A copy of this Project Labor Agreement ("PLA") is included in the specifications as Section 007013.
 - e. To require any and all of its subcontractors of any tier on the Orange Ulster BOCES Additions and Alterations to Emanuel Axelrod Education Building Project to become signatory to, and to abide by, the PLA.
 - f. To commence the Work immediately upon receipt of Notice of Award.
- 4. The Undersigned agrees to the stated percentages for Changes in the Work in accordance with Invitation/Instructions to Bidders and Article 7 AIA 232-2019
- 5. The Undersigned agrees that the Work proposed herein will be Substantially Complete the dates indicated in specification Section 011000 "Summary" and in the Project Milestone Schedule following Section 011000.

(Name	of Bidd	er)
-------	---------	-----

- 6. By submission of this Bid, each Bidder and each person signing on behalf of any Bidder certifies, and in the case of a joint Bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of the party's knowledge and belief:
 - the prices in this Bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices, with any other Bidder or with any competitor,
 - b. unless otherwise required by law, the prices that 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
 - c. 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.

A Bid shall not be considered for award, nor shall any award be made where a., b., and c. above have not been complied with, provided however, that if in any case the Bidder cannot make the foregoing certification, the Bidder shall so state and shall furnish, with the Bid, a signed statement which sets forth in detail the reasons therefor. Where a., b., and c. 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 a Bidder (a) has published price lists, rates or tariffs covering items being procured, (b) has informed prospective customers of proposed or pending publication of new or revised price 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 this Section.

- 7. The Undersigned understands that the Owner reserves the right to accept or reject any or all Bids and to waive any informalities in the bidding.
- 8. The Undersigned acknowledges the receipt of the following addenda, but agrees that it is bound by all addenda whether or not listed herein:

Addendum Number	Date of Addendum

			(Name of Bidder
9.		BASE BID	
		All labor, material, services and equipment necessary for cor on the Drawings and the Technical Specifications for Contrac WORK:	
		\$	(in numbers)
			Dollars (in words)
١٥.		ALTERNATES	
		The Undersigned agrees to provide all work in accordance Specifications and the Drawings, and Section 012300 "Alterr of related coordination, modification, or adjustments for the formula of the section	nates" and includes all costs
	2A.	. ADD ALTERNATE NO.2A: GROUND FLOOR CLASSRO	OMS PART A
		ADD	Dollars (\$)
	2B.	. ADD ALTERNATE NO.2B: GROUND FLOOR CLASSRO	OMS PART B
		ADD	Dollars (\$)
	2C.	. ADD ALTERNATE NO.2C: GROUND FLOOR CLASSRO	OMS PART C
		ADD	Dollars (\$)
	3.	ADD ALTERNATE NO.3: RENOVATION OF EXISTING F	POOL AND ADJ. SPACES
		ADD	Dollars (\$)

11. SCHEDULE OF UNIT PRICES

CONTRACT NO. 5 - MECHANICAL WORK

The Undersigned agrees to perform all work as drawn and specified for the following items at the unit prices given. See Section 012200 "Unit Prices" for further information.

Unit Price MC-1 – Piping Insulation	
γge	\$/LF 1inch or Less
	\$/LF 1.25inch – 2inch
	\$/LF 2.5" - Greater
Unit Price MC-2 – Ball Valve Shutoffs	
Office filed wid-2 — Ball valve officions	\$/Each 1inch or Less
	\$/Each 1.25inch – 2inch
	\$/Each 2.5" - Greater

- **12.** The Undersigned has attached the following documents to this Bid:
 - A. 004100 Non-Collusive Affidavit
 - B. 004200 Indemnification and Hold-Harmless Clause
 - C. 004300 Certificate of Compliance with the Iran Divestment Act
 - D. 004400 Sexual Harassment Written Policy and Training Certification
 - E. 004500 Bid Bond / Certified Check
 - F. 004600, 004601, 004602, 004603, 0046004 Statement of Bidder's Qualifications AIA Document A305 and Exhibits A, B, C, and D

(BID FORM CONTINUES NEXT PAGE)

				(Name of Bidder)
Legal name of person, partnership, joint venture or	corporation (please	e type)		(If Corporation, affix corporate seal)
Address (please type)				
Federal ID No. or Social Security No.	(please type)	-		
Phone No. (please type)				
Name and title of signer (please type)			
Signature			Date	
If a Corporation Name			Address	
	_ , PRESIDEN	T		
	_ , SECRETAF	RY		
	_ , TREASURI	≣R		
If a Partnership Name	_	Address		
	-			
If a Joint Venture Name	_	Address		
	_			

		(Name of Bidder)
If an Individual Name of Individual	Address	

See Specifications Sections 004100, 004200, 004300, 004400, 004500, 004600, 004601, 004602, 004603, and 004604 for additional forms to be included with bid proposal.

END OF BID FORM

BID FORM

FOR

ORANGE ULSTER BOCES

ADDITIONS & ALTERATIONS TO EMANUEL AXELROD SPECIAL EDUCATION CENTER

CONTRACT NO. 6 – ELECTRICAL WORK

Owner Information: Orange Ulster BOCES 53 Gibson Road Goshen, New York 10924

Attn: Mark Coleman, Assistant Superintendent for Finance & Management

Project Location:
Orange Ulster BOCES – Gibson Road Campus
Emanuel Axelrod Education Center
53 Gibson Road
Goshen, New York 10924

- 1. The Undersigned hereby declares that it has carefully examined all Bidding and Contract Documents and has inspected the actual location of Work, together with the local sources of supply, and has satisfied itself as to all quantities and conditions, and understands that in signing this Proposal, it waives all rights to plead any misunderstanding regarding the same.
- 2. The Undersigned further understands and agrees that it is to do, perform and complete all the Work in accordance with the Contract Documents and Contract and to accept in full compensation therefor, the amount of the Base Bid, modified by such additive or deductive alternatives, if any, as are accepted by the Owner.
- 3. In submitting this Bid, the Undersigned agrees:
 - a. To hold the Bid open for forty-five (45) days after Bid Opening.
 - b. To accept the provisions of the Instructions to Bidders.
 - c. To enter into and execute a Contract and the PLA within ten (10) days of the Notice of Award issue date, and to simultaneously furnish Performance and Labor and Material Bonds.
 - d. To enter into, become signatory to, and to abide by, the provisions of the Project Labor Agreement with the Hudson Valley Building and Construction Trades Council, AFLCIO and the signatory local unions. A copy of this Project Labor Agreement ("PLA") is included in the specifications as Section 007013.
 - e. To require any and all of its subcontractors of any tier on the Orange Ulster BOCES Additions and Alterations to Emanuel Axelrod Education Building Project to become signatory to, and to abide by, the PLA.
 - f. To commence the Work immediately upon receipt of Notice of Award.
- 4. The Undersigned agrees to the stated percentages for Changes in the Work in accordance with Invitation/Instructions to Bidders and Article 7 AIA 232-2019
- 5. The Undersigned agrees that the Work proposed herein will be Substantially Complete the dates indicated in specification Section 011000 "Summary" and in the Project Milestone Schedule following Section 011000.

- 6. By submission of this Bid, each Bidder and each person signing on behalf of any Bidder certifies, and in the case of a joint Bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of the party's knowledge and belief:
 - a. the prices in this Bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices, with any other Bidder or with any competitor,
 - b. unless otherwise required by law, the prices that 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
 - c. 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.

A Bid shall not be considered for award, nor shall any award be made where a., b., and c. above have not been complied with, provided however, that if in any case the Bidder cannot make the foregoing certification, the Bidder shall so state and shall furnish, with the Bid, a signed statement which sets forth in detail the reasons therefor. Where a., b., and c. 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 a Bidder (a) has published price lists, rates or tariffs covering items being procured, (b) has informed prospective customers of proposed or pending publication of new or revised price 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 this Section.

- 7. The Undersigned understands that the Owner reserves the right to accept or reject any or all Bids and to waive any informalities in the bidding.
- 8. The Undersigned acknowledges the receipt of the following addenda, but agrees that it is bound by all addenda whether or not listed herein:

Addendum Number	<u>Date of Addendum</u>

			(Name of Bidder
9.		BASE BID	
		All labor, material, services and equipment necessary for com on the Drawings and the Technical Specifications for Contract WORK:	
		\$	(in numbers)
			Dollars (in words)
10.		ALTERNATES	
		The Undersigned agrees to provide all work in accordance w Specifications and the Drawings, and Section 012300 "Alterna of related coordination, modification, or adjustments for the fol	ites" and includes all costs
	2A.	. ADD ALTERNATE NO.2A: GROUND FLOOR CLASSROO	DMS PART A
		ADD	Dollars (\$)
	2B.	. ADD ALTERNATE NO.2B: GROUND FLOOR CLASSROO	DMS PART B
		ADD	Dollars (\$)
	2C	. ADD ALTERNATE NO.2C: GROUND FLOOR CLASSROO	DMS PART C
		ADD	Dollars (\$)
	3.	ADD ALTERNATE NO.3: RENOVATION OF EXISTING PO	OOL AND ADJ. SPACES
		ADD	Dollars (\$)

			(Name of Bidder
4	ADD ALTERNATE NO.4: E	XTERIOR PLAZA / COURT	YARD
	ADD		Dollars (\$)
11.	SCHEDULE OF UNIT PRICES	3	
	NOT APPLICABLE		
12.	The Undersigned has attached A. 004100 Non-Collusive Affi B. 004200 Indemnification and C. 004300 Certificate of Com D. 004400 Sexual Harassmel E. 004500 Bid Bond / Certifie F. 004600, 004601, 004602, 0000 Document A305 and Exhib	davit d Hold-Harmless Clause pliance with the Iran Divest nt Written Policy and Trainii d Check 004603, 0046004 Statemen	ment Act ng Certification
Legal n	ame of person, partnership, joint venture or c	orporation (please type)	(If Corporation, affix corporate seal)
Addre	ess (please type)		
Fede	ral ID No. or Social Security No.	(please type)	
Phon	e No. (please type)		
Name	and title of signer (please type)		
Signa	ture		Date
If a C	orporation	Ac	ddress
		, PRESIDENT	
		, SECRETARY	
		, TREASURER	

		(Name of Bidder)
If a Partnership Name	Address	;
If a Joint Venture Name	Address	s
If an Individual Name of Individual	Address 	.

See Specifications Sections 004100, 004200, 004300, 004400, 004500, 004600, 004601, 004602, 004603, and 004604 for additional forms to be included with bid proposal.

END OF BID FORM

NON-COLLUSIVE AFFIDAVIT

Every bid or proposal made to a political subdivision of the State or any public department, agency or official thereof or to a fire district or any agency or official thereof, for work or services performed or to be performed or goods sold to or to be sold, shall contain the following statement subscribed by the bidder and affirmed by such bidder as true under the penalties of perjury and is made pursuant to Section 103d of the General Municipal Law of the State of New York as amended by Laws of 1966.

NON-COLLUSIVE BIDDING CERTIFICATION

- a. By submission of this bid each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its' own organization, under penalty of perjury, that to the best of his knowledge and belief:
 - 1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices, with any other bidder or with any competitor.
 - 2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to the 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. A bid shall not be considered for award, nor shall any award be made (a)1, 2 and 3 above, have not been complied with; provided, however, that if any case the bidder cannot make the foregoing certification, the bidder shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons, therefore.

Where (a)1, 2 and 3 above have not been complied with, the bid shall not be considered for award nor shall any award be made unless the head of purchasing unit of the political subdivision, public department, agency or official thereof to which bid is made, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

By submission of this Proposal

- each bidder and each person signing on behalf of any bidder certifies, and in the case of a
 joint bid each party thereto certifies as to its own organization, under penalty of perjury, that
 to the best of its knowledge and belief that each bidder is not on the list created pursuant to
 paragraph (b) of subdivision 3 of Section 165-a of the state finance law."
- the Undersigned acknowledges that they have visited the site, informed themselves of the existing conditions, and have included in the Proposal a sum to cover the costs of all items in the contracts.

(NON-COLLUSIVE AFFIDAVIT CONTINUES NEXT PAGE)

		(Name of Bidder)
Respectfully submitted,		
Contractor signature		
Ву	Title	
Business Name:		
Address:		
Telephone Number:		
Attest:	Title	

SEAL IF CORPORATION

END OF NON-COLLUSIVE AFFIDAVIT FORM

((Name of Bidder)

INDEMNIFICATION AND HOLD HARMLESS CLAUSE

Contractor Agrees to indemnify and save harmless the Owner, and any of their agents, assigns, employees or independent contractors, the Architect and persons in his employ, from any and all liability for damages for injury to the person or property of another and from all suits and actions and all costs and damages to which such parties may be subjected resulting from the Contractor's performance of this contract, whether such performance be by the Contractor, or by any Subcontractor or employee.

I certify that I have	e been duly authoriz	ed to execute this Agreement on behalf of:
	(Name o	of Contractor)
Dated:	Signed	
	_	(Print Name)
		(Title)

END OF INDEMNIFICATION AND HOLD-HARMLESS FORM

1	(Name of Bidder)

CERTIFICATION OF COMPLIANCE WITH THE IRAN DIVESTMENT ACT

As a result of the Iran Divestment Act of 2012 (the "Act"), Chapter 1 of the 2012 Laws of New York, a new provision has been added to State Finance Law (SFL) § 165-a and New York General Municipal Law § 103-g, both effective April 12, 2012. Under the Act, the Commissioner of the Office of General Services (OGS) will be developing a list of "persons" who are engaged in "investment activities in Iran" (both are defined terms in the law) (the "Prohibited Entities List"). Pursuant to SFL § 165-a(3)(b), the initial list is expected to be issued no later than 120 days after the Act's effective date at which time it will be posted on the OGS website.

By submitting a bid in response to this solicitation or by assuming the responsibility of a Contract awarded hereunder, each Bidder/Contractor, any person signing on behalf of any Bidder/Contractor and any assignee or subcontractor and, in the case of a joint bid, each party thereto, certifies, under penalty of perjury, that once the Prohibited Entities List is posted on the OGS website, that to the best of its knowledge and belief, that each Bidder/Contractor and any subcontractor or assignee is not identified on the Prohibited Entities List created pursuant to SFL § 165-a(3)(b).

Additionally, Bidder/Contractor is advised that once the Prohibited Entities List is posted on the OGS Website, any Bidder/Contractor seeking to renew or extend a Contract or assume the responsibility of a Contract awarded in response to this solicitation must certify at the time the Contract is renewed, extended or assigned that it is not included on the Prohibited Entities List.

During the term of the Contract, should the School District receive information that a Bidder/Contractor is in violation of the above-referenced certification, the School District will offer the person or entity an opportunity to respond. If the person or entity fails to demonstrate that he/she/it has ceased engagement in the investment which is in violation of the Act within 90 days after the determination of such violation, then the School District shall take such action as may be appropriate including, but not limited to, imposing sanctions, seeking compliance, recovering damages or declaring the Bidder/Contractor in default. The School District reserves the right to reject any bid or request for assignment for a Bidder/Contractor that appears on the Prohibited Entities List prior to the award of a contract and to pursue a responsibility review with respect to any Bidder/Contractor that is awarded a contract and subsequently appears on the Prohibited Entities List.

I,	, being (duly sworn, depos	es and says
that he/she is the	of the	· .	
Corporation and that neither the on the Prohibited Entities List.	Bidder/ Contractor nor any prop	osed subcontracto	or is identified
_			SIGNED
SWORN to before me this	day of	,2024	
Notary Public:			

OR

/ N. I.	(D:11)
INIAMA	Of BIDDER
(INAIIIC	of Bidder)

DECLARATION OF BIDDER'S INABILITY TO PROVIDE CERTIFICATION OF COMPLIANCE WITH THE IRAN DIVESTMENT ACT

Bidders shall complete this form if they cannot certify that the bidder /contractor or any proposed subcontractor is not identified on the Prohibited Entities List. The District reserves the right to

undertake any investigation into the information provided herein or to request additional information from the bidder. Name of the Bidder: Address of Bidder Has bidder been involved in investment activities in Iran?___ Describe the type of activities including but not limited to the amounts and the nature of the investments (e.g., banking, energy, real estate): ______ If so, when did the first investment activity occur? Have the investment activities ended? If so, what was the date of the last investment activity? _____ If not, have the investment activities increased or expanded since April 12, 2012? Has the bidder adopted, publicized, or implemented a formal plan to cease the investment activities in Iran and to refrain from engaging in any new investments in Iran? If so, provide the date of the adoption of the plan by the bidder and proof of the adopted resolution, if any and a copy of the formal plan. In detail, state the reasons why the bidder cannot provide the Certification of Compliance with the Divestment Act below (additional attached): Iran pages may be I, _____ being duly sworn, deposes and says that he/she is the of the _____ Corporation and the foregoing is true and accurate. SIGNED SWORN to before me this ______ day of ______, 2024

END OF IRAN DIVESTMENT FORM

Notary Public: _____

(Name of Bidder)

SEXUAL HARASSMENT WRITTEN POLICY & TRAINING CERTIFICATION

(To be Completed by Each Bidder)

I, am (Name of Individual Signing th	, being duly sworn, deposes and says that I ame of Individual Signing this Certification)					
,	,					
the	of the					
(Title/Position of Signer)	(Name of Bidder)					
and that by submission of this bid, I certify on behalf of the above-named bidder, and in case of a joint bid each party thereto certifies as to its own organization, under penalty perjury, that the above-named bidder has and has implemented a written policy address sexual harassment prevention in the workplace and provides annual sexual harassm prevention training to all of its employees. Such policy, at a minimum, meets the requirement of Section 201-g of the New York State Labor Law.						
	<u>Signature</u>					
Sworn to before me this						
day of, 2024						
Notary Public						

END OF SEXUAL HARASSMENT POLICY FORM

Contractor's Qualification Statement

SUBMITTED BY:

THE PARTIES SHOULD EXECUTE A SEPARATE CONFIDENTIALITY AGREEMENT IF THEY INTEND FOR ANY OF THE INFORMATION IN THIS A305-2020 TO BE HELD CONFIDENTIAL.

SUBMITTED TO:

Orange Ulster BOCES 53 Gibson Rd, Goshen, NY 10924
TYPE OF WORK TYPICALLY PERFORMED (Indicate the type of work your organization typically performs, such as general contracting, construction manager as constructor services, HVAC contracting, electrical contracting, plumbing contracting, or other.)
THIS CONTRACTOR'S QUALIFICATION STATEMENT INCLUDES THE FOLLOWING: (Check all that apply.)
 [X] Exhibit A – General Information [X] Exhibit B – Financial and Performance Information [X] Exhibit C – Project-Specific Information [X] Exhibit D – Past Project Experience [] Exhibit E – Past Project Experience (Continued)
CONTRACTOR CERTIFICATION The undersigned certifies under oath that the information provided in this Contractor's Qualification Statement is true and sufficiently complete so as not to be misleading.
Organization's Authorized Representative Signature
Printed Name and Title
NOTARY State of:
County of:
Signed and sworn to before me this day of
Notary Signature
My commission expires:

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

Additions and Deletions Report for

AIA® Document A305® – 2020

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 15:37:25 ET on 10/29/2024.

PAGE 1

Orange Ulster BOCES 53 Gibson Rd, Goshen, NY 10924

•••

[X] Exhibit A – General Information

[X] Exhibit B – Financial and Performance Information

[X] Exhibit C – Project-Specific Information

[X] Exhibit D – Past Project Experience

Certification of Document's Authenticity

AIA® Document D401 ™ - 2003

I, tj, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document
simultaneously with its associated Additions and Deletions Report and this certification at 15:37:25 ET on 10/29/2024
under Order No. 3104238611 from AIA Contract Documents software and that in preparing the attached final
document I made no changes to the original text of AIA® Document A305 TM – 2020, Contractor's Qualification
Statement, other than those additions and deletions shown in the associated Additions and Deletions Report.

(Signed)			
(Title)			
(Dated)			

General Information

This Exhibit is part of the Contractor's Qualification Statement, submitted by and dated the day of in the year (In words, indicate day, month and year.)

§ A.1 ORGANIZATION

§ A.1.1 Name and Location

§ A.1.1.1 Identify the full legal name of your organization.

§ A.1.1.2 List all other names under which your organization currently does business and, for each name, identify jurisdictions in which it is registered to do business under that trade name.

§ A.1.1.3 List all prior names under which your organization has operated and, for each name, indicate the date range and jurisdiction in which it was used.

§ A.1.1.4 Identify the address of your organization's principal place of business and list all office locations out of which your organization conducts business. If your organization has multiple offices, you may attach an exhibit or refer to a website.

§ A.1.2 Legal Status

§ A.1.2.1 Identify the legal status under which your organization does business, such as sole proprietorship, partnership, corporation, limited liability corporation, joint venture, or other.

- If your organization is a corporation, identify the state in which it is incorporated, the date of incorporation, and its four highest-ranking corporate officers and their titles, as applicable.
- If your organization is a partnership, identify its partners and its date of organization.
- .3 If your organization is individually owned, identify its owner and date of organization.

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- If the form of your organization is other than those listed above, describe it and identify its individual leaders:
- § A.1.2.2 Does your organization own, in whole or in part, any other construction-related businesses? If so, identify and describe those businesses and specify percentage of ownership.

§ A.1.3 Other Information

- § A.1.3.1 How many years has your organization been in business?
- § A.1.3.2 How many full-time employees work for your organization?
- § A.1.3.3 List your North American Industry Classification System (NAICS) codes and titles. Specify which is your primary NAICS code.
- § A.1.3.4 Indicate whether your organization is certified as a governmentally recognized special business class, such as a minority business enterprise, woman business enterprise, service disabled veteran owned small business, woman owned small business, small business in a HUBZone, or a small disadvantaged business in the 8(a) Business Development Program. For each, identify the certifying authority and indicate jurisdictions to which such certification applies.

§ A.2 EXPERIENCE

- § A.2.1 Complete Exhibit D to describe up to four projects, either completed or in progress, that are representative of your organization's experience and capabilities.
- § A.2.2 State your organization's total dollar value of work currently under contract.
- § A.2.3 Of the amount stated in Section A.2.2, state the dollar value of work that remains to be completed:
- § A.2.4 State your organization's average annual dollar value of construction work performed during the last five years.

§ A.3 CAPABILITIES

- § A.3.1 List the categories of work that your organization typically self-performs.
- § A.3.2 Identify qualities, accreditations, services, skills, or personnel that you believe differentiate your organization from others.

§ A.3.3 Does your organization provide design collaboration or pre-construction services? If so, describe those services.

§ A.3.4 Does your organization use building information modeling (BIM)? If so, describe how your organization uses BIM and identify BIM software that your organization regularly uses.

§ A.3.5 Does your organization use a project management information system? If so, identify that system.

§ A.4 REFERENCES

§ A.4.1 Identify three client references:

(Insert name, organization, and contact information)

§ A.4.2 Identify three architect references:

(Insert name, organization, and contact information)

§ A.4.3 Identify one bank reference:

(Insert name, organization, and contact information)

§ A.4.4 Identify three subcontractor or other trade references:

(Insert name, organization, and contact information)

(1667725158)

Financial and Performance Information

This Exhibit is part of the Contractor's Qualification Statement, submitted by and dated the day of in the year (In words, indicate day, month and year.)

§ B.1 FINANCIAL

§ B.1.1 Federal tax identification number:

§ B.1.2 Attach financial statements for the last three years prepared in accordance with Generally Accepted Accounting Principles, including your organization's latest balance sheet and income statement. Also, indicate the name and contact information of the firm that prepared each financial statement.

§ B.1.3 Has your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management, been the subject of any bankruptcy proceeding within the last ten years?

§ B.1.4 Identify your organization's preferred credit rating agency and identification information.

(Identify rating agency, such as Dun and Bradstreet or Equifax, and insert your organization's identification number or other method of searching your organization's credit rating with such agency.)

§ B.2 DISPUTES AND DISCIPLINARY ACTIONS

§ B.2.1 Are there any pending or outstanding judgments, arbitration proceedings, bond claims, or lawsuits against your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management, or any of the individuals listed in Exhibit A, Section 1.2, in which the amount in dispute is more than \$75,000? (If the answer is yes, provide an explanation.)

§ B.2.2 In the last five years has your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management: (If the answer to any of the questions below is yes, provide an explanation.)

- .1 failed to complete work awarded to it?
- .2 been terminated for any reason except for an owners' convenience?

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- .3 had any judgments, settlements, or awards pertaining to a construction project in which your organization was responsible for more than \$75,000?
- filed any lawsuits or requested arbitration regarding a construction project?
- § B.2.3 In the last five years, has your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management; or any of the individuals listed in Exhibit A Section 1.2: (If the answer to any of the questions below is yes, provide an explanation.)
 - been convicted of, or indicted for, a business-related crime?
 - .2 had any business or professional license subjected to disciplinary action?
 - been penalized or fined by a state or federal environmental agency?

(1649177154)

Project Specific Information

This Exhibit is part of the Contractor's Qualification Statement, submitted by and dated the day of in the year (In words, indicate day, month and year.)

PROJECT:

(Name and location or address.)

CONTRACTOR'S PROJECT OFFICE:

(Identify the office out of which the contractor proposes to perform the work for the Project.)

TYPE OF WORK SOUGHT

(Indicate the type of work you are seeking for this Project, such as general contracting, construction manager as constructor, design-build, HVAC subcontracting, electrical subcontracting, plumbing subcontracting, etc.)

CONFLICT OF INTEREST

Describe any conflict of interest your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management, or any of the individuals listed in Exhibit A Section 1.2, may have regarding this Project.

§ C.1 PERFORMANCE OF THE WORK

§ C.1.1 When was the Contractor's Project Office established?

§ C.1.2 How many full-time field and office staff are respectively employed at the Contractor's Project Office?

§ C.1.3 List the business license and contractor license or registration numbers for the Contractor's Project Office that pertain to the Project.

§ C.1.4 Identify key personnel from your organization who will be meaningfully involved with work on this Project and indicate (1) their position on the Project team, (2) their office location, (3) their expertise and experience, and (4) projects similar to the Project on which they have worked.

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- § C.1.5 Identify portions of work that you intend to self-perform on this Project.
- § C.1.6 To the extent known, list the subcontractors you intend to use for major portions of work on the Project.

§ C.2 EXPERIENCE RELATED TO THE PROJECT

- **§ C.2.1** Complete Exhibit D to describe up to four projects performed by the Contractor's Project Office, either completed or in progress, that are relevant to this Project, such as projects in a similar geographic area or of similar project type. If you have already completed Exhibit D, but want to provide further examples of projects that are relevant to this Project, you may complete Exhibit E.
- § C.2.2 State the total dollar value of work currently under contract at the Contractor's Project Office:
- § C.2.3 Of the amount stated in Section C.2.2, state the dollar value of work that remains to be completed:
- **§ C.2.4** State the average annual dollar value of construction work performed by the Contractor's Project Office during the last five years.
- § C.2.5 List the total number of projects the Contractor's Project Office has completed in the last five years and state the dollar value of the largest contract the Contractor's Project Office has completed during that time.

§ C.3 SAFETY PROGRAM AND RECORD

- § C.3.1 Does the Contractor's Project Office have a written safety program?
- § C.3.2 List all safety-related citations and penalties the Contractor's Project Office has received in the last three years.
- **§ C.3.3** Attach the Contractor's Project Office's OSHA 300a Summary of Work-Related Injuries and Illnesses form for the last three years.
- **§ C.3.4** Attach a copy of your insurance agent's verification letter for your organization's current workers' compensation experience modification rate and rates for the last three years.

§ C.4 INSURANCE

- **§ C.4.1** Attach current certificates of insurance for your commercial general liability policy, umbrella insurance policy, and professional liability insurance policy, if any. Identify deductibles or self-insured retentions for your commercial general liability policy.
- § C.4.2 If requested, will your organization be able to provide property insurance for the Project written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis?

§ C.4.3 Does your commercial general liability policy contain any exclusions or restrictions of coverage that are prohibited in AIA Document A101-2017, Exhibit A, Insurance A.3.2.2.2? If so, identify.

§ C.5 SURETY

- § C.5.1 If requested, will your organization be able to provide a performance and payment bond for this Project?
- § C.5.2 Surety company name:
- § C.5.3 Surety agent name and contact information:
- § C.5.4 Total bonding capacity:
- § C.5.5 Available bonding capacity as of the date of this qualification statement:

User Notes: User Notes: 10 report copyright violations, e-mail doctino@alacontracts.com. (1969576553)



Contractor's Past Project Experience

	1	2	3	4
PROJECT NAME				
PROJECT LOCATION				
PROJECT TYPE				
OWNER				
ARCHITECT				
CONTRACTOR'S PROJECT EXECUTIVE				
KEY PERSONNEL (include titles)				
PROJECT DETAILS	Contract Amount	Contract Amount	Contract Amount	Contract Amount
	Completion Date	Completion Date	Completion Date	Completion Date
	% Self-Performed Work	% Self-Performed Work	% Self-Performed Work	% Self-Performed Work
PROJECT DELIVERY METHOD	Design-bid-build Design-build CM constructor CM advisor Other:	Design-bid-build Design-build CM constructor CM advisor Other:	Design-bid-build Design-build CM constructor CM advisor Other:	Design-bid-build Design-build CM constructor CM advisor Other:
SUSTAINABILITY CERTIFICATIONS				

Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition

AGREEMENT made as of the day of in the year (In words, indicate day, month, and year.)

BETWEEN the Owner:

(Name, legal status, address, and other information)

Orange Ulster BOCES 53 Gibson Road Goshen, New York 10924

and the Contractor:

(Name, legal status, address, and other information)

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

Addition and Alterations at the Emmanuel Axelrod Special Education Center 103 Gibson Road Goshen, New York 10924 SED # 44-90-00-00-0-009-036

The Construction Manager: (Name, legal status, address, and other information)

The Palombo Group 22 Noxon Street Poughkeepsie, New York 12601

The Architect:

(Name, legal status, address, and other information)

KG+D Architects, P.C. 285 Main Street Mount Kisco, New York 10549

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:

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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

TABLE OF ARTICLES

- THE CONTRACT DOCUMENTS
- THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION
- **CONTRACT SUM**
- 5 **PAYMENTS**
- **DISPUTE RESOLUTION** 6
- **TERMINATION OR SUSPENSION** 7
- 8 **MISCELLANEOUS PROVISIONS**
- **ENUMERATION OF CONTRACT DOCUMENTS**

(Paragraphs deleted)

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, the Bidding Documents, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than Modifications, appears in Article 9. The Contractor represents that it has fully reviewed the Contract Documents and agrees that the Contract Documents describe, to the best of the Contractor's knowledge, the Work necessary to furnish and provide (and that the Contractor shall furnish and provide) a fully functioning Project consistent with the Contract Documents.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, or reasonably inferable by the Contractor as necessary to produce the results intended by the Contract Documents, for the Work, except as specifically indicated in the Contract Documents to be the responsibility of others. It is the intent of the parties to include within the Work any and all labor, materials, equipment and services that, although not expressly indicated in the Contract Documents, are reasonably inferable therefrom to construct complete and workable systems for the satisfactory performance, execution, final completion and use of the Work and Project.

ARTICLE 3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be: (Check one of the following boxes.)

[X]	The date of this Agreement.
[]	A date set forth in a notice to proceed issued by the Owner.
[]	Established as follows: (Insert a date or a means to determine the date of commencement of the Work.

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 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.)

As per Project Schedule provided in the Contract Documents.

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of all of the Contractors for the Project are to be completed prior to Substantial Completion of the entire Work of all of the Contractors for the Project, the Contractors shall achieve Substantial Completion of such portions by the following dates:

Portion of Work

Substantial Completion Date

As per Project Schedule provided in the **Contract Documents**

§ 3.4 When the Work of this Contract, or any Portion Thereof, is Substantially Complete

§ 3.4.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall substantially complete the entire Work of this Contract:

(Check one of the following boxes and complete the necessary information.)

- Not later than () calendar days from the date of commencement of the Work.
- [X] By the following date: as per Project Schedule provided in the Contract Documents.
- § 3.4.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of this Contract are to be substantially complete prior to when the entire Work of this Contract shall be substantially complete, the Contractor shall substantially complete such portions by the following dates:

Portion of Work

Date to be substantially complete

As per Project Schedule provided in the Contract Documents

- § 3.4.3 Time is of the essence in the performance of the Contract Documents, including, without limitation, the Substantial Completion dates established herein. The Contractor shall proceed expeditiously with adequate forces and shall use its best efforts to keep its Work and the Project on schedule, and the Contractor shall achieve the completion times established within the Contract Documents. Milestone dates set forth in the Project Schedule are dates critical to the Owner's operations that establish when the Work or a part thereof is to commence and be complete. All milestone dates are of the essence.
- § 3.4.4 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 as set forth in Section 4.5.

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.)

L	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

(Based on the selection above, complete Section 4.2, 4.3 or 4.4 below.)

Section 4.4 below

Init.

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§ 4.2 Stipulated Sum

- § 4.2.1 The Contract Sum shall be (\$), subject to additions and deductions as provided in the Contract Documents.
- § 4.2.1.1 The Stipulated Sum shall not be adjusted for increased labor or material costs, whether foreseen or unforeseen, which may occur between the date of this Agreement and the Commencement Date, or which may occur between the Commencement Date and the Substantial Completion Date or Dates set forth in this Agreement.

§ 4.2.2 Alternates

§ 4.2.2.1 Alternates, if any, included in the Contract Sum:

Item Price

§ 4.2.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. (Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item Price Conditions for Acceptance

§ 4.2.3 Allowances, if any, included in the Contract Sum: (*Identify each allowance*.)

Item Price

§ 4.2.4 Unit prices, if any:

(Identify the item and state the unit price, and quantity limitations, if any, to which the unit price will be applicable.)

Item Units and Limitations Price per Unit (\$0.00)

§ 4.3 Liquidated damages, if any:

(Insert terms and conditions for liquidated damages, if any, to be assessed in accordance with Section 3.4.)

§ 4.3.1 The Contractor recognizes that achieving Substantial Completion of the Work in accordance with the time limits set forth in this Agreement and as further set forth in the Project Manual and/or Bidding Documents is a material condition of this Agreement, and that if the Contractor fails to achieve Substantial Completion of the Work, or designated parts thereof, in accordance with such schedule, the Owner will incur damages as a result. The Owner and Contractor agree that the amount of such damages is difficult to ascertain with any precision. The Owner and Contractor have attempted to estimate reasonable daily figures for liquidated damages, not to penalize the Contractor for late completion, but to reasonably estimate probable losses and damages to the Owner in the event of the late completion. Liquidated damages as used and defined in Section 8.4 of the AIA Document A232TM—2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, as modified for this Project.

§ 4.3.2 The

(Paragraphs deleted)

Contractor acknowledges that the liquidated damages amounts set forth above represent a fair and reasonable estimate of the Owner's probable losses, damages and/or expenses, and are not a penalty, for late completion of the Work and the phases thereof.

- § 4.3.3 The Owner shall be entitled to offset any liquidated damages owed by Contractor against any amounts owing by the Owner to the Contractor.
- § 4.3.4 The Owner's right to liquidated damages shall survive abandonment of the Work by the Contractor and the Owner's termination of the Contract.

Init.

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User Notes:

(Paragraphs deleted) (Table deleted) (Paragraphs deleted) (Table deleted) (Paragraphs deleted) (Table deleted) (Paragraphs deleted) (Table deleted) (Paragraphs deleted) (Table deleted) (Paragraphs deleted)

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 7th day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the 7th day of the subsequent 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.)

§ 5.1.4 Progress Payments Where the Contract Sum is Based on a Stipulated Sum

- § 5.1.4.1 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. 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. All progress payments made previous to the last and final payment shall be based on estimates and the right is hereby reserved by the Architect for the Owner to make all due and proper corrections in any payment for any previous error.
- § 5.1.4.3 In accordance with AIA Document A232TM—2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, as modified for this Project (hereinafter, "AIA Document A232-2019"), 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:
 - That portion of the Contract Sum properly allocable to completed Work; .1
 - .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
 - .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.
- § 5.1.4.3.2 The amount of each progress payment shall then be reduced by:
 - The aggregate of any amounts previously paid by the Owner; .1
 - .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, Construction Manager or Owner may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019;
- .5 Retainage withheld pursuant to Section 5.1.7; and
- Subtract one hundred fifty percent (150%) of the amount of any lien(s) on public improvement filed against .6 the Contract Sum that has not been released or discharged.

§ 5.1.5 – Intentionally omitted.

(Paragraphs deleted)

§ 5.1.6 – Intentionally omitted.

(Paragraphs deleted)

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to when the Work of this Contract is substantially complete, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

Five percent (5%)

§ 5.1.7.1.1 The following items are not subject to retainage:

(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

None

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

(If the retainage established in Section 5.1.7.1 is to be modified prior to when the entire Work of this Contract is substantially complete, including modifications for completion of portions of the Work as provided in Section 3.4.2, insert provisions for such modifications.)

No retainage reduction prior to Substantial Completion of the entire Work.

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, when the Work of this Contract is substantially complete, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted when the Work of this Contract is substantially complete shall not include retainage as follows:

(Insert any other conditions for release of retainage when the Work of this Contract is substantially complete, or upon Substantial Completion of the Work of all Contractors on the Project or portions thereof.)

Upon Substantial Completion of the Work, the payment shall be less two times the value of any remaining Work to be completed as the Construction Manager recommends and the Architect determines for incomplete Work and an amount necessary to satisfy any claims, liens or judgments against the Contractor that have not been suitably discharged.

§ 5.2 Final Payment

§ 5.2.1 Final Payment Where the Contract Sum is Based on a Stipulated Sum

- § 5.2.1.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when
 - the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work .1 as provided in Article 12 of AIA Document A232–2019, and to satisfy other requirements, if any, which extend beyond final payment;
 - .2 the Contractor has submitted all Closeout documents and complied with the final payment and all closeout requirements of the Contract Documents; and
 - .3 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect.

- § 5.2.1.2 In addition to other required items, including but not limited to those required under Section 9.10 of the General Conditions, the final Application for Payment must be accompanied by the following, all in form and substance satisfactory to the Owner and in compliance with applicable law:
 - .1 permanent certificate(s) of occupancy or use issued by the appropriate governmental authority;
 - .2 all maintenance and operating manuals;
 - .3 marked sets of field drawings and specifications reflecting "as-built" conditions;
 - reproducible Mylar drawings reflecting the location of any concealed utilities, mechanical and electrical systems, and their components;
 - assignments of all guarantees and warranties to the Contractor from Subcontractors, materialmen, vendors, or manufacturers, together with a list of their names, addresses, telephone numbers, and corresponding guarantees and warranties from each; and
 - all other information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner, Architect, or Construction Manager.

(Paragraphs deleted)

- § 5.2.1.3 The Owner's final payment to the Contractor, less any sum required by law to be held due to a lien(s) on public improvement filed against the Contract Sum that has not been released or discharged, shall be made no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment. After final payment, payment of any sums withheld due to a lien against a public improvement filed with the Owner against the Contract Sum will be made to the Contractor when the lien is discharged.
- § 5.3 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located. (Insert rate of interest agreed upon, if any.)

In accordance with Section 106-b(1)(b) of the New York State General Municipal Law.

DISPUTE RESOLUTION ARTICLE 6

§ 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. (Paragraphs deleted)

§ 6.2 Binding Dispute Resolution

For any Claim or dispute arising out of this Agreement, the method of binding dispute resolution shall be as follows: (Check the appropriate box.)

Г]	Arbitration pursuant to	Article 15 of AIA Document A232–2019.
L	1	Aromation pursuant to	Afficie 15 of ATA Document A252-2017.

Litigation in a court of competent jurisdiction in the County of Orange in the State of New York.

[]	Other:	(Specify)
1	1 1 , 1	

(Paragraphs deleted)

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.

(Paragraphs deleted)

§ 7.1.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2019.

(Paragraphs deleted)

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)

Mark Coleman Assistant Superintendent for Finance and Management Services Orange Ulster BOCES 53 Gibson Road Goshen, NY 10924

§ 8.3 The Contractor's representative:

(Name, address, email address, and other information)

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

- § 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in Article 11 of AIA Document A232-2019, and elsewhere in the Contract Documents.
- § 8.5.2 The Contractor shall provide bonds as set forth in Article 11 of AIA Document A232–2019, and elsewhere in the Contract Documents.
- § 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A232–2019, may be given in accordance with AIA Document E203TM—2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with AIA Document E203-2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they will endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

§ 8.7 Intentionally omitted.

§ 8.8 Other provisions:

- § 8.8.1 The Contractor represents and warrants the following to the Owner (in addition to any other representations and warranties contained in the Contract Documents) as an inducement to the Owner to execute this Agreement, which representations and warranties shall survive the execution and delivery of this Agreement, any termination of this Agreement and the final completion of the Work:
 - that it and its Subcontractors are financially solvent, able to pay all debts as they mature and possessed of sufficient working capital to complete the Work and perform all obligations hereunder;
 - .2 that it is able to furnish the plant, tools, materials, supplies, equipment and labor required to complete the Work and perform its obligations hereunder;
 - that it is authorized to do business in the State of New York and the United States and properly licensed by all necessary governmental and public and quasi-public authorities having jurisdiction over it and over the Work and the Project;
 - .4 that its execution of this Agreement and its performance thereof is within its duly authorized powers;

- .5 that its duly authorized representative has visited the site of the Project, is familiar with the local and special conditions under which the Work is to be performed and has correlated on-site observations with the requirements of the Contact Documents; and
- that it possesses a high level of experience and expertise in the business administration, construction, construction management and superintendence or projects of the size, complexity and nature of the particular Project, and that it will perform the Work with the care, skill and diligence of such a contractor.

The foregoing warranties are in addition to, and not in lieu of, any and all other liability imposed upon the Contractor by law with respect to the Contractor's duties, obligations and performance hereunder. The Contractor's liability hereunder shall survive the Owner's final acceptance of and payment for the Work. All representations and warranties set forth in this Agreement, including without limitation, this Section 8.8.1, shall survive the final completion of the Work or the earlier termination of this Agreement. The Contractor acknowledges that the Owner is relying upon the Contractor's skill and experience in connection with the Work called for hereunder.

Upon the execution of this Contract, the Contractor shall, upon request, provide the Owner with unredacted copies of all contracts entered into between the Contractor and subcontractors or material suppliers. The Contractor's obligation to provide the Owner with said contracts shall continue for the duration of the Project.

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A132TM–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition
- .2 Bidding Documents
- .3 AIA Document A232TM–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, as modified
- 4 AIA Document E203TM–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:

(Insert the date of the E203-2013 incorporated into this Agreement.)

N/A

.5 Drawings

(Table deleted)

Refer to the attached **Exhibit B**, **List of Drawings**, all of which drawings listed therein are incorporated herein by reference.

.6 Specifications

(Table deleted)

Refer to the attached Exhibit C, Specifications Table of Contents, all of which sections listed therein are incorporated herein by reference.

.7 Addenda, if any:

Number

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents

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.

Pages

.8 Other Exhibits: N/A

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[] AIA Document A132TM–2019, Exhibit B, Determination of the Cost of the Work

Date

[] AIA Document E235TM–2019, Sustainable Projects Exhibit, Construction Manager as Adviser

Edition, dated as indicated below: (Insert the date of the E235-2019 incorporated into this Agreement.)

	[] Supplementary a	and other Conditions of the Contrac	et: Date	Damas
				Damas
	Document	Title	Date	Dages
				Pages
] ; ; ; ; ; ; ; ; ;	Document A232–2019 proforms, the Contractor's be requirements, and other in are not part of the Contractor's be listed here only if intended in the Exhibit A – Contractor's Exhibit B – List of Drawi Exhibit C – Specifications	documents that are intended to form ovides that the advertisement or invide or proposal, portions of Addender of the Owner with the Owner with the Couments unless enumerated in the documents of the Contract Documents. Bid Form	vitation to bid, Instruct a relating to bidding of in anticipation of rece in this Agreement. Any	tions to Bidders, sample or proposal iving bids or proposals,
OWNER (Signa	ature)	CONTRACTO	OR (Signature)	
(Printed name	e and title)	(Printed nat	me and title)	

SECTION 006100 - BOND REQUIREMENTS

SEE ATTACHMENT TO SECTION FOR ACCEPTABLE BONDING COMPANY RATINGS

- 1.1 Prior to the Owner signing the contract agreement, he will require the Contractor (s) to furnish <u>separate</u> performance and labor and material payment bonds covering the faithful performance of the entire construction contract agreement.
 - The performance bond and the labor and material payment bond shall each be made out in one hundred percent (100%) of the guaranteed maximum contract amount.
- 1.2 The "Performance Bond" and "Labor and Material Payment Bond", A.I.A. Document A-312, as published by The American Institute of Architects shall be used and modified, if necessary, to comply with applicable statutes.
 - NOTE: Date of forms to be used shall be complementary to the date of the contract form and general conditions incorporated within these Bidding and Contract Requirements.
- 1.3 The bonds shall be signed by an official of the bonding company and shall be accompanied by the bonding agent's written power of attorney.
- 1.4 Provide four (4) copies each of the bonds and the power of attorney in order that one (1) copy of each may be attached to each copy of the contract agreement.
- 1.5 The Contractor (s) shall include in his/their proposal(s) amount the total premiums for the performance and labor and material payment bonds.

End of Section

Attachment To Section 006100 - Bonding Requirements

Acceptable Bonding Company Ratings

Contract Amounts (\$)			A.M.	Best Co	mpany R	Rating		
Contract Amounts (\$)	A + XII	B + XI	B + X	ВХ	BIX	B VIII	B VII	B VI
10 Million and Over								
7.5 to 10 Million		A						
5.0 to 7.5 Million								
2.5 to 5.0 Million	A	A	A					
1.0 to 2.5 Million								
0.5 to 1.0 Million	A	A	A		A	A		
0.25 to 0.5 Million						A		
0.25 and Under	A	A	A		A	A	A	A

Bid Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address) Orange Ulster BOCES 53 Gibson Road Goshen, NY 10924

BOND AMOUNT: \$

PROJECT:

(Name, location or address, and Project number, if any) Addition and Alterations at the Emmanuel Axelrod Special Education Center 103 Gibson Road Goshen, New York 10924 SED # 44-90-00-00-0-009-036

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

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

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

User Notes:

furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this day of ,

	(Contractor as Principal)	(Seal)
(Witness)	(Title)	
	(Surety)	(Seal)
(Witness)		

Payment Bond

CONTRACTOR:	SURETY:
(Name, legal status and address)	(Name, legal status and principal place of business)
OWNER:	
(Name, legal status and address)	
Orange Ulster BOCES 53 Gibson Road	
Goshen, NY 10924	
CONSTRUCTION CONTRACT	
Date: Amount: \$ 0.00	
Description:	
(Name and location)	
Addition and Alterations at the	
Emmanuel Axelrod Special Education	Center
103 Gibson Road Goshen, New York 10924	
SED # 44-90-00-00-0-036	
222 1. 30 00 00 00 00	
BOND	
Date: (Not earlier than Construction Contraction)	et Date)
(Not currer than construction contract	i Duic)
Amount: \$	
Modifications to this Bond:	None See Section 18
CONTRACTOR AS PRINCIPAL	SURETY
Company: (Corporate Seal)	Company: (Corporate Seal)
Signature:	Signature:
Name and	Name and

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

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

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials

Title:

(Any additional signatures appear on the last page of this Payment Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

OWNER'S REPRESENTATIVE: (Architect, Engineer or other party:)

AGENT or **BROKER**:

and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

- § 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
- § 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.
- § 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.
- § 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:
- § 5.1 Claimants, who do not have a direct contract with the Contractor,
 - have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - .2 have sent a Claim to the Surety (at the address described in Section 13).
- § 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).
- § 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.
- § 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
- § 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
- § 7.2 Pay or arrange for payment of any undisputed amounts.
- § 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
- § 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
- § 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

- § 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.
- § 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.
- § 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
- § 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.
- § 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
- § 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

- § 16.1 Claim. A written statement by the Claimant including at a minimum:
 - .1 the name of the Claimant;
 - .2 the name of the person for whom the labor was done, or materials or equipment furnished;
 - .3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
 - a brief description of the labor, materials or equipment furnished;
 - .5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
 - .6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the
 - .7 the total amount of previous payments received by the Claimant; and
 - .8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.
- § 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.
- § 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

- § 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
- § 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.
- § 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.
- § 18 Modifications to this bond are as follows:

(Space is provided below for add	litional signatures of add	•	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:	

User Notes:

Performance Bond

CONIT		TND.
CONT	NAC	IUR.

SURETY:

(Name, legal status and address)

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address) Orange Ulster BOCES 53 Gibson Road Goshen, NY 10924

CONSTRUCTION CONTRACT

SED # 44-90-00-00-0-009-036

Date:

Amount: \$ 0.00 Description: (Name and location) Addition and Alterations at the Emmanuel Axelrod Special Education Center 103 Gibson Road Goshen, New York 10924

BOND

Date:

(Not earlier than Construction Contract Date)

Amount: \$

None Modifications to this Bond: See Section 16

CONTRACTOR AS PRINCIPAL SURETY

Company: (Corporate Seal) Company: (Corporate Seal)

Signature: Signature:

Name and Name and

Title: Title:

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or **BROKER**:

OWNER'S REPRESENTATIVE:

(Architect, Engineer or other party:)

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

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

User Notes:

- § 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
 - 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
 - .2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety;
 - .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:
 - After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
 - .2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.
- § 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

- § 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for
 - the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
 - .2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and
 - .3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
- § 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.
- § 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.
- § 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.
- § 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
- § 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.
- § 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

- § 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.
- § 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.
- § 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.
- § 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
- § 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

(Space is provided below for add CONTRACTOR AS PRINCIPAL	litional signatures of ad	dded parties, other than those appearing on the cover pag SURETY		
Company:	(Corporate Seal)	Company:	(Corporate Seal)	
Signature:		Signature:		
Name and Title:		Name and Title:		
Address:		Address:		



General Conditions of the Contract for Construction, Construction Manager as Adviser Edition

for the following PROJECT:

(Name, and location or address)

Addition and Alterations at the Emmanuel Axelrod Special Education Center 103 Gibson Road Goshen, New York 10924 SED # 44-90-00-00-0-009-036

THE CONSTRUCTION MANAGER:

(Name, legal status, and address)

The Palombo Group 22 Noxon Street Poughkeepsie, New York 12601

THE OWNER:

(Name, legal status, and address)

Orange Ulster BOCES 53 Gibson Road Goshen, New York 10924

THE ARCHITECT:

(Name, legal status, and address)

KG+D Architects, PC 285 Main Street Mount Kisco, NY 10549

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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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.

User Notes:

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8	TIME
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SPECIFIC CONFORMANCE TO THE LAWS OF THE STATE OF NEW YORK

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

- § 1.1.1 The Contract Documents. The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter, the "Agreement"), and consist of the Bidding Documents (including, but not limited to, Invitations to Bid, Instructions to Bidders, sample forms, the Contractor's bid or portions of the addenda relating to bidding requirements), the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect.
- § 1.1.2 The Contract. The Contract Documents form the Contract for Construction (hereinafter, the "Contract"). The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and the Construction Manager or the Construction Manager's consultants, (3) between the Owner and the Architect or the Architect's consultants, (4) between the Contractor and the Construction Manager or the Construction Manager's consultants, (5) between the Owner and a Subcontractor or Sub-subcontractor (6) between the Construction Manager and the Architect, or (7) between any persons or entities other than the Owner and Contractor. The Construction Manager and Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of their duties.
- § 1.1.2.1 Where the term "Agreement," "Contract" or "Prime Contract" is used in these General Conditions, and other Contract Documents, it shall mean the separate Owner-Contractor Agreement between the Owner and each Prime Contractor identified in Conditions of the Contract (General, Supplementary and other conditions).
- § 1.1.2.2 The Contractor acknowledges and warrants that it has closely examined all the Contract Documents, that they are suitable and sufficient to enable the Contractor to complete the Work in a timely manner for the Contract Sum, and that they include all work, whether or not shown or described, which reasonably may be inferred to be required or useful for the completion of the Work in full compliance with all applicable statutes, codes, laws, ordinances and regulations.
- § 1.1.3 The Work. The term "Work" means the construction and services required by the Contract Documents, or as reasonably inferable therefrom, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project. The Work includes all of the Contractor's responsibilities as to all labor, parts, supplies, equipment, skill, supervision, transportation services, storage requirements, and other facilities and things necessary, proper or incidental to the carrying out and completion of the terms of the Contract Documents and all other items of cost or value needed to produce, construct, and fully complete the Contractor's Work identified by the Contract Documents.
- § 1.1.4 The Project. The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by other Contractors, and by the Owner's own forces and Separate Contractors.
- § 1.1.5 Contractors. Contractors are persons or entities, other than the Contractor or Separate Contractors, who perform Work under contracts with the Owner that are administered by the Architect and Construction Manager.
- § 1.1.6 Separate Contractors. Separate Contractors are persons or entities who perform construction under separate contracts with the Owner not administered by the Architect and Construction Manager.
- § 1.1.7 The Drawings. The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

- § 1.1.8 The Specifications. The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services and general requirements for the Project.
- § 1.1.9 Instruments of Service. Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials including those in electronic form.
- § 1.1.10 Initial Decision Maker. The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.1.11 Miscellaneous Definitions

- § 1.1.11.1 The terms "knowledge," "recognize" and "discover," their respective derivatives and similar terms in the Contract Documents, as used in reference to the Contractor, shall be interpreted to mean that which the Contractor knows (or should know), recognizes (or should recognize) and discovers (or should discover) in exercising the care, skill, and diligence required by the Contract Documents. The expression "reasonably inferable" and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a contractor familiar with the Project and exercising care, skill, and diligence required of the Contractor by the Contract Documents.
- § 1.1.11.2 The term "any" in the Contract Documents shall be interpreted as "any and all" whenever one or more than one item would be applicable for completion of the Work.
- § 1.1.11.3 Except as otherwise explicitly provided, the words "approved" or "approval" shall mean the written approval of the Architect or the Construction Manager, or both.
- § 1.1.11.4 "Accepted," "directed," "permitted," "requested," "required," and "selected" are used herein as term connections and unless specifically noted otherwise are to mean "accepted by the Architect," "directed by the Architect," "permitted by the Architect," "requested by the Architect," "required by the Architect," and "selected by the Architect." However, no such implied meaning will be interpreted to extend the Architect's responsibility into the Contractor's areas of construction supervision.
- § 1.1.11.5 The term "as indicated" or "as shown" shall mean "as indicated in the Contract Documents."
- § 1.1.11.6 The term "include" in any form other than "inclusive" is non-limiting and not intended to mean "all inclusive."
- § 1.1.11.7 The terms "furnish" and "furnish all materials," unless specifically noted otherwise, mean "pay for, supply and deliver to the job site all new materials, systems, equipment, product, and/or other items so specified."
- § 1.1.11.8 The terms "install" and "furnish all labor," unless specifically noted otherwise, mean "pay for, perform all operations connected with installation of Work including unloading new product to be installed, supplying all necessary equipment and rigs to do the Work, test, place in operation and service, and remove all packing material."
- § 1.1.11.9 The term "product" includes materials, systems, equipment, and other items to be incorporated into the Work.
- § 1.1.11.10 The term "provide," unless specifically noted otherwise, means "furnish new, install, connect up, complete, test and place in operation and service."
- § 1.1.11.11 The term "replace" or similar term shall mean "restore," "renew," "make good," "reconstruct," or "as applicable using new product."
- § 1.1.11.12 The term "concealed" as used herein shall mean items hidden from sight in such locations as trenches, chases, shafts, furred spaces, walls, slabs, above ceilings and where in sight in crawl spaces or service tunnels.

- §1.1.11.13 The term "exposed" as used herein shall mean not "concealed" as defined herein and the spaces behind normally closed doors such as interiors of cabinets.
- § 1.1.11.14 The terms "manufacturer" or "supplier" mean any person or entity which contracts to furnish materials to a Contractor, Subcontractor, or any Sub-subcontractor for use at the site of the Project.
- § 1.1.11.15 "Wiring" shall be understood to mean wires or cables with conduit, fittings, boxes, etc., installed complete.
- § 1.1.11.16 "Piping" shall be understood to mean all pipes, fittings, nipples, valves and all accessories connected thereto.
- § 1.1.11.17 The Contract Time is the period of time specified in Article 3 of the Agreement for completion of the Work.
- § 1.1.11.18 "Project Manual" is a volume assembled for the Work that includes the Instructions to Bidders, General Conditions, Supplementary General Conditions, the Specifications, and all Addenda issued prior to execution of the Contract. The Project Manual will additionally include bidding requirements and documents and sample forms.
- § 1.1.11.19 Terms not otherwise defined herein shall have the meanings set forth elsewhere in the Contract Documents.

§ 1.2 Correlation and Intent of the Contract Documents

- § 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. It is intended that all plumbing, mechanical, electrical, and other systems will be complete and in proper operation, and that all construction components, whether part of such systems or otherwise, will be complete and in compliance with accepted construction practice upon completion of the Work. Even if items are missing from the Drawings or Specifications, but are normally required for proper operation of plumbing, mechanical, electrical, and other systems, or to complete otherwise incomplete construction, or to meet governing code requirements, they shall be included by the Contractor, unless he sought and received contradictory interpretation or clarification from the Architect.
- § 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.
- § 1.2.1.2 The Contractor and its Subcontractors shall evaluate and satisfy themselves as to the conditions and limitations under which the Work is to be performed, including without limitation (1) location, layout, and nature of the Project site and surrounding areas, (2) generally prevailing climatic conditions, (3) anticipated labor supply and costs, (4) availability and cost of materials, tools, equipment, (5) Owner occupancy requirements and constraints, (6) site safety logistics plan and any phased construction plan and (7) other similar issues. The Owner assumes no responsibility or liability for the physical condition or safety of the Project site or any improvements located on the Project site. The Contractor shall be solely responsible for providing a safe place for the performance of the Work. No adjustments will be made in either the Contract Sum or Contract Time for any failure by the Contractor or any Subcontractor to comply with the requirements of this Section 1.2.1.2.
- § 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade. Instructions and other information furnished in the Specifications including, without limitation, items in connection with prefabricated or prefinished items, are not intended to supersede work agreements between employers and employees. Should the Specifications conflict with such work agreements, the work agreements shall be followed, provided such items are provided and finished as specified in the Contract Documents.

If necessary, such work shall be performed on the Project site, instead of at the shop, by appropriate labor and in accordance with the requirements of the Drawings and Specifications.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.2.4 In the event of inconsistencies within or between parts of the Contract Documents or between the Contract Documents and applicable standards, codes and ordinances, the Contractor shall (1) provide the better quality or greater quantity of work or (2) comply with the more stringent requirements; either or both in accordance with the Architect's interpretation. Where the Contractor perceives a conflict, it shall inform the Architect and Owner thereof and request a decision from the Architect, which shall be promptly communicated by the Architect to the Contractor so as not to cause any delay in the performance of the Work. Any Work performed after perceiving the conflict and prior to resolution by the Architect shall be at the Contractor's risk. The terms and provisions of this Section 1.2.4, however, shall not relieve the Contractor of any of the obligations set forth elsewhere herein.

- The Contractor shall not scale Drawings. Dimensions on large scale drawings take precedence over dimensions on small scale drawings. The Contractor shall notify the Architect if additional dimensions are needed. The Contractor shall field verify all dimensions.
- Before ordering any materials or doing any work, the Contractor and each Subcontractor shall verify measurements at the Project Site and shall be responsible for the correctness of such measurements. The Contractor shall confirm all dimensions by field measuring. No extra charge or compensation will be allowed on account of differences between actual dimensions and the dimensions indicated on the Drawings. Any difference that may be found shall be submitted to the Architect for resolution before proceeding with the Work.
- .3 If a minor change in the Work is found necessary due to actual field conditions, the Contractor shall submit detailed drawings of such departure for the approval by the Architect before making the change.
- Certain portions of the Specifications are written in condensed outline form and omitted words are to be supplied by inference. Naming of an article or operations shall have the effect of stating "Contractor shall furnish, install and complete" said operation or article unless it is further qualified in the context in which it appears.
- .5 When reference is made to specifications of a manufacturer, trade association, governmental agency, reference standard or similar source (such as ASTM, ASA, AISC, ACI, etc.) such is made part of the Drawings and Specifications, having the force and effect as though reproduced therein, and upon entering into the Contract the Contractor acknowledges his familiarity with those pertaining to its Work. Furthermore, all Work mentioned or indicated in the Contract Documents shall be performed by the Contractor as part of the Contract unless it is specifically indicated in the Contract Documents that such work is to be done by others. All Work shall conform to the National Electric Code, New York State Uniform Fire Prevention and Building Code, and amendments thereto, New York State Energy Conservation Construction Code, State Education Department Manual of Planning Standards, New York State Department of Transportation, Office of Engineering, Standard Specification, Construction and Materials, latest edition, Life Safety Code - NFPA, and applicable City and State Building Codes and Authorities having jurisdiction. The date of the reference standard shall be the latest edition at the time of signing the Contract except as specifically indicated otherwise.
- The Contract Drawings are intended to show the general arrangement, design, and extent of the Work and are partly diagrammatic. They are not intended to be scaled for any purpose, or to serve as shop drawings. The Contractor and its Subcontractors will cooperate with all other contractors and their respective subcontractors in determining the construction of systems, running of pipe, and locating equipment. The Contractor agrees that the failure to repeat typical details, figures, or notes on all Contract Drawings or other Contract Documents will not be a basis for claims for additional cost or time.
- .7 Any necessary variations in routing or installation shall be made to conform to the intent of the Contract Documents without additional costs. Where there are intersections or obstructions involving ducts, piping, or any other equipment requiring offset of materials, the Contractor acknowledges that it gave particular consideration to clearances in advance of submitting its bid, and that no additional costs for these issues will be considered by the Owner.
- 8. If conflicting conditions or interferences develop, the Contractor and its Subcontractors will confer with the other contractors and their respective subcontractors whose work is affected to determine a

- solution acceptable to all interested parties. The suggested solution shall be submitted to the Architect for comment and, if necessary, written approval.
- The Contract Documents intend a first class finished product of such character and quality as described in and reasonably inferred from the Contract Documents. The Contractor will perform its Work to be complete and operable, fitting with the work of other contractors and the Owner, and in compliance with best construction practices and the ordinances, codes, and regulations of all bodies or persons having governmental or regulatory authority over the Contractor and its Work.
- § 1.2.5 Execution of the Contract by the Contractor is a representation that the Contractor has carefully examined the Contract Documents and the Project site, and represents that the Contractor is thoroughly familiar with the nature and location of the Work, the Project site, the specific conditions under which the Work is to be performed, and all matters which may in any way affect the Work or its performance. The Contractor further represents that as a result of such examinations and investigations, the Contractor thoroughly understands the Contract Documents and their intent and purpose, and is familiar with all applicable codes, ordinances, laws, regulations, and rules as they apply to the Work, and that the Contractor will abide by same. Claims for additional time or additional compensation as a result of the Contractor's failure to follow the foregoing procedure and to familiarize itself with all conditions and the Contract Documents will not be permitted.
- § 1.2.5.1 The Contractor certifies that it is experienced and familiar with the requirements and conditions imposed during the construction of similar work in the area. This includes, but is not limited to, "out of sequence" or "come back" work for the removal of plant, equipment, temporary wiring or plumbing, etc. This "out of sequence" work may also include phasing of construction activities to accommodate the installation of the Work at various locations and orderly fashion and the completion of Work at various locations or levels at various times. This "phasing," "out of sequence," or "come back" work shall be done at no cost to other Contractors, the Owner or Architect.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

- § 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, sub-subcontractors, and suppliers do not own and cannot claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.
- § 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.
- § 1.5.3 The Contractor may not reproduce the Contract Documents in whole or in part for use as shop drawing backgrounds without the prior written consent of the Architect. If consent is given, the Architect shall determine the extent that the Contract Documents may be used in the preparation of shop drawings, as well as the fee that the Architect will be paid, if any and in the Architect's sole discretion, by the Contractor for such use of copyrighted documents.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be in writing and given, serviced or made (1) by depositing the same in the United States mail addressed to the authorized representative as specified in the Contract (or if no representative is specified to such party at the address stated in the Contract) of the party to be notified, postpaid and registered or certified with return receipt requested, (2) by depositing the same for overnight delivery (prepaid or billed to the party giving notice) with a nationally recognized overnight delivery service (e.g. Federal Express, USPS, UPS, etc.) addressed to the authorized representative of the party to be notified (or if no representative is specified to such party at the address stated in the Contract) or (3) by delivering the same in person to the said authorized representative of the party (or if no representative is specified to such party at the address stated in the Contract). Notices may be made by the party giving the notice by the party's counsel, the authorized representative of the party as specified in the Contract, or by an officer of the party that has authority to bind the party. Notices are to be sent to the designated representative of the party specified in the contract, when there is such designation, at address stated in the Contract. Notice deposited in the mail in accordance with this Section 1.6.1 shall be effective unless otherwise stated in the Contract from and after the fourth (4th) day following the date deposited in a U.S. mail receptacle or when actually received by the party to whom addressed, whichever is earlier. Notices transmitted by overnight delivery shall be effective the first business day (excludes holidays, Saturdays and Sundays) following the day of deposit with the nationally recognized overnight delivery service or when actually received by the party to whom addressed, whichever is earlier. Notice given by delivery in person shall be effective only if and when received by the party to be notified. By giving the other parties at least seven (7) days written notice thereof, the Contractor, Owner, Construction Manager and Architect have the right to change their respective designee and respective address to any address in the United States of America for receipt of notices.

§ 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 E203TM-2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203TM—2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202TM–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Construction Manager and the Architect do not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights.

§ 2.1.3 The Owner, Architect or Construction Manager shall not supervise, direct or have control or authority over, nor be responsible for, the Contractor's means, methods, techniques, sequences or procedures of construction or the safety precautions and programs incident thereto, or for any failure of the Contractor to comply with laws and regulations applicable to the furnishing or performance of the Work. The Owner, Architect and Construction Manager shall not be responsible for the Contractor's failure to perform or furnish the Work in accordance with the Contract Documents.

§ 2.2 Evidence of the Owner's Financial Arrangements – Intentionally Omitted.

(Paragraphs deleted)

§ 2.3 Information and Services Required of the Owner

- § 2.3.1 All permits and fees, approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities are the responsibility of the Contractor under the Contract Documents with the exception of the building permit, which the Owner will obtain from the New York State Education Department. The Contractor shall furnish the Construction Manager with original copies of all permits prior to the commencement of the work, and shall prominently display a copy of all permits at a location approved by the Construction Manager.
- § 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.
- § 2.3.3 The Owner shall retain a construction manager adviser lawfully practicing construction management in the jurisdiction where the Project is located. That person or entity is identified as the Construction Manager in the Agreement and is referred to throughout the Contract Documents as if singular in number.
- § 2.3.4 If the employment of the Construction Manager or Architect terminates, the Owner shall employ a successor construction manager or architect whose status under the Contract Documents shall be that of the Construction Manager or Architect, respectively.
- § 2.3.5 The Owner shall make available for inspection, upon request, that field survey or testing information of existing conditions that is known to be available and that is held by the Owner at its offices. Such records and documents are not Contract Documents, and the Owner makes no representation as to their accuracy or completeness. Notwithstanding the foregoing, information furnished by the Owner in the form of surveys, subsurface investigation reports, soil borings, and other material of a similar nature, is for general information only and is not a guarantee of the completeness or accuracy of such information, unless specifically noted otherwise herein. The Contractor shall verify all existing grades, conditions, and dimensions of existing physical conditions and structures and shall report any inconsistencies in writing to the Architect. The Contractor shall establish all lines and levels required to execute the Work and shall bear all costs involved, and shall be responsible for their accuracy and maintenance.

§ 2.3.6 Intentionally omitted.

- § 2.3.7 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one (1) set of Contract Drawings and Project Manuals for use during construction for their own use and for purposes of making reproductions pursuant to Section 1.5.2. The Owner shall furnish additional sets upon a Contractor's written request. Such additional sets will be provided at the cost of printing, postage and handling. Partial sets will not be provided. Subcontractors and other entities desiring copies of Drawings will be provided sets at the cost of printing, postage and handling.
- § 2.3.8 The Owner shall forward all communications to the Contractor through the Construction Manager. Other communication shall be made as set forth in Section 4.2.6.

§ 2.4 Owner's Right to Stop the Work

If the Contractor (1) fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2, or (2) fails to carry out Work in accordance with the Contract Documents as determined by the Owner, Architect or Construction Manager, or (3) fails or refuses to provide a sufficient amount of properly supervised and coordinated labor, materials, or equipment so as to be able to complete the Work within the Contract Time, or (4) fails to remove and discharge (within seven (7) days) any lien filed upon Owner's property by anyone claiming by, through, or under the Contractor, or (5) fails to perform the Work in a safe manner and in compliance with all applicable health and safety requirements and the Contractor's site specific health and safety plan or (6) disregards the instructions of the Architect, Owner or Construction Manager, as determined by the Owner, Architect or Construction Manager, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity. Such order or stoppage by the Owner shall not constitute grounds for termination by the Contractor under Article 14 and shall not be a basis for an extension of the Contract Time under Section 8.3 or Article 15.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents (including but not limited to all applicable health and safety requirements) and fails within a three-day period after receipt of notice from the Owner, Architect or Construction Manager to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, after such three (3) day period and without prejudice to other remedies the Owner may have, correct such default or neglect at Contractor's expense. The Owner's reasonable cost of correcting such default or neglect shall be deducted from payments due the Contractor by Change Order, Construction Change Directive, back charge or other means. The Construction Manager or Architect may, pursuant to Section 9.5.1, withhold, modify and/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. The Owner's reasonable costs shall include the cost of labor and materials to complete the correction of such default or neglect, the 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, and, without limitation, the Owner's reasonable attorney's fees, including attorney's fees incurred in the course of enforcing Owner's rights under this provision. If current and future payments due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

§ 2.5.1 Where the Contractor's default and/or neglect to carry out its Work in accordance with the Contract Documents threatens the health, safety and/or welfare of the occupants of the Owner's facilities and/or threatens the structural integrity and/or preservation of the Owner's facilities, the Owner may proceed to carry out the Contractor's Work upon twenty-four (24) hours' notice of its intention to do so to the Contractor. In such case an appropriate Change Order or Construction Change Directive shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies and defaults, including the Owner's expenses and compensation for the Architect's and its respective consultants' additional services and other expenses made necessary by such default, neglect or failure.

§ 2.6 Extent of Owner's Rights

- § 2.6.1 The rights stated in this Article 2 and elsewhere in the Contract Documents are cumulative and not in limitation of any rights of the Owner (1) granted in the Contract Documents, (2) at law or (3) in equity.
- § 2.6.2 In no event shall the Owner, Architect or Construction Manager have any responsibility for the Contractor's construction means, methods, techniques, sequences or procedures or for safety precautions and programs in connection with the Work notwithstanding any of the rights and authority granted the Owner in the Contract Documents.

ARTICLE 3 CONTRACTOR

§ 3.1 General

- § 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.
- § 3.1.2 The plural term "Multiple Prime Contractors" when used herein refers to persons or entities who perform construction under contracts with the Owner that are administered by the Construction Manager. The term does not include the Owner's own forces, including persons or entities under separate contracts not administered by the Construction Manager.
- § 3.1.3 The Contractor shall perform the Work in accordance with the Contract Documents.
- § 3.1.4 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Construction Manager or Architect in their administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

The Contractor shall maintain complete inspection records and test date to ensure the quality of the Work is in strict compliance with the requirements of the Contract Documents.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

- § 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.
- § 3.2.1.1 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the Contract Documents relative to that portion of the Work, as well as with information furnished by the Owner pursuant to Section 2.3.5, shall take field measurements of any existing conditions related to that portion of the Work, shall observe any conditions at the site affecting it, and shall at once report in writing to the Construction Manager and the Architect errors, inconsistencies or omissions discovered. The Contractor shall not be liable to the Owner, the Construction Manager or the Architect for damage resulting from errors, inconsistencies or omissions in the Contract Documents unless the Contractor knew or reasonably should have known of such error, inconsistency or omission and failed to report it as required by this section to the Construction Manager and the Architect. If the Contractor performs any construction activity knowing it involves, or reasonably should have known it involves, a recognized error, inconsistency or omission in the Contract Documents without such notice to the Construction Manager and the Architect, the Contractor shall assume full responsibility for such performance and shall bear sole responsibility for the costs for correction.
- § 3.2.1.2 The obligations of the Contractor under Section 3.2.1.1 and this Section 3.2.1.2 are for the purpose of facilitating construction by the Contractor and are not for the purpose of imposing an affirmative obligation on the Contractor to discover errors, omissions, or inconsistencies in the design information in the Contract Documents. The Contractor's review of the Contract Documents is made in the Contractor's capacity as a contractor and not as a licensed design professional unless otherwise specifically so provided in the Contract Documents.
- § 3.2.1.3 Failure by the Contractor to promptly report any errors, inconsistencies, or omissions in the Contract Documents discovered by the Contractor, or which the Contractor reasonably should have known or discovered, shall constitute a waiver by the Contractor of any claim that otherwise might result in a change in the Contract Sum or Contract Time.
- § 3.2.1.4 The representations of the Contractor as set forth in these General Conditions shall survive expiration or termination of the Agreement.
- § 3.2.2 The Contractor shall be presumed to have examined the Project site(s) to consider fully all conditions that may have a bearing on the Work and to have accounted for these conditions its proposal. The Contractor is deemed to be a qualified expert in the systems and construction requirements of the Work of its Contract. The Contractor hereby specifically acknowledges and declares that the Contract Documents are full and complete, are sufficient to have enabled it to determine the cost of the Work, and that the Drawings, the Specifications, and all Addenda are sufficient to enable the Contractor to construct the Work outlined therein in accordance with applicable laws, statutes, building codes, and regulations, and otherwise to fulfill all of its obligations under the Contract Documents. The Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents before commencing activities. Errors, inconsistencies or omissions discovered shall be reported to the Construction Manager and the Architect at once. The exactness of grades, elevations, dimensions, or locations given on any Drawings issued by the Architect, or the work installed by other Contractors, is not guaranteed by the Architect, Construction Manager or the Owner. The Contractor shall, therefore, satisfy itself as to the accuracy of all grades, elevations, dimensions, and locations. In all cases of interconnection of its Work with existing or other work, the Contractor shall verify at the site all dimensions relating to such existing or other work. Any errors due to the Contractor's failure to so verify all such grades, elevations, dimensions, or locations shall be promptly rectified by the Contractor without any additional cost to the Owner. Except as to any reported errors, inconsistencies or omissions, and except as to concealed or unknown conditions, by executing the Agreement, the Contractor represents to the Owner, Construction Manager, and the Architect that the Work required by the Contract Documents, including, without limitation, all construction details, construction means, methods, procedure and techniques necessary to perform the Work, use of materials, selection of equipment and requirements of product manufacturers are consistent with: (1) good and sound practices within the construction industry; (2) generally prevailing and accepted industry standards applicable to Work; (3) the

requirements of any warranties applicable to the Work; and (4) all laws, ordinances, regulations, rules and orders which bear upon the Contractor's performance of the Work.

- § 3.2.3 The Contractor shall perform the Work in accordance with the Contract Documents and submittals approved pursuant to Section 3.12.
- § 3.2.4 The Contractor may submit Requests for Information ("RFI") to the Architect to help facilitate the Contractor's performance of the Work. Prior to submitting each RFI, the Contractor shall first carefully study and compare the Contract Documents, field conditions, other Owner provided information, Contractor-prepared Coordination Drawings, and prior Project correspondence and documentation to determine that the information to be requested is not reasonably obtainable from such sources. The Contractor shall submit each RFI sufficiently in advance of the date by which such information is required in order to allow the Architect sufficient time to permit adequate review and response and to permit Contractor compliance with the latest construction schedule. The Contractor shall reimburse the Owner amounts charged by the Architect for RFI responses that in the opinion of the Architect were available from a careful review of the Contract Documents, field conditions, other Owner provided information, Contractor-prepared Coordination Drawings, and prior Project correspondence and documentation.
- § 3.2.4.1 RFIs are for requests on clarifications or questions on Drawings and Specifications, not Contract terms, scheduling items, or general correspondence, nor, as a means to describe or request approval of alternate construction means, methods or concepts or substitution or materials, systems means and methods. The Contractor shall fill all RFIs out in accordance with the provisions of the Project Manual. Neither the Architect nor the Construction Manager shall fill said forms out on the Contractor's behalf.
- § 3.2.5 If the Contractor, during the progress of the Work, discovers any discrepancies between the Drawings and the Specifications, errors and/or omissions on the Drawings, or any discrepancies between physical conditions of the Work and the Drawings, and has notified the Architect and Construction Manager in writing under Section 3.2.1, no deviations from the Contract Documents shall be performed by the Contractor until it receives approval in writing from the Architect through the Construction Manager. Any Work performed after such discovery without the approval of the Architect shall be at the Contractor's sole risk and expense.
- § 3.2.6 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Construction Manager and the Architect any nonconformity discovered by or made known to the Contractor as a RFI submitted to the Architect.
- § 3.2.7 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or RFIs pursuant to Sections 3.2.1, 3.2.2, 3.2.4, 3.2.5 or 3.2.6, the Contractor shall make a Claim as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.1, 3.2.2, 3.2.4, 3.2.5 or 3.2.6, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or the Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.
- § 3.2.8 The Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of Owner. The Contractor shall report to the Construction Manager and Architect whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points by professionally qualified personnel.
- § 3.2.8.1 The Contractor shall be required to establish centerlines, elevations and location of his work when it is required for the benefit of other Contractors needing the information to coordinate location of their work.
- § 3.2.9 Whenever the Drawings show existing or other construction not required as part of the Contract Work, it is understood that it is so shown as a matter of information and that the Owner, while believing such information to be

substantially correct, assumes no responsibility thereof. The Contractor shall make itself familiar with all conditions affecting the nature and manner of conducting the Work.

- § 3.2.10 Claims for additional compensation or extension of time due to the Contractor's failure to familiarize itself with the conditions at the Project site will not be allowed.
- § 3.2.11 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for evaluating and responding to the Contractor's requests for information that are not prepared in accordance with the Contract Documents or where the requested information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.

§ 3.3 Supervision and Construction Procedures

- § 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention, and shall complete the Work in a good and workmanlike manner in accordance with the Contract Documents. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work subject to the coordination of the Construction Manager. Where the Drawings or Project Manual make reference to particular construction means, methods, techniques, sequences or procedures or indicate or imply that such are to be used in connection with the Contractor's Work, such reference is intended only to indicate that the Contractor's Work is to produce at least the quality of the work implied by the operations described, but the actual determination as to whether or not the described operations may be safely or suitably employed in the performance of the Contractor's Work shall be the sole responsibility of the Contractor. All loss, damage, liability, or cost of correcting defective Work arising from the employment of a specific construction means, method, technique, sequence, or procedure shall be borne solely by the Contractor.
- § 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors, Suppliers, and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors, Suppliers or Sub-subcontractors, and for any damages, losses, costs and expenses resulting from such acts or omissions, including but not limited to reasonable attorneys' fees.
- § 3.3.3 The Contractor shall be responsible for coordinating the work of its own forces and the work of Subcontractors engaged by it to perform the Work of the Project on its behalf. The Contractor shall supply to its own work forces, and Subcontractors engaged by it to perform portions of its Work, copies of the Drawings and Project Manuals for the work to be performed by such individuals/entities on its behalf. The Contractor shall be responsible to the Owner for the acts or omissions of the Contractor's employees, the Contractor's Subcontractors, the Contractor's material suppliers, their respective agents and employees, and any other persons performing portions of the Work on behalf of the Contractor.
- § 3.3.3.1 The Contractor shall coordinate its operations and cooperate with those of other Contractors performing work on the Project or site thereof to ensure efficient and orderly installation of each part of the Work. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the Work. The Contractor shall remain informed of the progress and the detail work of other Contractors and shall notify the Construction Manager immediately of lack of progress or defective workmanship on the part of other Contractors, where such delay or such defective workmanship will interfere with Contractor's own operations. Failure of the Contractor to keep informed of the work progressing on the site or to give notice of lack of progress or defective workmanship by others shall be construed as acceptance of the progress of work and coordination with Contractor's own Work.
- § 3.3.3.2 The Contractor's obligations under the Contract Documents shall include, without limitation, the following:
 - Review of all specified construction and installation procedures with its employees and/or Subcontractors, including, without limitation, those recommended by manufacturers, prior to the commencement of the relevant portion of the Work to be performed.
 - .2 Advising the Construction Manager and the Architect:
 - .1 if a specified procedure deviates from best construction practice;
 - .2 if following a procedure will affect any warranties, including the Contractor's general warranty; or

- of any objections the Contractor may have to a procedure.
- .3 Proposing alternative procedures, as appropriate, which procedures shall be covered by the Contractor's warranty as described in Section 3.5 hereof.
- .4 The Contractor shall be responsible for organizing and conducting pre-installation conferences and must coordinate such conferences with the Architect and the Construction Manager.
- § 3.3.3.3 The Contractor and its Subcontractors working on the Project shall attend a preconstruction conference(s) or meeting(s) as deemed necessary by the Construction Manager to coordinate all Work (e.g., demolition, installation, etc.), and as required by the Project Manual.
- § 3.3.4 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Construction Manager or the Architect in their administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor. The Contractor shall maintain complete inspection records and test date to ensure the quality of the Work is in strict compliance with the requirements of the Contract Documents.
- § 3.3.5 Where equipment lines, piping, ductwork, and/or conduit are shown diagrammatically, the Contractor shall be responsible for the coordination and orderly arrangement of the various lines of piping and conduit included in the Work of its Contract. The Contractor shall coordinate the work of its Subcontractors and prevent all interferences between or among equipment, lines of piping, and architectural features, and avoid any unsightly arrangements in exposed areas. This Section shall not be construed as limiting any obligation of the Contractor under any other provision of the Contract Documents.
- § 3.3.6 The Contractor shall be responsible for inspection of portions of the Project already performed to determine that such portions are in proper condition to receive subsequent Work.
- § 3.3.7 The Contractor, its employees and Subcontractors, shall be subject to such rules and regulations for the conduct of Work as the Owner may establish, including but not limited to, the Construction Rules and Regulations set forth in Section 3.13.4. The Contractor shall be responsible for the enforcement among its employees of the Owner's instructions.
- § 3.3.8 The Contractor shall inspect all materials as delivered to the Project site and shall reject any materials that will not conform with the requirements of the Contract Documents when properly installed.
- § 3.3.9 The Contractor shall be responsible for and coordinate any and all inspections required by any governmental 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 therefore. In addition, any additional costs and expenses of any nature incurred by the Owner as a result of the Contractor's failure to conform to this requirement shall constitute a charge against the Contractor's Contract.
- § 3.3.10 Shutdowns: Such work as connections to existing sewers, plumbing, heating, and electrical systems shall be coordinated at a time agreeable to the Owner, the Architect, and the Construction Manager, and shall be determined and agreed to well in advance of the actual performance of such work so as to interfere as little as possible with the operation and use of the Owner's existing facilities. Shutdowns must be coordinated through the Construction Manager. The continued uninterrupted operation of all facilities of the Owner's buildings is essential. If any existing facilities must be interrupted, the Contractor for the Work shall provide all necessary temporary facilities and connections necessary for maintaining these existing facilities at no increase in the Contract Sum except as otherwise specified. No mechanical, heating, plumbing, sprinkler, or electric service shall be interrupted at any time except as approved in advance by the Owner or when the buildings are not occupied and shall be coordinated with the Owner, as well as the Construction Manager. All communication systems must be maintained without interruption. As much related work as possible shall be performed prior to shutdowns, so as to minimize the period of shut down. All material, equipment, and manpower necessary in the performance of a shutdown shall be on site prior to interruption of service.

§ 3.4 Labor and Materials

- § 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor (at applicable prevailing wage rates), materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. All materials provided by Contractor shall be new. The Contractor shall work continuously and expeditiously through completion of the Work. Time is of the essence.
- § 3.4.1.1 Notwithstanding any other provision of the Contract Documents, the Contractor shall perform at least twenty-five (25%) percent of the field work with its own full-time employees. For the purpose of the preceding sentence any part of the work performed by supervisory personnel (persons above level of foreman) or by office personnel shall not be considered part of the Work performed by the Contractor's employees. Such items as bonds, certificates, shop drawings and similar items are not to be counted as satisfying the twenty five (25%) percent requirement.
- § 3.4.1.2 A shortage of labor in the industry shall not be accepted as an excuse for not properly manning the Project at each site.
- § 3.4.1.3 The Contractor shall be responsible for the care and protection of all equipment and materials for its Work on the Project, including equipment and material furnished by the Owner.
- § 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect, in consultation with the Construction Manager, and in accordance with a resulting Change Order or Construction Change Directive.
- § 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them, or persons who within the last two weeks (a) having been exposed to someone having been diagnosed with a COVID-19 infection; or (b) having had a persistent cough, shortness of breath, or a fever of 100.4 or higher. The Owner reserves the right to have any persons removed from the Project upon reasonable objection.
- § 3.4.3.1 In addition to all other safety requirements, the Contractor shall provide suitable and a sufficient number of safety related facilities and personal protective equipment (PPE) at the site related to protection against the spread of COVID-19, including but not limited to handwashing stations, hand sanitizer, gloves, masks, faceshields, and other equipment as the Owner may reasonably request. Notwithstanding the foregoing, nothing herein shall be construed to delegate or relieve Contractor from having sole and exclusive responsibility for all worksite safety.
- § 3.4.4 All mechanics employed on the Project shall be persons skilled in that work which they are to perform. Work will not be approved if it does not meet the quality of workmanship as called for in the Contract Documents. If this quality of workmanship is not exactly defined herein, it shall be assumed to be the best standards of workmanship for the trade.
- § 3.4.5 Employees of the Contractor or its Subcontractors whose work is unsatisfactory to the Owner, Construction Manager or Architect, or considered by them to be unskilled or otherwise objectionable, will be immediately dismissed from the Project upon notice from the Construction Manager. Those dismissed employees shall be immediately replaced by the Contractor so as not to delay progress of the Work and at no additional cost to the Owner.
- § 3.4.6 On receipt of the signed Contract, the Contractor will be expected to place firm orders with vendors for needed materials, including Subcontractors and major material suppliers. If deemed necessary to assure delivery of materials at times needed, the Contractor may accept delivery of such materials at any time, and may include the cost of such materials in its next monthly Application for Payment, provided such materials have actually been delivered to Contractor and properly stored by it with approval or under direction of the Architect and the Construction Manager either at the Project site or in an approved storage shed or warehouse, as provided elsewhere in these General Conditions.

- § 3.4.6.1 To the fullest extent possible, the Contractor shall provide products of the same kind, from a single source. When two or more items of same material or equipment are required (pumps, valves, air conditioning units, etc.) they shall be of the same manufacturer. Product manufacturer uniformity does not apply to raw materials, bulk materials, pipe, tube, fittings (except flanged and grooved types), sheet metal, wire, steel bar stock, welding rods, solder, fasteners, motors for dissimilar equipment units, and similar items used in the work, except as otherwise indicated. The Contractor shall provide products which are compatible within systems and other connected items. If Contractor is given option of selecting between two or more products for use on the Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.
- § 3.4.6.2 The Contractor is responsible for providing products and construction methods compatible with products and construction methods of other Contractors. If a dispute arises between the Contractor and other Contractors over concurrently selectable but incompatible products, the Architect will determine which products shall be used.
- § 3.4.6.3 With respect to sitework materials, all products submitted for use and incorporated into the Project shall be on the Approved List of Materials and Equipment published by the NYSDOT Materials Bureau, most recent edition.
- § 3.4.6.4 When required, off-site storage shall be the responsibility of the Contractor. If materials are stored off site, the Contractor shall furnish proof of title by Owner and provide a certificate of insurance demonstrating adequate insurance coverage.
- § 3.4.6.5 The Contractor shall deliver all materials at such times as will ensure speedy and uninterrupted progress of the Work.
- § 3.4.6.6 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them The Owner reserves the right to object to Contractor's use of persons who appear unfit or not skilled in the tasks assigned to them. Should any disorderly, incompetent, unfit, unskilled or objectionable person be hired or employed by the Contractor, upon or about the Premises of the Owner, for any purpose or in any capacity, they shall, upon request of the Owner, be removed from the Project and not again be assigned thereon without the written permission of the Owner.
- § 3.4.7 The Contractor warrants that it has good title to all materials used by it in, on or in connection with the Work. No materials or supplies shall be purchased by the Contractor or any of its Subcontractors that are subject to any chattel mortgage, conditional sale, or other agreement by which an interest is retained by the seller.
- § 3.4.8 The Contractor shall make every reasonable effort to avoid labor disputes and to insulate the Owner, Architect and Construction Manager from the effects of labor disputes should any arise. There shall be no strikes, picketing, work stoppages, slowdowns, or other disruptive activity at the Project for any reason by anyone employed or engaged by the Contractor to perform its portion of the Work. There shall be no lockout at the Project by the Contractor. The Contractor shall be responsible for providing the manpower required to proceed with the Work under any circumstance. For the purposes of this Section, every reasonable effort shall include, but not necessarily be limited to:
 - 1 make all necessary arrangements to reconcile, without delay, damage or cost to the Owner and without recourse to the Architect, the Construction Manager or the Owner, any conflict between its Agreement with the Owner and any agreements or regulations of any kind at any time in force among members or councils which regulate or distinguish what activities shall not be included in the work of any particular trade;
 - .2 requiring employees, Subcontractors, suppliers and others to use reserve gates which shall be established for the Project;
 - .3 rearranging work schedules for the Contractor's Work or the work of its Subcontractors; and
 - .4 including in Contractor's agreements with its Subcontractors the right to fully implement all provisions of this Section.
- § 3.4.8.5 In case the progress of the Work is effected by any undue delay in furnishing or installing any items or materials or equipment required pursuant to the Contract because of a conflict involving any such labor agreement or regulation, the Owner may require that other material or equipment of equal kind and quality be provided pursuant to a Change Order or Construction Change Directive but in no case shall the amount of such change be charged by the Contractor to the Owner as an additional cost to perform the Work.

- § 3.4.8.5.1 No extension of the Contract Time shall be granted for delays caused by labor or material disputes.
- § 3.4.8.5.2 Should it become necessary to create a separate entrance for a Contractor involved in a dispute, all costs associated with creating that entrance shall be borne by the Contractor involved in the dispute. Such costs shall include, but not limited to signage, fencing, temporary roads and security personnel as deemed necessary by the Owner for the safety of the occupants of the site.
- § 3.4.8.6 The Contractor shall ensure that its Work continues uninterrupted during the pendency of a labor dispute.
- § 3.4.8.7 The Contractor shall be liable to the Owner for all damages suffered by the Owner occurring as a result of work stoppages, slowdowns, disputes or strikes arising from the labor practices of the Contractor or its Subcontractors, Suppliers or Sub-subcontractors.
- § 3.4.9 The Contractor and its Subcontractors employed upon the Work shall abide by and conform with all labor laws and to all other laws, ordinances, and legal requirements now or hereafter applicable to the Work and the construction area.
- § 3.4.10 The Contractor and its Subcontractors shall be responsible for protection of the Work, the work of Separate or other Contractors, and existing construction, both on and off the site, and in the event of damage, shall restore the same to the original condition at no additional cost to the Owner.
- § 3.4.11 If the Work is to be performed by trade unions, the Contractor shall, with the consent of the Owner and the Architect, which shall not be unreasonably withheld, make all necessary arrangements to reconcile, without delay, damage, or cost to the Owner, any conflict between the Contract Documents and any agreements or regulations of any kind, at any time in force among members or councils that regulate or distinguish what activities are included in the work of any particular trade.
- § 3.4.12 No new asbestos containing building materials shall be used in construction. No materials containing asbestos in any form shall be used in, on, or around the Owner's buildings.

§ 3.4.13 Equivalents and Substitutions

- § 3.4.13.1 Equivalents. In the Specifications, one or more kinds, types, brands, or manufacturers or materials are regarded as the required standard of quality and are presumed to be equal. The Contractor may select one of these items or, if the Contractor desires to use any kind type, brand, or manufacturer or material other than those named in the Specifications, it shall indicate in writing, and prior to award of the Contract, what kind, type, brand or manufacturer is included in the base bid for the specified item. The Contractor shall follow the submission requirements for equivalents as provided in the Project Manual. Any proposed equivalent shall not be purchased or installed by the Contractor without the Architect's review process having been completed and the product accepted by written notification.
- § 3.4.13.2 Substitutions. After the Contract has been executed, the Owner, Construction Manager and Architect will consider a formal request for the substitution of products in place of those specified only under conditions set forth in the Specifications.
- § 3.4.13.3 By making said requests in conformance with procedures established herein and elsewhere in the Project Manual, the Contractor: (1) represents that it has personally investigated the proposed substitute product and has determined that it is equal to or superior in all respects to that specified; (2) represents that the warranty for the substitution will be the same, or greater than, that applicable to the specified product; (3) certifies that the cost data is complete and includes all related costs under the Contract, including professional services necessary and/or required for the Architect or its consultants to implement said substitution and waives any and all claims for additional costs related to the substitution which subsequently become apparent; (4) represents that it will coordinate the installation of the accepted substitute, making all such changes to the Drawings effected by the change, including but not limited to the electrical, plumbing, site work and heating and ventilating Specifications as may be required for the Work to be complete in all respects; and (5) represents that it will reimburse the Owner for all additional costs billed by the Architect or its consultants for the review of the substitution request(s), any redesign of the Work of this Contractor or associated contractors, additional site visits related to the substitution request and for the work to prepare Change Orders or Construction Change Directives.

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- § 3.4.13.4 Substitutions and alternates may be rejected without explanation and will be considered only under one or more of the following conditions:
 - .1 required for compliance with interpretation of code requirements or insurance regulations then existing;
 - .2 unavailability of specified products, through no fault of the Contractor;
 - .3 subsequent information discloses inability of specified products to perform properly or to fit in designated space;
 - .4 manufacturer/fabricator refuses to certify or guarantee performance of specified products as required;
 - .5 when in the judgment of the Owner, a substitution would be substantially in the Owner's best interests, in terms of costs, time or other considerations; and
 - .6 where the Contractor establishes that the substituted product is equal or better than the specified product in all respects.

§ 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 good title to all materials, supplies, and equipment installed or incorporated in the Work. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements, including substitutions not properly approved and authorized, shall be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. All warranties and guarantees specifically called for by the Contract Documents shall expressly run to the benefit of the Owner. If required by the Architect, the Contractor shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with instructions of the applicable supplier, except as otherwise provided in the Contract Documents. The Contractor shall perform the Work in strict accordance with the Contract Documents and best industry practices. The Contractor, at its expense, shall upon demand by the Owner, Construction Manager or Architect remove and replace materials not meeting specifications or materials failing to perform as represented or warranted by the manufacturer, regardless of whether incorporated into the Work. The Contractor shall promptly replace or correct any Work or materials that the Owner, Construction Manager or Architect rejects as failing to conform to the requirements of the Contract Documents. The foregoing warranty obligations shall survive completion or termination of the Contract, are not limited by the provisions of Article 12, and are in addition to and not in limitation of any other warranty, right or remedy set forth in the Contract Documents or otherwise prescribed by law.
- § 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4. The Contractor shall assign to the Owner at the time of final completion of the Work any and all manufacturer's warranties relating to materials and labor used in the Work and further agrees to perform the Work in such manner so as to preserve any and all such manufacturer's warranties. The Contractor shall fully cooperate with the Owner in the event the Owner pursues remedies under any warranties assigned to the Owner. The Contractor acknowledges that its obligations to the Owner under Section 3.5 are joint and several with its Subcontractors, suppliers, and material or equipment manufacturers of all materials and equipment supplied on account of the Work.
- § 3.5.3 No warranties or guarantees by the Contractor will deprive the Owner of any cause of action, right, or remedy otherwise available for breach of any of the provisions of the Contract Documents. Neither final payment nor provision in the Contract Documents nor partial or entire occupancy of premises by Owner shall constitute an acceptance of Work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibilities for faulty or defective materials or workmanship.
- § 3.5.3.1 The Contractor shall deliver to the Owner upon completion of all work under its Contract, its written guarantee made out to the Owner in a form acceptable to the Owner, guaranteeing (and it does so guarantee) all of the Work under the Contract to be free from faulty materials, and free from improper workmanship, and guarantees against injury from proper and usual wear and aging. This guarantee shall also be made to cover (and does cover) a

period of two (2) years from the date of Substantial Completion all work under the Contract as required by Article 12 hereof, or for a longer period where so stipulated in the Contract Documents.

- § 3.5.4 All required maintenance shall be the Contractor's responsibility until the Owner has accepted the Project as complete, all required maintenance and user's manuals have been turned over to the Owner, and the Owner's designated personnel have been instructed in the maintenance and operation of all applicable materials. This maintenance shall include a complete turnover procedure at the time of completion, including complete cleaning, testing and adjustment. The Contractor shall keep records of all such maintenance performed as required by this Section, including work performed and times and dates on which it was performed. These records shall be turned over to the Owner at closeout.
- § 3.5.5 The Contractor shall in case of work performed by its Subcontractors, and where guarantees are required, secure warranties from Subcontractors and deliver copies of same to the Construction Manager countersigned by the Contractor.
- § 3.5.6 Neither final payment nor provision in the Contract Documents nor partial or entire occupancy of premises by Owner shall constitute an acceptance of Work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibilities for faulty or defective materials or workmanship.

§ 3.6 Taxes

Except as otherwise specified, the Contractor shall pay sales, consumer, use and similar taxes for the Work or portions thereof provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

- § 3.6.1 The Owner is exempt from payment of federal, state, and local sales and compensation use taxes on all supplies and materials incorporated into and becoming an integral component part of the structures, buildings, or real property pursuant to this Contract. Such taxes are therefore not to be included in the Contractor's bid or the Contract Sum. The Owner shall deliver to the Contractor the appropriate exemption certificate required to be supplied by the Owner, and the Contractor and its Subcontractors and materialmen shall be solely responsible for obtaining and delivering any and all exemption or other certificates and for furnishing a Contractor Exempt Purchase Certificate or other appropriate certificates to all persons, firms, or corporations from whom they purchase supplies, materials, and equipment for the performance of the Work.
- § 3.6.1.1 The Contractor's attention is called to fact that materials not actually incorporated into Work will not be exempt from payment of sales or compensating use taxes, and the Contractor and its Subcontractor shall be responsible for and shall pay any and all applicable taxes. This will apply to such things as:
 - construction machinery and equipment including rentals or repair parts; .1
 - .2 The Contractor's office supplies;
 - .3 The Contractor's supplies, tools and miscellaneous equipment including forms, materials, and scaffolding (whether purchased or rented);
 - .4 temporary heat;
 - .5 telephone or electric services; and
 - .6 any other items purchased or rented by the Contractor for the Contractor's use in performing its Work and not incorporated into realty.
- § 3.6.2 The Contractor accepts full and exclusive liability for payment of any and all contributions, assessments or taxes for unemployment insurance or old age insurance, or annuities now or hereafter imposed by the government of the United States, or by the government of any city, county or state of United States, which are measured by salaries or other remuneration paid to persons employed by the Contractor or any Subcontractor for Work performed under this Contract.

§ 3.7 Permits, Fees, Notices, and Compliance with Laws

§ 3.7.1 The Contractor shall, as soon as practicable, furnish the Owner, Architect, and Construction Manager with copies or certificates of all permits, fees, licenses, and inspections necessary for the proper execution and completion of the Work, including, without limitation, all applicable building permits other than those required of the Owner under Sections 2.3.1. All inspection fees and other costs of such permits and licenses required to be obtained by the

Contractor as may be imposed by any municipal or other entity shall be paid by the Contractor and shall not serve as the basis for any increase in the Contract Sum.

- § 3.7.2 The Contractor shall comply with, and give notices required by, applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work. If the Contractor fails to give such notices, it shall be liable for and shall indemnify and hold harmless (a) the Owner, its consultants, employees, officers and agents and (b) the Architect, Construction Manager and their consultants, employees, officers and agents against any resulting fines, penalties, judgments, or damages, including reasonable attorney's fees, imposed on or incurred by the parties indemnified hereunder.
- § 3.7.2.1 In accordance with New York State Labor Law Article 8, Section 220, subd. 3-a(a), the Contractor shall submit to the Owner within 30 days after issuance of Contractor's first payroll, and every 30 days thereafter, a transcript of the original payroll record, subscribed and affirmed as true under the penalties of perjury.
- § 3.7.2.2 The Contractor shall comply with all applicable New York State Department of Labor requirements, including the provision that every worker employed in performance of a public work contract shall be certified as having completed an OSHA 10-hour safety training course. The Contractor and its Subcontractors shall be solely responsible for compliance with this requirement with respect to their employees. The Contractor's or Subcontractor's failure to comply with this requirement shall not transfer or in any way impose the responsibility for worker safety upon the Owner or the Architect.
- § 3.7.3 If the Contractor performs Work 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 all costs attributable to the correction thereof or related thereto, including reimbursement to the Owner for any additional services required of the Construction Manager or Architect, or both, as well as all fines and penalties, if any.
- § 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall give prompt written notice to the Owner, Construction Manager, and the Architect of such conditions before they are disturbed or affected work is performed and in no event later than three (3) business days after first observance of the conditions. The Architect or Construction Manager will promptly investigate such conditions and, if the Architect, in consultation with the Construction Manager, determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect, in consultation with the Construction Manager, determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner, Construction Manager, and Contractor in writing, stating the reasons. If the Contractor disputes the Architect's determination or recommendation, it may proceed as provided in Article 15. No adjustment in the Contract Time or Contract Sum will be permitted, however, in connection with a concealed or unknown condition that does not differ materially from those conditions disclosed or that reasonably should have been disclosed by the Contractor's (1) prior inspections, tests, and reviews, or (2) inspections, tests, and reviews the Contractor had the opportunity to make or should have performed in connection with the Project.
- § 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner, Construction Manager, and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

- § 3.8.2 Unless otherwise provided in the Contract Documents:
 - .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
 - .2 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. The Contractor is not entitled to overhead and profit on unexpended allowance amounts or any portions thereof.
- § 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

- § 3.9.1 Prior to starting the Work, the Contractor shall designate the Project Manager, a full-time Superintendent and other key individuals who shall be assigned to the Project through and including Final Completion. Such designations shall be in writing and provided to the Construction Manager, Architect and Owner and shall include the qualifications of such individuals. The Superintendent shall be in attendance at the Project site throughout the Work, remain on the Project site not less than eight hours per day, five days per week, until termination of the Contract, unless the job is suspended, work is stopped by the Owner, or no work is scheduled. The Superintendent shall be approved by the Owner in its sole discretion. Said representatives shall be qualified in the type of work to be undertaken and shall not be changed during the course of construction without the prior written consent of the Owner. Should a representative leave the Contractor's employ, the Contractor shall promptly designate a new representative. The Owner shall have the right, at any time and in its sole discretion, to direct a change in the Contractor's representatives if their performance is unsatisfactory. In the event of such a demand, the Contractor shall within seven (7) days after notification thereof, replace said individual(s) with an individual(s) satisfactory to the Owner, in the Owner's sole discretion. If said replacement is disapproved, the Contractor may, at the Owner's option, be terminated for cause. The Superintendent shall represent the Contractor, and communications given to the Superintendent shall be as binding as if given to the Contractor. The Owner shall have no obligation to direct or monitor the Contractor's employees. All references herein to the Superintendent shall be taken to mean the Contractor's superintending staff. Each Subcontractor shall designate the Project Manager, Superintendent and other key individuals who shall be assigned to the Project. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case. The Contractor's Superintendent shall attend all Project meetings, regardless of whether held prior to or following Substantial Completion of the Work.
- § 3.9.2 The Contractor shall provide, or otherwise see that, the Project Manager, or Superintendents or responsible workers of the Contractor and its major Subcontractors are equipped with cellular phones and radios. The Contractor shall provide the Owner, the Construction Manager, and the Architect with the number for each phone and worker.
- § 3.9.3 The Contractor's supervisory personnel, including Superintendents and their assistants, shall be versed in the English language. In the event the Contractor's supervisory personnel, Superintendents and their assistants are not versed in the English language, the Contractor shall employ the services of a full-time on-site interpreter to facilitate communications with such supervisory personnel.
- **§3.9.4** The Contractor shall not reduce or terminate supervision of the Work, nor change the superintendent without the prior written approval of the Owner.
- **§3.9.5** If, for any reason, the Contractor takes an action resulting in any of the changes noted in Subsection 3.9.4, the Owner may take remedial action to insure continued progress of the Work, including the hiring of suitable supervisory personnel, and charge the Contractor all costs associated with these remedial actions including the costs of legal and additional construction management and architectural services.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly, but in no event later than 14 days, after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information and the Construction Manager's approval a Contractor's construction schedule for the Work in electronic format with predecessor logic. The construction schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The Contractor's construction schedule shall provide for the orderly progression of the Work to completion, and shall not exceed time limits current under the Contract Documents. The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict with, and as to cause no delay in, the work or activities of other Multiple Prime Contractors or the construction or operations of the Owner's own forces. The Contractor's construction schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project but the Contract Time and any applicable Milestone Date shall not be changed except by fully executed Change Order.

The construction schedule shall be in a detailed precedence style critical path method (CPM) or Primavera-type format satisfactory to the Owner, the Construction Manager and the Architect which shall also:

- provide a graphic representation of all activities and events that will occur during performance of the Work including the submission, review and approval of all submittals (i.e. Shop Drawings, etc.) re-quired by the Contract Documents;
- (b) identify with each phase of construction and occupancy; and
- (c) set forth dates that are critical in insuring the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents (hereinafter referred to as the Milestone dates).

Upon review and acceptance by the Owner and the Construction Manager of the Milestone Dates, the construction schedule shall be deemed part of the Contract Documents and attached to the agreement as Exhibit "A". If not accepted by the Owner and the Construction Manager, the construction schedule shall be promptly revised by the Contractor in accordance with the recommendations of the Owner and the Construction Manager and re-submitted for acceptance.

(Paragraph deleted)

- § 3.10.1.1 Time is of the essence for this Project. The Work shall be performed continuously and without interruption, so that all Work can be completed in the time set forth in the Contract Documents. The accepted construction schedule shall be dated to reflect actual conditions (sometimes referred to as progress reports) as set forth in this Section or if requested by the Owner, Construction Manager or Architect.
- § 3.10.1.2 The sequence of the Work shall be scheduled with the Owner so as to minimize interference with the Owner's use of existing structures, and the Owner's approval shall be obtained prior to starting of the Work.
- § 3.10.1.3 The Contractor shall conform to the most recent Project Schedule, and all Work shall be completed on or before the dates established in the Contract Documents. The Contractor shall monitor the progress of the Work for conformance with the requirements of the Project Schedule and shall promptly advise the Owner and Construction Manager of any delays or potential delays.
- § 3.10.2.1 The Construction Manager shall prepare, publish, and, from time-to-time, revise a master integrated Project Schedule based upon the construction schedules submitted by the Contractor and other Contractors. Failure by the Contractor to furnish any required schedule or schedule revision in a timely manner shall entitle the Construction Manager to prepare a schedule for the Contractor's Work, to which the Contractor shall be bound.
- § 3.10.2.2 The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict, delay in or interference with the Work of other Contractors or the construction or operations of the Owner's own forces. The Owner shall have the right, without penalty, to direct the Contractor to delay, postpone or reschedule any portion of the Work that may interfere with or disrupt the operations of the Owner.
- § 3.10.3 The Contractor shall conform to the most recent Project Schedule.

- § 3.10.4 In the event the Owner determines that the performance of the Work has not progressed to the level of completion required of the Contract Documents or that the Contractor has failed to maintain its construction schedule or the Project Schedule, the Owner shall have the right to order the Contractor to take corrective measures necessary to expedite the progress of construction including without limitations, additional shifts, overtime, additional manpower or equipment as well as other similar measures (hereinafter referred to collectively as "extraordinary measures"). Such extraordinary measures shall continue until the progress of Work complies with milestone and critical path dates set forth in the Contract Documents and the Project Schedule. The Contractor shall not be entitled to an adjustment in Contract Sum or Contract Time in connection with extraordinary measures required by the Owner.
- § 3.10.5 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter update it as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Construction Manager's and Architect's approval. The Architect and Construction Manager's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Construction Manager and Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.
- § 3.10.6 The Contractor shall participate with other Contractors, the Construction Manager and Owner in reviewing and coordinating all schedules for incorporation into the Project Schedule that is prepared by the Construction Manager. The Contractor shall revise the construction schedule and submittal schedule as deemed necessary by the Construction Manager to conform to the Project Schedule and the Contract Documents.
- § 3.10.7 The Contractor shall perform the Work in general accordance with the most recent construction schedules submitted to the Owner, Construction Manager and Architect and incorporated into the approved Project Schedule. The Contractor shall monitor the progress of the Work for conformance with the requirements of its construction schedule and Project Schedule and shall promptly advise the Owner of any delays or potential delays affecting the critical path.
- § 3.10.8 If the Contractor fails to maintain the approved construction schedule or Project Schedule and meet all critical path dates for the Work, the Owner may request a recovery plan from the Contractor and reserves the right to withhold payment until such time as the Contractor submits a recovery plan. The recovery plan must show how the Work may plausibly be brought on schedule, including, as necessary, acceleration of the Work by means of overtime, additional crews, additional shifts, additional equipment or re-sequencing of the Work to achieve completion of the remaining critical path dates in the construction schedule or Project Schedule. The Contractor shall submit as part of its recovery plan: (i) a "resource loaded" schedule showing the Contractor's plan to deploy manpower per trade, per work area, per day, together with essential materials and equipment, and other resources necessary to timely accomplish the Work; and (ii) a two-week "look ahead" schedule identifying tasks to be accomplished within the coming two week period, the work areas and categories of work, and necessary manpower resources, together with other data necessary to demonstrate to the Owner the viability of the Contractor's recovery plan ("2 Week Plans"). The Contractor shall continue to submit 2 Week Plans until either the Contractor demonstrates that the Project Schedule has recovered from the unexcused delay, or the Owner notifies the Contractor in writing that further 2 Week Plans are no longer required. The cost of preparing and performing the recovery plan shall be borne solely by the Contractor. No approval or consent by the Owner of any plan for resequencing or acceleration of the Work submitted by Contractor shall constitute a waiver by Owner of any damages or losses which the Owner may suffer by reason of such resequencing or the failure of the Contractor to meet the Substantial Completion Date or the final completion date.
- § 3.10.9 The Contractor specifically represents and warrants to the Owner that that the Contract Sum and the Contract Time contemplate compliance with all current, and reasonably foreseeable future, federal, state and local "Stay at Home," "Social Distancing" and related orders, regulations and guidance related to limiting the spread of COVID-19 disease (the "COVID Requirements"). Accordingly, the Contractor hereby waives any claim for an increase in the Contract Sum or an extension of the Contract Time on account of the COVID Requirements. The Contractor shall promptly notify the Owner of any COVID Requirements that would impact the Project.
- § 3.10.10 Due to the ongoing COVID-19 pandemic and the resulting uncertainty with regard to, among other things, (a) what restrictions, if any, will be applicable to construction activities due to federal, state or local orders, laws, regulations or rules related to the COVID-19 pandemic (including, without limitation, social distancing, PPE, cleaning and disinfection requirements) and (b) the duration of any restrictions imposed on construction activities, the Owner

may modify the schedule set forth in the Contract Documents and the Project Schedule. Similarly, restrictions, if any, that will be or are applicable to construction activities due to federal, state or local orders, laws, regulations or rules related to the COVID-19 pandemic (including, without limitation, social distancing, PPE, cleaning and disinfection requirements) may cause the Owner to have the Work or the Project commence later than the date specified in the Contract Documents. The Contractor acknowledges and agrees that there should be no additional compensation paid for schedule modifications caused directly or indirectly by the COVID-19 pandemic. The Contractor further acknowledges and agrees that its sole remedy for any schedule modifications or delays caused directly or indirectly by the COVID-19 pandemic shall be an extension of the Contract Time, if warranted. The Contractor further acknowledges and agrees that it shall have on file and provide a copy to the Owner of its written COVID-19 business reopening plan, and it shall comply in all respects with such plan for the duration of the Project. The Contractor, not the Owner, shall be responsible for compliance with its COVID-19 business reopening plan and all safety requirements associated with COVID-19 protections for workers and the general public.

§ 3.11 Documents and Samples at the Site

§ 3.11.1 The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These documents shall be available to the Architect and delivered to the Construction Manager for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.11.2 The Contractor shall maintain at the site, and shall make available to the Owner, Construction Manager and Architect, one record copy of the Drawings (the "Record Drawings") in good order. The Record Drawings shall be prepared and updated during the prosecution of the Contractor's Work. The prints for Record Drawing use will be a set of black line prints provided by the Architect to the Contractor at the start of construction. The Contractor shall maintain said set in good condition and shall use colored pencils to mark up said set with "record information" in a legible manner to show: (i) deviations from the Drawings made during construction; (ii) details in the Work not previously shown; (iii) changes to existing conditions or existing conditions found to differ from those shown on any existing drawings; (iv) the actual installed position of equipment, piping, conduits, light switches, electric fixtures, circuiting, ducts, dampers, access panels, control valves, drains, openings, and stub-outs, etc.; (v) architectural and structural changes in the design; and (vi) such other information as either the Owner or Architect may reasonably request. At the completion of the work, the Contractor shall transfer all information on record drawings to reproducible drawings with new information clouded and noted. Such drawings shall be stamped with the Contractor's name and "AS-BUILT" in the lower righthand corner. The colored record drawing and the as-built reproducible drawing shall be forwarded to the Construction Manager for delivery to the Owner. Final payment and any retainage shall not be due and owing to Contractor until the Record and As-Built drawings receive the approval from the Architect and the Owner (and all other closeout requirements are met).

§ 3.11.3 The Contractor shall maintain all approved permit drawings in a manner so as to make them accessible to government inspectors and other authorized agencies having jurisdiction over the Project. All approved drawings shall be wrapped, marked and delivered to the Owner within 60 days of final completion of the Contractor's Work.

§ 3.12 Shop Drawings, Product Data, and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work. Each submittal shall bear written confirmation that the Contractor has satisfied its obligations under the Contract Documents with respect to the Contractor's review and approval of the submittal. The Contractor shall comply with the provisions and procedures for Shop Drawings, Product Data, and Samples set forth in the Project Manual, including Specifications Section 013300, "Submittal Requirements."

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, operating and maintenance procedures, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

- § 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to (1) demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents, and (2) show a system or product's ability to meet applicable criteria for those portions of the Work for which the Contract Documents require submittals. Review by the Architect and Construction Manager is subject to the limitations of Sections 4.2.10 through 4.2.12. Informational submittals upon which the Construction Manager and Architect are not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Construction Manager or Architect without action.
- § 3.12.4.1 Shop drawings and product submittals for all site improvement, architectural, structural, mechanical, electrical and signal work shall be submitted to the Architect for its review. Refer to Contract (General, Supplementary and other conditions) Section on "Submittal Requirements" for more complete information.
- § 3.12.4.2 The Contractor represents and warrants that all shop drawings shall be prepared by a person or entity possessing expertise and experience in the trade for which the shop drawing has been prepared and, if required by the Contract Documents or law, by a licensed professional engineer.
- § 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, with copies to the Construction Manager, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the Project submittal schedule approved by the Construction Manager and Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of other Contractors, Separate Contractors, or the Owner's own forces. The Contractor shall cooperate with the Construction Manager in the coordination of the Contractor's Shop Drawings, Product Data, Samples, and similar submittals with related documents submitted by other Contractors.
- § 3.12.5.1 No extension of time will be granted to the Contractor because of failure to have shop drawings, product data, and samples submitted in ample time to allow for review by the Architect or its consultants.
- § 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner, Construction Manager, and Architect, that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. The Contractor shall be responsible for verification of field dimensions and conditions and shall furnish such information to the Architect when requested. Before the Contractor proceeds with the Work in question, the Contractor should field verify all dimensions. In case of doubt about dimensions, the Contractor should notify the Architect immediately for instructions.
- § 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been reviewed and approved by the Architect. Resubmission of rejected documents shall be performed within 10 calendar days, or sooner if required by the progress of construction. No claim for delay or cost shall be accepted as a result of rejected submittal documents. If the Architect is required to review the Contractor's submittal more than twice, the Contractor shall bear the cost and expense associated with such additional review as set forth in the Project Manual.
- § 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Construction Manager and Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.
- § 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Construction Manager and Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to

such revisions. Resubmission of rejected documents shall be performed within ten (10) calendar days. No claim for delay or cost shall be accepted as a result of rejected documents.

- § 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.
- § 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.
- § 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Construction Manager and Architect at the time and in the form specified by the Architect.
- § 3.12.11 The Architect's review of the Contractor's submittals will be limited to examination of an initial submittal and one resubmittal. The Owner is entitled to obtain reimbursement from the Contractor for amounts paid to the Architect for evaluation of additional resubmittals.
- § 3.12.12 When professional certification of performance criteria of materials, systems or equipment is required of the Contractor, the Architect shall be entitled to rely in a reasonable and professional fashion upon the accuracy and completeness of such calculations and certifications, provided, however, if the Architect, in its reasonable and professional judgment considers it advisable, the Architect shall verify the accuracy and completeness of any and all such calculations and/or certifications. In the event any and all such calculations and/or certifications are found to be inaccurate and/or incomplete by the Architect, the Contractor shall assume full responsibility and shall bear all costs attributable or related thereto, including, without limitation, the expense of the Architect's additional services associated with the verification of such calculations and/or certifications and the expense of the Architect's additional service made necessary by the failure of such calculations and/or certifications to be accurate or complete.
- § 3.12.13 All shop drawings for any architectural, structural, mechanical or electrical work must be submitted to the Architect through the Construction Manager. The Contractor represents and warrants that all shop drawings shall be prepared by persons and entities possessing expertise and experience in the trade for which the shop drawing is prepared and, if required by the Architect or applicable law, by a licensed engineer.
- § 3.12.13.1 Each shop drawing shall contain a title block with provisions for the following:
 - (1) Number and Title of Drawing.
 - (2) Date of Drawing or Revision.
 - (3) Name of Project.
 - (4) Name of Contractor or Sub-contractor submitting Drawing.
 - (5) Specification Section Title and Number.
 - (6) Space for Architect's Stamp and Received Stamps.
- § 3.12.13.2 Each shop drawing shall have listed on it all Contract Reference Drawing Numbers plus Shop Drawing Numbers on related work by other Sub-contractors if available.

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- § 3.12.13.3 Each shop drawing submission cover sheet shall indicate the number of times the submittal has been submitted (e.g., whether first, second, third, etc.).
- § 3.12.13.4 Shop drawings for work of one trade shall be checked by Sub-contractors of related trades, and shall have received their stamp of approval before being submitted to the Architect, through the Construction Manager.
- § 3.12.13.5 Each shop drawing submission after the first submission shall be clear of all previous stamps.
- § 3.12.14 Contractor shall communicate and supply Shop Drawings to other Contractors to ensure proper coordination.

§ 3.13 Use of Site

- § 3.13.1 The Owner shall not be liable to the Contractor, subcontractors of any tier, suppliers, their employees or anyone else with respect to the condition of the Project site. The Owner shall have the right to refuse admittance to the site to any agent or employee of the Contractor, its subcontractors of any tier, or its suppliers whose presence the Owner deems hostile to the Owner's interests. The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment. The use of the Owner's assets and property are extremely limited. The Contractor shall fully comprehend the intent of the Contract Documents pertaining to site and building limitations including, without limitation, Division 1 Specifications sections, the phased construction plan, and the site safety and logistics plan(s).
- § 3.13.2 The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Construction Manager before using any portion of the site.
- § 3.13.3 The Contractor shall perform and shall ensure that all Subcontractors and suppliers perform all Work in a manner that permits reasonable access to the Project site and to all adjacent premises. The Contractor shall not, and shall not permit any Subcontractor or supplier to, conduct the Work in a manner that disturbs or that could be reasonably anticipated to disturb operations and persons located in or on portions of the site not affected by the Work. The occupied portion of any of the Owner's buildings shall always comply with the minimum requirements necessary to maintain a certificate of occupancy.
- § 3.13.4 Construction Rules and Regulations. The following rules and regulations shall be observed and enforced by all Contractors in connection with all phases of the Work:
 - In accordance with New York State law, smoking is prohibited anywhere on school property. Violators will be subject to arrest and/or fine of \$1,000 per occurrence. No alcoholic beverages or controlled substances are permitted on school property, and persons under the influence of alcoholic beverages or controlled substances may not enter in or remain on school property.
 - In accordance with the United States Gun-Free School Zones Act of 1994, no firearms are permitted within 1,000 feet of any school building, with certain limited exceptions as set forth therein. In addition to such limitations, no firearms shall be brought on school property without the Owner's express prior
 - Appropriate protective gear (hard hats, safety shoes, goggles, etc.) are to be worn as required by OSHA standards, the New York State Department of Labor, and prudent practice. Shirts are to be worn at all times. No short pants are permitted.
 - Any person who uses inappropriate language, or who is disruptive to the school environment, will be banned from the site.
 - .5 The Contractor's personnel shall not converse with school employees, students and or local residents.
 - .6 All persons on the Project site will comply with all reasonable instructions regarding conduct and safety which are given by the Architect, the Construction Manager or the Owner's school administrators.
 - .7 All construction materials shall be stored in a safe and secure manner. No deliveries will be allowed during school bus drop off or pick up hours as determined by the Owner. All deliveries shall be scheduled and coordinated with the Construction Manager and the Owner's security department. Unexpected or uncoordinated deliveries may be turned away by the Owner or the Construction Manager at the discretion or necessity of the Owner. The Owner's enforcement of this provision shall

- not be construed by the Contractor or Subcontractor as the basis for a claim of delay in time or monetary damages alleged to have been incurred as a result of refusal of delivery.
- .8 Use of the existing building facilities during construction is prohibited, specifically including toilet rooms, telephones and water fountains.
- .9 The Contractor's schedule shall allow for blackout dates during which no noisy Work will be allowed, as determined by the Construction Manager. The Contractor may consult the Owner's school calendar for all test and examination dates, but these dates are subject to change.
- To gain access to the Work, entrances and parking areas will be designated by the Owner for the Contractor's use. Any vehicles or trucks in non-designated areas may be towed at the Contractor's expense. Gates shall always be locked unless a worker is in attendance to prevent unauthorized entry.
- .11 Should it become necessary to obtain access to the existing building during construction hours for measurements or other non-disruptive work, the Contractor shall be escorted by the Construction Manager.
- All persons must wear photo identification badges at all times while working at the site. Identification badges must be provided by the Contractor for its personnel, including subcontractors, consultants, visitors and others.
- .13 No asbestos containing products are to be used anywhere on this Project.
- .14 No lead containing products are to be used anywhere on this Project.
- .15 Asbestos manifests showing the locations of all known asbestos bearing materials are available in each building, and should be consulted prior to the commencement of any work, including but not limited to demolition.
- .16 Demolition is to occur only when the building is unoccupied. Dust partitions and negative air are to be installed prior to commencing demolition. The Contractor must obtain Construction Manager approval on dust partitions and negative air prior to commencing demolition work. Debris shall be removed by using an enclosed chute or similar sealed system.
- .17 (a) Prior to the commencement of Work, the Contractor must submit construction plans, which show the location of dust particles, exhaust & fresh air fans and describe in detail the operation procedures during demolition and construction which may generate dust.
 - (b) All entrances to classrooms shall be sealed with at least 6 mil. polyethylene sheeting to prevent dust created by demolition and construction work from entering the classrooms. Entrances and egress to the work zone shall be covered with a triple flap 6 mil. polyethylene doorway to allow access to the area without the release of dust. The Contractor is, additionally, responsible for all debris and dust infiltrating adjacent and undisturbed areas of the building.
 - (c) Shut down and lock out all electrical and HVAC in the work area. Cut, cap, and seal all duct work where it enters the work area from another space. All duct work and conduit within the space shall be removed during demolition work.
 - (d) The Contractor shall install dust protection barriers and poly sheeting. There shall be no or minimum damage to adjacent surfaces. The Contractor is responsible to repair any damage to existing surfaces.
- Painting or other chemical applications shall be done in the Owner's existing building only when it is unoccupied. Storage of chemicals and painting shall be outside the Owner's existing or new structures, and shall follow manufacturer's storage guidelines.
- .19 Oxygen or other gas containers shall be properly stored and secured per OSHA requirements, to the satisfaction of the Construction Manager. Failure to do so will result in a \$250 back-charge, per occurrence.
- .20 The Contractor is responsible for cleaning its own materials and debris. Failure to maintain a clean work site daily will result in others performing the work at the Owner's request, and the Contractor will be backcharged for the cleaning cost plus construction administration fees. This may be done without the typical 3-day notice to the Contractor.
- .21 The Contractor must send a qualified representative, knowledgeable in the Project and authorized to make decisions on behalf of the Contractor, to every Project meeting.
- .22 The Contractor shall cooperate with the Owner's school principal and custodial staff; however, if any additional work is requested the Contractor shall not proceed unless written approval is received from the Owner. The Contractor will not be compensated for any additional work performed without the Owner's prior written approval.

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- .23 Deliveries sent to the Project site will not be signed for or unloaded by the Owner. They will be directed to the construction site and if no employee is on site, the delivery will be rejected, at the Contractor's expense.
- .24 The General Construction Contractor shall be responsible for managing dust and dirt. On the exterior, site shall be watered down frequently to prevent dust clouds from rising. Streets shall be maintained clean per the Construction Manager's request.
- .25 All hot tar roofing shall be installed after school hours or on weekends/holidays only. Kettles shall not be lit until all students have left the Owner's building.
- .26 The Contractor shall submit a weekly work schedule indicating workdays, work hours and manpower allocation.
- .27 No storage of materials will be permitted within the Owner's buildings at any time during construction. The Contractor must provide exterior storage containers when required. The Contractor shall be responsible for securing appropriate space for its material with the Construction Manager prior to delivery. Final location of storage containers shall be determined by the Owner and/or Construction Manager. If insufficient space is available on the site, the Contractor shall provide local off-site storage, storage containers, etc. at its own cost and expense. Should any of the material stored on-site obstruct the progress of any portion of the Work or the Project, this material shall be removed by the Contractor without reimbursement of cost, from place to place or from the premises, as the Construction Manager may direct.
- .28 The General Construction Contractor shall be responsible for maintaining all appropriate site safety signage.
- .29 The Contractor shall be responsible for protecting the Owner's property. All existing shrubs, trees, lawn fixtures, sculptures and miscellaneous equipment shall be protected at all times. Any removals or relocation of said objects, if allowed shall be as directed by the Owner in writing.
- 30 The General Construction Contractor shall provide and service portable lavatories for the duration of construction as provided in the Contract Documents. Lavatories shall be serviced by the General Construction Contractor on a regular basis to maintain sanitary conditions.
- .31 The General Construction Contractor shall protect all existing roofs during construction and shall be responsible for any damage to roofs during construction. The General Construction Contractor shall make all repairs to any damaged areas, as required by the manufacturer of the roof system.
- .32 The General Construction Contractor shall be responsible for providing weather-proof protection over all rough openings, including windows.
- .33 The Contractor shall be responsible for conducting pre-construction walk-throughs and videotaping existing conditions. The Contractor shall schedule a representative of both the Owner and the Construction Manager to be present at this taping. In the absence of this record, the Contractor shall be responsible for paying the costs associated with any and all repairs in an area where the Contractor is working or has worked, as may be deemed necessary by the Owner or the Construction Manager.
- .34 Manufacturers Material Safety Data Sheets (MSDS) shall be available at the site for all products used in the Project.
- No weapons are permitted on the Owner's property by law.
- .36 Neither the Contractor nor any person on its behalf shall, in any manner, engage in discrimination, intimidation or harassment of any person on the Project site.
- .37 Proper attire is required for personal safety and clothing must not sexually explicit or contain messages of a vulgar nature, disrespectful of ethnic or religious groups, or which promote the use of tobacco, alcohol or drugs.
- Only materials and equipment that are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project site. Protection of construction materials and equipment stored at the Project site from weather, theft, damage, and all other adversity is solely the responsibility of the Contractor.
- .39 The Contractor will ensure that the Work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. The Work will be performed in such a manner that public areas adjacent to the site of the Work will be free from all debris, building materials and equipment likely to cause hazardous conditions. Without limitation of any other provision of the Contract Documents, the Contractor will use its best efforts to minimize any interference with the occupancy or beneficial use of (1) any areas and buildings adjacent to the site of

- the Work; or (2) the Owner's building in the event of partial occupancy, as more specifically described in Section 9.9.
- .40 The Contractor is required to protect its own Work and work areas, preconstruction, during construction and post construction.
- **.41** During exterior renovation work, overhead protection shall be provided for any sidewalks or areas immediately beneath the work site or such areas shall be fenced off and provided with warning signs to prevent entry.
- .42 The Contractor shall exert utmost care and diligence when working in or near any existing buildings or site work. The absence of protection around such items shall not excuse the Contractor from its liability to provide protection. Any damage to existing buildings, sitework or facilities due to the actions or inactions of the Contractor shall be repaired by and charged to the Contractor.
- .43 The Contractor shall be responsible for the removal and replacement of existing ceiling tiles and grid in areas of the existing building where its Work is required and new ceilings are not scheduled for installation. In the event that the existing ceilings are damaged and cannot be replaced to the satisfaction of the Owner, the responsible contractor shall be liable for the costs of replacing in kind, the existing ceilings with new tile and grid.
- The General Construction Contractor shall provide necessary and required security measures to adequately safeguard the construction site from vandalism and intrusion of unauthorized persons. The General Construction Contractor shall submit its means and methods of security to the Construction Manager for review and comment. The Project site must be secured 24 hours a day, 7 days a week including holidays. The General Construction Contractor's failure to secure the site as required by this paragraph will result in the Owner engaging the services of such necessary personnel so as to provide such security. No notice will be given the General Construction Contractor of the Owner's intention to engage such security services and all costs and expenses associated with the Owner's security of the site in this regard will be back charged to the General Construction Contractor. While the Owner may have security guards patrolling the project areas, the function of such security guards is not for the purpose of specifically guarding the Contractor's property or operations of work.
- The Contractor and any entity for which the Contractor is responsible shall not erect any sign on the Project site without the written consent of the Owner, which may be withheld in the sole discretion of the Owner.
- Without limitation of any other provision of the Contract Documents, the Contractor will comply with all reasonable rules and regulations promulgated by the Owner or Construction Manager in connection with the use and occupancy of the Project site and the buildings, as amended from time to time by the Owner or the Construction Manager.
- § 3.13.5 Only materials and equipment that are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project site. Protection of construction materials and equipment stored at the Project site from weather, theft, damage, and all other adversity is solely the responsibility of the Contractor.
- § 3.13.6 The Contractor shall ensure that the Work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. The Work will be performed in such a manner that public areas adjacent to the site of the Work will be free from all debris, building materials and equipment likely to cause hazardous conditions. Without limitation of any other provision of the Contract Documents, the Contractor shall use its best efforts to minimize any interference with the occupancy or beneficial use of (1) any areas and buildings adjacent to the site of the Work; or (2) the building in the event of partial occupancy, as more specifically described in Section 9.9.
- § 3.13.7 The Contractor shall not permit any workers to use any existing facilities at the Project site, including without limitation, lavatories and toilets. To gain access to the Work, entrances and parking areas will be designated by the Owner for the Contractor's use. Without limitation of any other provision of the Contract Documents, the Contractor will comply with all reasonable rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project site and the Owner's building(s), as amended from time to time by the Owner.
- § 3.13.8 Construction areas that are under the control of the Contractor and therefore not occupied by the Owner's staff or students shall be separated from occupied areas. Provisions shall be made to prevent the passage of dust and contaminants into occupied parts of the Owner's building(s). Periodic inspection and repairs of the containment

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barriers must be made to prevent exposure to dust or contaminants. Gypsum board must be used in exit ways or other areas that require fire rated separation. Heavy duty plastic sheeting may be used only for a vapor, fine dust or air infiltration barrier, and shall not be used to separate occupied spaces from construction areas.

§ 3.13.9 Prior to starting Work, the Contractor shall submit a written report to the Owner, Construction Manager and Architect identifying existing damage to roads, walks, lawns, buildings and other property to be affected by this Contract. Failure to submit the report shall render the Contractor responsible for existing damage. The Contractor may request and schedule an inspection with the Owner, Construction Manager and Architect prior to submittal of the report. The Contractor shall obtain the consent of adjoining property owners regarding temporary easements of any other manner of physical encroachment.

§ 3.14 Cutting and Patching

- § 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.
- § 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner, Separate Contractors, or of other Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner, Separate Contractors, or by other Contractors except with written consent of the Construction Manager, Owner, and such other Contractors or Separate Contractors. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Separate Contractors, other Contractors, or the Owner, its consent to cutting or otherwise altering the Work.
- § 3.14.3 The word "new" used herein shall mean Work which has been or is to be installed under the terms of the Contract for this Project. The word "existing" used herein shall mean existing conditions previous to the award of a Contract for this Project. In order to eliminate cutting and patching as much as possible, the Contractor shall, during the progress of its Work, provide and set proper sleeves, inserts, and other fixtures as required for its new Work and shall give proper and detailed instructions to others where the Work may be affected by their work, with adequate notice prior to the erection of new Work. Cutting and patching work as required to install new Work or remove existing work shall be done carefully and neatly with as little damage as possible. The Contractor shall refer to the Specifications for proper cutting and patching requirements. Any costs caused by defective or ill-timed Work of the Contractor shall be borne by the Contractor. Cutting and patching of any Work shall be made in such a manner as to not breach any provisions of any guaranty or warranty on existing work left in place or any guaranty or warranty required for the Contractor's new Work. Patching of work shall match existing adjacent surfaces and patchwork shall be disguised completely to hide any trace of patching. All new Work on existing roofs must be provided by a company specializing in performing the Work and approved by the existing roofing material manufacturer. It shall be the responsibility of the Contractor performing the cutting and patching to maintain any existing roofing warranty.
- § 3.14.4 Only trades persons skilled and experienced in cutting and patching shall perform such work.

§ 3.15 Cleaning Up

- § 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. On a daily basis, the Contractor shall clean the areas in which it has performed work and shall remove all waste, materials, rubbish, its tools, construction equipment, machinery and surplus materials. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project. The Contractor shall completely clean the site of the Work, removing and disposing of all construction-related debris and rubbish, and cleaning all Work-related stains, spots, marks, dirt, mortar smears, plaster smears, paint smears, caulking smears, and other foreign materials from exposed surfaces inside and outside the Owner's buildings and within the Project limit lines.
- § 3.15.1.1 All Contractor's work areas shall be kept clean each day, of refuse, including containers, cups and the like. The facilities will remain in operation during the course of the entire construction operation. All Contractors performing work on this Contract shall schedule their work so as not to interfere with any traffic to and from the required areas of use. The Contractor shall be responsible for maintaining all traffic and shall provide all barriers and protection as required to safeguard the work and the public and the occupants of the building during construction. The

Prime Contractors shall comply with all fire code regulations during construction. They include vehicular parking, smoke partitions, rescue window obstructions, use of extension cords. The fire code is available for reference at the Buildings and Grounds office.

§ 3.15.1.2 Each Contractor shall be responsible for cleaning their rubbish daily and removing all rubbish from the interior and exterior site weekly or when otherwise requested by the Owner. The General Contractor shall broom sweep all construction areas at least every Friday. Surfaces shall be left clean of mortar and paint spots and the like. The Contractor shall work in a condition approved by the Construction Manager. An inspection will occur on Friday afternoon and failure to properly clean will result in the Owner engaging a cleaning company each time the requirement is not met, without prior notification to the Contractor.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner, or Construction Manager with the Owner's approval, may do so and the Owner shall be entitled to reimbursement from the Contractor. At its option, the Owner may deduct the cost of clean-up pursuant to this Section 3.15.2 from any payments otherwise due to the Contractor pursuant to this Contract.

§ 3.15.3 Final Cleaning

- **A.** General: General cleaning during construction is required by the General Conditions and included in Division 01.
- **B.** Final Cleaning: Clean each surface or unit to the condition expected in normal commercial building cleaning. Comply with manufacturer instructions. Complete the following cleaning operations before requesting inspection for Certificate of Substantial Completion.
 - 1. Clean transparent materials including glass in doors windows. Replace any damaged glass.
 - **2.** Clean exposed finishes to a dust free condition, free of stains, films, fingerprints and similar foreign substances. Clean floors as recommended by the manufacturers if new, if existing carpeted floors shall be vacuumed and wood, ceramic tile and vinyl tile floor floors shall be mopped.
 - **3.** Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
- **C.** Removal of Protection: Remove temporary protection and facilities installed for protection of work during construction unless otherwise directed by the Owner, Architect or Construction Manager.
- **D.** Compliance: Comply with authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

§ 3.16 Access to Work

The Contractor shall provide the Owner, Construction Manager, and Architect with access to the Work in preparation and progress wherever located. Federal, state, and local agencies with jurisdiction over the Project shall at all times have access to the Work wherever it is in preparation or progress. The Contractor shall provide for such access so that such agencies may perform their functions. The Contactor shall also allow access for all required tests and inspections.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner, Construction Manager, and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner, Architect, or Construction Manager. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect through the Construction Manager.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall, and cause its Subcontractors to, defend, indemnify and hold harmless the Owner, Construction Manager, Architect, the State of New York and their consultants, officers, directors, Cooperative Board members, agents and employees of any of them (collectively, "Indemnitees," individually, "Indemnitee") from and against all losses, damages, liabilities, actions, causes of action, claims, demands, fines, penalties, judgments, costs (including but not limited to attorneys' fees and expenses incurred in connection therewith and in the enforcement of this indemnification), charges, expenses and demands of whatever

kind in connection with or arising from or out of (a) any negligent, willful or wrongful act or omission resulting in bodily injury (including death), personal injury or property damage (including loss of use) by the Contractor, its Subcontractors, Suppliers, their respective officers, employees, servants, agents, suppliers, invitees, successors and assigns (collectively, "Contractor Parties," and individually, "Contractor Party"), (b) performance of or failure to perform the Work or any breach of this Contract or infringement of any patent right by any Contractor Party, or (c) any statutorily imposed liability for injury to employees or failure to comply with any laws or regulations affecting the Work, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Nothing contained herein shall be construed to obligate the Contractor to indemnify, defend, and hold an Indemnitee harmless for claims caused solely by the Indemnitee's negligent acts or omissions. The State of New York is an Indemnitee if New York State funding, excluding SED state building aid, is used for this Project.

The Contractor agrees to include the following indemnity provision in each and every contract it enters into with a Subcontractor, and to require that Subcontractor to include such provision in each contract it enters into with any lower tier Sub-subcontractor: "To the fullest extent permitted by law, sub-contractor shall defend, indemnify and hold harmless the Contractor, the State of New York, Owner, Owner's Consultants, Construction Manager's and Architect's consultants, and each of their respective representatives, Cooperative Board members, employees, directors, officers, and agents, from and against any and all claims, suits, actions, damages, losses, fines, penalties, costs, charges and expenses, including but not limited to attorneys' fees and the costs of any proceeding, arising out of or resulting from any performance of or failure to perform the Work, acts or omissions of the Subcontractor, its lower-tier Sub-subcontractors, and others for whom the Subcontractor is responsible, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or economic losses or damages, damage to or destruction of property, and for environmental damage, or to injury to or destruction of tangible property and nuisance, but only to the extent caused by the acts or omissions or a breach of contract of the a Subcontractor, a Sub-Subcontractor to Subcontractor, and any person or entity directly or indirectly employed by them or any person or entity for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder."

- § 3.18.1.1 The Owner's right to indemnification shall in no way be diminished, waived or discharged by the exercise of any other remedy provided by the Contract Documents or by law.
- § 3.18.1.2 The Owner may withhold from an offending Contractor's Contract Sum an amount sufficient to cover any damages sustained by person or entity indemnified by the Contractor pursuant to this Section 3.18 and all expenses and costs associated with the damage sustained.
- § 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.
- § 3.18.8.1 Whenever any party to the Contract is required in words or substance to indemnify or hold harmless another party, whether or not the following is expressly included in whole or in part in the paragraph or section with regard to such particular indemnification and hold harmless provision, such indemnification and hold harmless provision shall include, but not be limited to, the payment or reimbursement of all judgments, claims, damages, losses, fees costs and expenses and litigation costs and expenses, including but not limited to, the reasonable fees of its attorneys and witnesses.
- § 3.18.8.2 Whenever the Contractor is required in this Section 3.18 or any other provision of the Contract Documents to defend the Owner, the Owner's Cooperative Board, the Architect, or the Construction Manager or their respective consultants, officers, directors, officials, employees, servants and agents (the "Indemnitees") against any claim, action, or proceeding, in the event the Contractor shall fail or refuse to defend any one or more of the Indemnitees, the Contractor shall be liable to such Indemnitee for all costs such Indemnitee incurs in defending such claim, action or proceeding and all costs of such Indemnitee, including attorneys' fees, incurred to recover such defense costs from the Contractor.
- § 3.18.3 The Contractor's defense and indemnity obligations under this Section 3.18 shall specifically include all claims and judgments that may be made against the Indemnitees under the Labor Law of the State of New York, and

similar laws of other state or governmental bodies having jurisdiction; and further, against claims and judgments arising from violation of public ordinances and requirements of governing execution of the Work.

- § 3.18.4 Claims by Governmental Authorities. To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Indemnitees from and against claims, damages, losses, and expenses arising out of any claims made against the Indemnitees under the laws of federal, state, or other governmental bodies having jurisdiction over the Work, including but not limited to claims arising from violation of public ordinances and other requirements of governing authorities, due to the Contractor's method of execution of the Work or implementation of any of the Contractor's other obligations under the Contract Documents.
- § 3.18.5 Liens and Security Interests. To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Indemnitees from and against any actions, lawsuits, or other proceedings brought against Indemnitees as a result of liens or security interests of any type arising from the Work and filed against the Work, the site of any of the Work, the Project site and any improvements thereon, payments due the Contractor, or any portion of the property of any of the Indemnitees.
- § 3.18.6 Intellectual Property. The Contractor shall defend, indemnify, and hold harmless the Indemnitees from and against any claim or demand for patent fees, royalties, or otherwise on account of any invention, machine, article, process, copyright, or arrangement that may be used by the Contractor in performing the Work, other than as to any of the foregoing expressly called for in the Contract Documents to be so used. In the event of any injunction or legal action regarding such claim or demand that results in stopping the Work in whole or part, the Owner shall have the right to direct the Contractor to change the manner of performance of the Work to avoid such stoppage, all cost and expense occasioned thereby to be borne solely by the Contractor.
- § 3.18.7 The Contractor shall further indemnify and hold harmless the Indemnitees from and against any costs and expenses (including reasonable attorneys' fees) incurred by any of the Indemnitees in enforcing any of the Contractor's defense, indemnity, and hold harmless obligations under this Section 3.18 or as may otherwise be provided elsewhere in the Contract.
- § 3.18.8 Subject to Section 3.18.9, all obligations of the Contractor under this Section 3.18 to defend the Indemnitees are obligations to provide full defenses at the sole cost and expense of the Contractor, regardless of any alleged culpability on the part of any Indemnitee or any ultimate determination of relative shares of liability of any Indemnitee or limitation of the Contractor's indemnity obligations in light of such determination.
- § 3.18.9 To the extent any defense, indemnity, or hold harmless obligations under this Section 3.18 are made void or otherwise impaired by any law controlling their construction (including but not limited to laws limiting such obligations to the extent of the portion of damages caused by an indemnitor), such obligations shall be deemed to conform to the greatest rights to defense and indemnity permitted by such law (including but not limited to New York State General Obligations Law Section 5-322.1).
- § 3.18.10 All provisions of this Section 3.18 shall survive termination of the Agreement or final completion. No obligations under this Section 3.18 shall be construed to negate, abridge, or reduce other rights or obligations to defense and indemnity, including but not limited to common law indemnity, which would otherwise exist as to a party or person described in this Section 3.18.

§ 3.19 Existing Features and Underground Data

- § 3.19.1 The location of existing features shown on plans is intended for general information only. The Contractor, alone, is responsible for accurate determination of the location of all structures, and shall not be entitled to any increase in the Contract Sum or Contract Time due to difficulties or distances encountered in the Work, which should have been foreseeable thereby.
- § 3.19.2 The locations, depths and data as to underground conditions have been obtained from records, surface indications and data furnished by others. Information furnished is solely for the convenience of the Contractor without any warranty, expressed or implied as to its accuracy or completeness. The Contractor shall make no claim against the Owner, Construction Manager or Architect with respect to the accuracy or completeness of such information if it is erroneous, or if the conditions found at the time of construction are different from those as indicated.

§ 3.20 Construction Stresses

- § 3.20.1 The Contractor shall be solely responsible for the conditions which develop during construction and in the event any structure is dislocated, over strained, or damaged so as to affect its usefulness, the Contractor shall be solely responsible. The Contractor shall, at its own expense, take whatever steps necessary to strengthen, relocate, or rebuild the structure to meet all applicable requirements.
- § 3.20.2 The Contractor is responsible for restoration or repair of utilities, private property, buildings, pavement, walkways, roads, or other property damaged by its activities under this Agreement.

§ 3.21 Training and Instructions

§ 3.21.1 Upon Substantial Completion of the Work, the Contractor shall orient and instruct personnel of the Owner designated by it in the operation and maintenance of all equipment furnished by the Contractor and shall turn over all pertinent literature and operational manuals relating to the equipment. The format for organizing, binding, and delivering such manuals shall be as described in the Specifications.

§ 3.22 Daily Records Clause

- § 3.22.1 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 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.
- § 3.22.2 In the event that any labor or equipment is idled the daily records shall record which laborers and equipment were idled, for how long and the reason such labor or equipment was idle. In the event that specific work activities were stopped, solely as a result of Owner, Construction Manager or Architect 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.
- § 3.22.3 Such daily records shall be copied and provided to the Owner through the Construction Manager 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.
- § 4.1.1.1 Architect's Consultants: All firms listed on the title sheet of the Specifications, except for the Owner and Construction Manager, are Consultants employed by the Architect, and are agents of the Architect and will make observation of their respective branches of the Work. All changes in the Work must be processed through the Architect. Consultants shall not order extra Work or make changes in the Work.
- § 4.1.2 The Construction Manager is the person or entity retained by the Owner pursuant to Section 2.3.3 and identified as such in the Agreement.
- § 4.1.3 The Architect is the interpreter of the technical requirements of the Drawings and Specifications with regard to questions the Contractor may have concerning its obligations under either. The Architect shall render such interpretations with such promptness as necessary to maintain progress of the Work.

§ 4.2 Administration of the Contract

- § 4.2.1 The Construction Manager and Architect will provide administration of the Contract as described in the Contract Documents and will be the Owner's representatives during construction until the date the Architect issues the final Certificate for Payment and during the correction period described in Article 12. The Construction Manager and Architect have the authority to act on behalf of the Owner only to the extent provided in the Contract Documents.
- § 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make

exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of the site visits, the Architect will keep the Owner and the Construction Manager reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner and Construction Manager known deviations from the Contract Documents and defects and deficiencies observed in the Work.

- § 4.2.3 The Construction Manager shall provide one or more representatives who shall be in attendance at the Project site whenever the Work is being performed. The Construction Manager will determine in general if the Work observed is being performed in accordance with the Contract Documents, will keep the Owner and Architect reasonably informed of the progress of the Work, and will promptly report to the Owner and Architect known deviations from the Contract Documents and the most recent Project schedule, and defects and deficiencies observed in the Work.
- § 4.2.4 The Construction Manager will schedule and coordinate the activities of the Contractor and other Multiple Prime Contractors in accordance with the latest approved Project Schedule. The Contractor shall participate with other Contractors and the Construction Manager, the Architect and Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule deemed necessary by the Owner or Construction Manager. The approved construction schedules shall be integrated into the Project Schedule and constitute the schedules to be used by the Contractor, other Contractors, the Architect, the Construction Manager and the Owner until subsequently revised.
- § 4.2.4.1 The Contractor shall assume full responsibility for the execution of its Work in the allotted duration times set forth in the Project Schedule.
- § 4.2.5 The Construction Manager, except to the extent required by Section 4.2.4, and Architect will not have control over, 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 Facilitating Contract Administration. Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Construction Manager, and shall contemporaneously provide the same communications to the Architect about matters arising out of or relating to the Contract Documents. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with other Multiple Prime Contractors shall be through the Construction Manager and shall be contemporaneously provided to the Architect if those communications are about matters arising out of or related to the Contract Documents. Communications by and with the Owner's own forces shall be through the Owner.
- § 4.2.7 The Construction Manager and Architect will review and certify all Applications for Payment by the Contractor, in accordance with the provisions of Article 9. The Construction Manager will assemble each of the Contractor's Applications for Payment with similar applications from other Prime Contractors into a Project Application and Certificate for Payment, all of which will be submitted to the Architect with the Construction Manager's recommendations as to certifications in whole or part by the Architect.
- § 4.2.8 The Architect and Construction Manager have authority to reject Work that does not conform to the Contract Documents and will notify each other about the rejection. The Construction Manager shall determine in general whether the Work of the Contractor is being performed in accordance with the requirements of the Contract Documents and notify the Owner, Contractor and Architect of defects and deficiencies in the Work. Whenever the Construction Manager considers it necessary or advisable, the Construction Manager will have authority to require additional inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, upon written authorization of the Owner, whether or not such Work is fabricated, installed or completed. The foregoing authority of the Construction Manager will be subject to the provisions of Sections 4.2.18 through 4.2.20 inclusive, with respect to interpretations and decisions of the Architect. However, neither the Architect's nor the Construction Manager's authority to act under this Section 4.2.8 nor a decision made by either of them in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect or the Construction Manager to the

Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons performing any of the Work.

- § 4.2.9 The Construction Manager will receive and promptly transmit to the Architect all submittals from the Contractor such as Shop Drawings, Product Data and Samples. The Construction Manager's actions will be taken in accordance with the Project submittal schedule approved by the Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness while allowing sufficient time to permit adequate review by the Architect.
- § 4.2.10 The Architect will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Upon the Architect's completed review, the Architect shall transmit its submittal review to the Construction Manager.
- § 4.2.11 Review of the Contractor's submittals by the Architect is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.
- § 4.2.11.1 The Architect's review of Contractor's submittals shall be limited to an initial submittal and one (1) resubmittal. If the Architect is required to review additional submittals because the initial submittal and resubmittal failed to conform to the information given and the design concept expressed in the Contract Documents, the amount of compensation paid to the Architect by the Owner for additional services shall be deducted from the payments to the Contractor.
- § 4.2.11.2 The review will not be considered complete until an "ACTION" stamp or other written notice to that effect has been received by the Contractor.
- § 4.2.12 The Construction Manager will prepare Change Orders and Construction Change Directives.
- § 4.2.13 The Construction Manager and the Architect will take appropriate action on Change Orders or Construction Change Directives in accordance with Article 7 and the Architect will have authority to order minor changes in the Work as provided in Section 7.4. The Architect, in consultation with the Construction Manager, will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section
- § 4.2.14 Utilizing the documents provided by the Contractor, the Construction Manager will maintain at the site for the Owner one copy of all Contract Documents, approved Shop Drawings, Product Data, Samples and similar required submittals, in good order and marked currently to record all changes and selections made during construction. These will be available to the Architect and the Contractor, and will be delivered to the Owner upon completion of the Project.
- § 4.2.15 The Construction Manager will assist the Architect in conducting inspections to determine the dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion in conjunction with the Architect pursuant to Section 9.8; and receive and forward to the Owner written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10. The Construction Manager will forward to the Architect a final Application and Certificate for Payment or final Project Application and Project Certificate for Payment upon the Contractor's compliance with the requirements of the Contract Documents.

- § 4.2.16 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.
- § 4.2.17 The Architect will interpret and decide matters concerning performance under, and requirements of the Contract Documents on written request of the Construction Manager, Owner or Contractor through the Construction Manager. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.
- § 4.2.18 Interpretations and decisions of the Architect will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings.
- § 4.2.18.1 If Work is described or indicated in a manner which makes it impossible to carry out the requirements of the Contract Documents, or should discrepancies appear among the Contract Documents, the Contractor shall request interpretation before proceeding with the Work. If the Contractor fails to make such a request, no excuse will be entertained for failure to carry out the Work of the Contract Documents. Should a conflict occur in or between Contract Documents, the Contractor is deemed to have included in the Contract Sum the more expensive manner of doing the Work.
- § 4.2.19 The Architect's decisions, after consultation with the Owner, on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.
- § 4.2.20 The Construction Manager will receive and review requests for information from the Contractor, and forward each request for information to the Architect, with the Construction Manager's recommendation. The Architect will review and respond in writing to the Construction Manager to requests for information about the Contract Documents. The Construction Manager's recommendation and the Architect's response to each request will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

(Paragraph deleted)

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

- § 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include other Contractors or Separate Contractors or the subcontractors of other Contractors or Separate Contractors.
- § 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

- § 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, within ten (10) days after award of the Contract, shall furnish in writing to the Construction Manager for review by the Owner, Construction Manager and Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Construction Manager may reply within 14 days to the Contractor in writing stating (1) whether the Owner, Construction Manager or Architect has reasonable objection to any such proposed person or entity or, (2) that the Construction Manager, Architect or Owner requires additional time for review. Failure of the Construction Manager, Owner, or Architect to reply within the 14-day period shall constitute notice of no reasonable objection.
- § 5.2.1.1 In no case shall payments be made on the Contract until a complete list of Subcontractors has been submitted by the Contractor to the Construction Manager for review by the Owner, Construction Manager, and Architect. Such list shall not be considered complete if the Owner, Construction Manager or Architect has any reasonable objection to any name listed thereon. Such list shall be submitted and resubmitted if necessary until it is considered complete.

- § 5.2.1.2 Subcontractors will not be acceptable unless, when requested by the Owner, Architect or Construction Manager, evidence is furnished by the Contractor that the proposed Subcontractor has satisfactorily completed similar subcontracts as contemplated under this Contract, and has the necessary experience, personnel, equipment, plant and financial ability to complete the proposed subcontract in accordance with the intent of the Contract Documents and the Project Schedule. As verification of financial ability, the Owner reserves the right to request and receive up to five (5) years of financial statements, bank references, bond/insurance company references and all other information required to assess financial ability.
- § 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner, Construction Manager or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.
- § 5.2.3 If the Owner, Construction Manager or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner, Construction Manager and Architect have no objection. No increase in the Contract Sum shall be allowed where a Subcontractor is rejected by the Architect, Construction Manager or Owner who is (1) deemed unqualified to perform the particular work subcontracted by the Contractor, (2) does not have the necessary experience, personnel, equipment, plant and financial ability to complete the subcontract, or (3) has a history of poor performance of work of similar nature. Upon receipt of a rejection of a Subcontractor by the Architect, the Contractor shall have the right to request a meeting with the Architect, Construction Manager and the Owner to discuss the reasons it believes the proposed Subcontractor is qualified to perform the work. Upon review of such reasons, the Architect shall reconsider its determination and shall advise the Contractor of its determination upon such review. If the Architect still finds that such proposed Subcontractor does not meet the requirements above stated, it shall advise the Contractor. The Architect's determination upon such review shall be final and binding on the Contractor and its proposed Subcontractor and the Contractor hereby waives any and all claims it or its proposed Subcontractor might have against the Owner, the Construction Manager and the Architect concerning the rejection of such Contractor and shall require its Subcontractors to execute such similar waiver in its agreement with the Contractor.
- § 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner, Construction Manager or Architect makes reasonable objection to such substitution.
- § 5.2.5 The Maintenance of the Project Schedule is critical. The Contractor shall award subcontracts to entities capable of performing in a manner that will maintain the Project Schedule and require its subcontractors to complete their work in accordance with the Project Schedule.
- § 5.2.6 Upon written request from or on behalf of the Owner, the Contractor shall provide to the Owner executed, unredacted copies of all subcontracts, purchase orders or other agreements relating to the Work.

§ 5.3 Subcontractual Relations

§ 5.3.1 By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by the 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. Each subcontract shall contain provision for execution of lien waivers in form and substance acceptable to the Owner as a condition of payment by the Contractor. The Contractor shall require each Subcontractor to (1) inspect the Project site, including all relevant surfaces and job conditions, before beginning the Work and (2) accept or cite necessary corrections in the Project site, including surfaces or job conditions, before beginning the Work.

§ 5.3.2 The Contractor shall promptly notify the Owner and Architect of any material defaults by any Subcontractor or whether it has terminated its agreement with any of its Subcontractors for any reason, except for sums due and owing by Contractor under the subcontract for work performed or material supplied prior to receipt of Owner's notice of its determination to accept the subcontract. Owner shall only be required to compensate the Subcontractor of an accepted subcontract for compensation accruing to such Subcontractor for Work done or materials delivered after the date on which Owner provided notice of its determination to accept the subcontract. All sums due and owing by Contractor to the Subcontractor of an accepted subcontract shall constitute a debt between the Contractor and Subcontractor.

§ 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
 - assignment is effective only after termination of the Contract by the Owner pursuant to Article 14 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
 - .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

- § 5.4.2 Upon such assignment, if the Work has been suspended for more than 60 days, through no fault of the Subcontractor, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.
- § 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor Contractor or other entity.
- § 5.4.4 All subcontracts over \$10,000 shall be in writing with copies of the written subcontract provided to the Owner promptly upon request.

§ 5.5 Owner Payment to Subcontractors

- § 5.5.1 In the event of any default hereunder by the Contractor, or in the event the Owner, Construction Manager, or Architect fails to approve any application for payment, that is not the fault of a Subcontractor, the Owner may make direct payment to the Subcontractor, less appropriate retainage. In that event, the amount so paid the Subcontractor shall be deducted from any sums payable by the Owner to the Contractor.
- § 5.5.2 Nothing contained herein shall create any obligation on the part of the Owner to make any payments to any Subcontractor, and no payment by the Owner to any Subcontractor shall create any obligation to make any further payments to any Subcontractor.

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.

§ 6.1.4 The Contractor accepts assignment of, and liability for, all purchase orders and other agreements for procurement of materials and equipment that are identified as part of the Contract Documents. The Contractor shall be responsible for such pre-purchased items, if any, as if the Contractor were the original purchaser. The Contract Sum includes, without limitation, all costs and expenses in connection with delivery, storage, insurance, installation and testing of items covered in any assigned purchase orders or agreements. All warranty and correction of the Work obligations under the Contract Documents shall also apply to any pre-purchased items, unless the Contract Documents specifically provide otherwise.

§ 6.2 Mutual Responsibility

- § 6.2.1 The Contractor recognizes and acknowledges that the Project is governed by and subject to the provisions of New York State General Municipal Law §101, et seq., governing the award of contracts on public improvement projects. As such, the Contractor recognizes and acknowledges that other Contractors or Separate Contractors will be performing work on the Project in conjunction with it. As such, the Contractor shall afford the Owner's own forces and other Contractors or Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.
- § 6.2.1.1 The Contractor shall not commit or permit any act which will interfere with the performance of the work of any other Contractor or Separate Contractor performing work on the Project. If the Contractor sustains any damage through any act or omission of Separate or other Contractors having a contract with the Owner for the performance of work upon the site or of work which may be necessary to be performed for the proper execution of the work to be performed hereunder, or through any act or omission of a subcontractor of such Separate or other Contractor, the Contractor shall promptly notify the Owner and the Construction Manager of such damage
- § 6.2.1.2 To the fullest extent permitted by law, the Contractor agrees to defend, indemnify and hold harmless the Owner, Architect, Construction Manager, Consultants and Sub-consultants, from all claims made against any of them arising out of the Contractor's acts or omissions or the acts or omissions of any Subcontractor of the Contractor which have caused damage to the Owner, Architect, Construction Manager, Separate Contractor or other Contractor on the Project. The Owner's right to indemnification hereunder shall in no way be diminished, waived or discharged, or by the exercise of any other remedy provided for by the contract or by law. Further, the Owner shall withhold from the Contractor's Contract Sum an amount sufficient to cover such damage and all expenses and costs associated with the damage sustained.
- § 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner's own forces, Separate Contractors or other Contractors, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Construction Manager and Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor or other Contractors that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Construction Manager and the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's or other Contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractors or other Contractors that are not apparent.
- § 6.2.2.1 The Contractor shall promptly correct discrepancies or defects in its Work identified by Separate Contractors as affecting proper execution and results of the work of the Separate Contractors.
- § 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs, including costs that are payable to a Separate Contractors or to other Contractors, because of the Contractor's delays, improperly timed activities or defective construction.
- § 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction, or to property of the Owner, Separate Contractors, or other Contractors as provided in Section 10.2.5 or elsewhere in the Contract Documents.
- § 6.2.5 The Owner, Separate Contractors, and other Contractors shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

- § 6.2.6 Should the Contractor or its Subcontractors cause damage to the work or property of any Separate Contractor or other Multiple Prime Contractor, the Contractor shall, upon due notice, promptly attempt to settle by agreement or otherwise resolve the dispute with the Separate Contractor or other Multiple Prime Contractor. If such separate trade contractor or other Multiple Prime Contractor sues or makes any other claim against the Owner, Construction Manager, or Architect on account of any damage alleged to have been caused by the Contractor or its Subcontractors, the Contractor shall defend, indemnify, and hold harmless the Owner, Construction Manager, and Architect against such claim or proceedings at the Contractor's own expense. The Owner's right to indemnification hereunder shall in no way be diminished, waived or discharged, or by the exercise of any other remedy provided for by the Contract Documents or by law. Further, the Owner shall be entitled to withhold from the Contractor's Contract Sum an amount sufficient to cover such damage and all expenses and costs associated with the damage sustained.
- § 6.2.7 When the Work of the Contractor or its Subcontractors overlap or dovetail with that of other Contractors, materials shall be delivered and operations conducted to carry on the Work continuously, in an efficient, workmanlike manner.
- § 6.2.8 In case of interference between the operations of the Contractor and other Contractors, the Construction Manager will be the sole judge of the rights of each contractor and shall have the authority to decide in what manner the Work may proceed, and in all cases its decision shall be final. Any decision as to the method and times of conducting the Work or the use of space as required in this paragraph shall not be basis of any claim for delay or damages by the Contractor.
- § 6.2.9 The Contractor, including its Subcontractors, shall keep itself informed of the progress of other Contractors and shall notify the Architect or the Construction Manager immediately in writing of lack of progress on the part of other Contractors where such delay will interfere with its own operations. Failure of the Contractor to keep informed of the work progressing on the Project and failure to give notice of lack of progress by others shall be construed as acceptance by the Contractor of the status of the work as being satisfactory for proper coordination with the Contractor's Work.
- § 6.2.10 Delays or oversights on the part of the Contractor or its Subcontractors in getting any or all of the Work done in the proper way, thereby causing cutting, removing and replacing Work already in place, shall not be the basis for a claim for either an increase in the Contract Sum or Contract Time.
- § 6.2.11 The Contractor shall promptly correct discrepancies or defects in its Work which have been identified by Separate Contractor(s) or other Contractor(s) as affecting proper execution and results of the work of such Separate Contractor(s) or other Contractor(s).

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, other Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Construction Manager, with notice to the Architect, will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

- § 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, only by Change Order, Construction Change Directive or field order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents. The Owner may in its sole discretion reduce the scope of the Contractor's Contract with or without any specific reasons therefor.
- § 7.1.2 A Change Order shall be based upon agreement among the Owner, Construction Manager, Architect and Contractor; a Construction Change Directive requires agreement by the Owner, Construction Manager and Architect and may or may not be agreed to by the Contractor; a field order for a minor change in the Work may be issued by the Architect alone.
- § 7.1.2.1 Field orders are an interpretation of the Drawings or Specifications which order minor changes in the Contractor's work which will not result in an increase or decrease in the Contract Sum. From time to time, the

Architect may issue field orders to the Contractor. The work included in such field order shall be performed by the Contractor at no additional cost to the Owner and shall not form the basis for a claim for an extension of the Contract Time. Hence, the Contractor shall perform the work included in field orders so as to cause no delay to its Work and/or the work of other Contractors or Separate Contractors engaged by the Owner in connection with the Project. All field orders shall be given to the Contractor and the Construction Manager by the Architect in writing.

- § 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or field order for a minor change in the Work. Additional work performed without authorization of a Change Order will not entitle the Contractor to an increase in the Contract Sum or an extension of the Contract Time. No course of conduct or prior dealings between the parties, nor express or implied acceptance of alterations or additions to the Work, and no claim that the Owner has been unjustly enriched by any alteration or addition to the Work, whether or not there is, in fact, any unjust enrichment of the Owner, shall be the basis for any claim to an increase in any amounts due under the Contract Documents or a change in any time period provided for in the Contract Documents. No amount shall be payable by the Owner to the Contractor for performance of work without a written and fully executed Change Order.
- § 7.1.4 Costs for changes in the Work shall not be allowed in excess of usual rentals charged in the area where the Project is located for similar equipment of like size and condition, including costs of necessary supplies and repairs for operating equipment on site in connection with other work unless its use incurs actual and additional costs to Contractor. If equipment not on Site is required for change in work only, cost of transporting equipment to and from Site will be allowed.
- § 7.1.5 When the Owner or Architect (in association with the Construction Manager) request that the Contractor perform work which is not included in the Contract Drawings or Specifications and which will result in additional cost to the Owner, the Architect shall request that the Contractor submit its proposal for performing such additional work. The Contractor shall submit its proposal to the Construction Manager and Architect for review. The Contractor's proposal shall include a complete itemization of the costs associated with performing its work including labor and materials. All proposals for any work that a Contractor, its Subcontractor(s) or Sub-subcontractor(s) perform in connection with additional work shall be properly itemized and supported by sufficient substantiating data, including but not limited to material descriptions, material quantities, material unit prices, labor trade listings, labor hour quantities, labor trade rates, equipment descriptions and equipment rates with a percentage allowance for overhead and profit as set forth in Section 7.3.11. The Contractor's proposal shall also set forth the impact on the milestone and critical path dates set forth in the Contract Documents, the construction schedule and the Project schedule, which would result from implementation of the change, and be accompanied by such other information as the Owner may request.
- § 7.1.6 Overtime, when specifically authorized by the Owner in writing, and not as a corrective measure by the Contractor to expedite the progress of construction as ordered by the Owner based on its determination that the performance of the Work has not progressed to the level of completion required by the approved Schedule, shall be paid for by the Owner on the basis of premium payment only, plus the cost of insurance and taxes based on the premium payment period. Overhead and profit will not be paid by the Owner for overtime.
- § 7.1.7 Unit prices shall be submitted in the Bid Form for various items as set forth therein, and are subject to approval and acceptance by the Owner. The Owner reserves the right to reject any unit price which is unreasonable or unbalanced, as compared with prevailing costs, or as compared with the unit prices submitted by other bidders for the Project. Approved unit prices quoted shall include all profit, overhead, bonds, insurance, labor, materials, equipment, tools, applicable taxes necessary to complete the work item and shall apply to all work added or work deducted.

§ 7.2 Change Orders

- § 7.2.1 A Change Order is a written instrument prepared by the Construction Manager and signed by the Owner, Construction Manager, Architect, and Contractor, stating their agreement upon all of the following:
 - The change in the Work;
 - .2 The amount of the adjustment, if any, in the Contract Sum; and
 - The extent of the adjustment, if any, in the Contract Time.

- § 7.2.1.4 Changes in the Work involving additional Work or deletion of Work effecting an addition to or subtraction from the Contract Sum shall not be made until the Contractor submits to the Architect and Construction Manager the cost of the added or deleted Work with a complete and detailed listing of all Subcontractors involved, all materials, labor, overhead and profit, the impact on the Contract Time, and an appropriate Change Order has been issued. If requested, the Contractor shall submit detailed quotations for Subcontractors and material suppliers. Changes in the Work when not involving additions or deletions from the Contract Sum shall not be made until the Architect has issued an appropriate Change Order. All Change Orders must have the approval of the Owner, Construction Manager and Architect in writing. No change in Contract Time shall be allowed for Change Orders, except for substantial changes in scope determined by the Owner. In the case of increased scope, it is expected that Change Order work shall be performed by increased manpower.
- § 7.2.2 Methods used in determining adjustments to the Contract Sum may include those listed in Section 7.3.3. The Owner shall have the right to select the method of pricing to be used by the Contractor.
- § 7.2.3 Agreement on any Change Order shall constitute a final settlement of all Claims and other matters related to the change in Work that is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change (including, without limitation, all costs of associated delay, interference, acceleration, inefficiency, overhead, as well as costs of material, labor and supervision), and any and all adjustments to the Contract Sum and the Contract Time. Payment of a Change Order shall constitute accord and satisfaction of all Claims of the Contractor in connection with the change or changes to the Contract addressed by the Change Order and it is understood and agreed that a signed Change Order shall be the complete and fully integrated agreement for all related costs and there are no oral or written understandings, reservations, representations or agreements, directly or indirectly, connected with the Change Order and not affirmatively stated on the signed Change Order. In the event a Change Order increases the Contract Sum, the Contractor shall include the Work covered by such Change Orders in Applications for Payments as if such Work were originally part of the Contract Documents.
- § 7.2.4 Upon the Contractor's completion of the Change Order work, and prior to payment being made to the Contractor for such work, the Contractor shall provide the Owner with the following information:
 - Certified payrolls itemizing the labor actually utilized in connection with the Change Order work; and
 - Copies of invoices from its Subcontractors supplying work in connection with the Change Order work.
- § 7.2.5 Additional work performed without authorization of a Change Order will not entitle the Contractor to an increase in the Contract Sum or an extension of the Contract Time, except at provided in Section 7.3, and except in the case of an emergency as provided in Section 10.4.

§ 7.3 Construction Change Directives

- § 7.3.1 A Construction Change Directive is a written order prepared by the Construction Manager and signed by the Owner, Construction Manager and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.
- § 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order or to direct the Contractor to remedy its nonconforming or defective Work. In the event the Contractor and the Owner cannot agree on the sum by which the Contract Sum or the amount of time by which the Contract Time is to be increased or reduced based upon changes to the scope of the Work as described in Article 7, or due to the Contractor's failure to perform the Work in accordance with the Contract Documents, the Architect or Construction Manager shall issue a Construction Change Directive directing the Contractor to proceed with the disputed Work or correct defective Work and, if applicable, reflecting the addition to or reduction of the scope of the Contractor's Contract and the corresponding change in the Contract Sum or Contract Time, if any.
- § 7.3.2.1 If the Owner and the Contractor cannot agree that the requested Work properly forms the basis for a Change Order or on the sum by which the Contract is to be increased or reduced based upon changes to the scope of Work, the Architect or Construction Manager shall issue a Construction Change Directive signed by the Owner, Construction Manager and Architect reflecting the addition to, or removal of, the scope of Work and the Contractor shall (a) in the case of additional work to be performed by the Contractor, perform such additional work in an expeditious manner so as not to delay the Work of the Contractor or other Contractors working at the site and keep records of its performance

of such additional work, and (b) in the case of work to be removed from the scope of the Contractor's Work, refrain from taking any steps in connection with the work associated with the deduction of the Contractor's Work. The Construction Change Directive shall include: (a) a description of the work being added or removed from the Contractor's scope of Work; (b) the amount the Owner has determined to be the cost associated with the additional work (as those costs are identified and limited in Section 7.3.4) or removal of the scope of the Contractor's Work until the Owner and the Contractor agree upon the increase or decrease in the Contractor's Contract Sum, or until a claim filed by the Contractor has been determined; and (c) the extent to which the Contract Time will be adjusted as a result of the change in the scope of Work. Any claims must be filed in accordance with the requirements set forth in Article 15 of these General Conditions. Failure to timely file any claim in accordance with requirements set forth therein shall constitute a waiver of such claim.

- § 7.3.3 If the Construction Change Directive provides for a method for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:
 - Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to .1 permit evaluation:
 - .2 Unit prices stated in the Contract Documents or subsequently agreed upon (unit prices shall be deemed to include all costs and expenses for the Contractor's changed Work, including costs of general conditions, insurance/bonds and overhead and profit attributable to the change);
 - .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee subject to the limitations of Section 7.3.11;
 - .4 As provided in Section 7.3.4 subject to the limitations of Section 7.3.11; or
 - .5 As provided in Section 7.3.2.1.
- § 7.3.4 If the Construction Change Directive provides for a reasonable expenditure and savings method of adjusting the Contract Sum, the Construction Manager shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in Section 7.3.11. In such case, the Contractor shall keep and present, in such form as the Construction Manager may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:
 - .1 Actual costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers compensation insurance;
 - .2 Actual costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed. Sales taxes, if any are required, shall be indicated and added after the cost of the change is calculated. No overhead or profit will be paid on sales tax;
 - .3 Actual rental costs of machinery and equipment, exclusive of hand tools, rented from third parties; and
 - Actual costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the additional work. The Contractor shall submit with its proposal actual invoices from its insurance broker reflecting actual additional costs associated with the procurement of bonds and insurance. Bond premiums and/or credits shall be invoiced per Change Order. Lump sum bond premium requests will not be considered at the end of the Project.
- § 7.3.5 If the Contractor disagrees with the adjustment in the Contract Sum or Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.
- § 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction Manager of the Contractor's agreement or disagreement with (1) the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time or (2) the amount of the increase or decrease in the Contract Sum and Contract Time as provided in Section 7.3.2.1. Any claims must be filed in accordance with the requirements set forth in Article 15 of these General Conditions. Failure to timely file any claim in accordance with requirements set forth therein shall constitute a waiver of such claim.
- § 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

- § 7.3.8 When the Owner or Architect request that portions of the Contractor's Work originally included in the Drawings or Specifications be deleted and which will result in a reduction of the Contract Sum, the Architect shall request that the Contractor submit its proposal for deleting the scope of such Work from the Contract. The Contractor's proposal shall include a complete itemization of the costs associated with deducting such Work including labor, materials, overhead and profit. The Contractor shall not be entitled to retain its overhead or profit for such work nor shall any of its Subcontractors which were to perform the work being deducted from the Contractor's scope of Work. Additionally, the Contractor shall reflect the reduced cost of premiums on bonds which are to be supplied herein as a result of such change. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.
- § 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Construction Manager and Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Construction Manager and Architect determine to be reasonably justified. The interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.
- § 7.3.10 When the Owner and Contractor agree with a determination made by the Construction Manager and Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Construction Manager shall prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.
- § 7.3.11 The limit for the combined overhead and profit included in the total cost to the Owner shall be based on the following schedule:
 - .1 For the Contractor, for Work performed by the Contractor's own forces, fifteen percent (15%) of the direct cost for labor and materials.
 - .2 For the Contractor, for Work performed by the Contractor's Subcontractor, maximum of five percent (5%) of the amount due the Subcontractor for the Contractor's overhead and profit. For the Subcontractor, for Work performed by the Subcontractor's own forces, ten percent (10%) of the direct cost for labor and materials. The total combined overhead and profit for a change order shall be limited to 15% of the direct cost regardless if the Work is performed by the Contractor or the Subcontractor.
 - .3 The markup on any part of the Work a Subcontractor subcontracts will be limited to one overhead and profit figure, in addition to the Contractor's overhead and profit markup. The Subcontractor and Sub-subcontractor may divide the overhead and profit amount as they agree upon.
 - .4 Costs to which overhead and profit is to be applied shall be determined in accordance with Section 7.3.4.
 - .5 In order to facilitate checking of quotations for extras and credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials, and subcontracts. Labor and material shall be itemized in the manner prescribed above. Where major cost items are subcontracts, they shall be itemized also.
 - The overhead and profit mark-up includes, but is not be limited to, the following:
 - .1 home office expense;
 - .2 field office expense;
 - .3 supervision;
 - .4 project management & estimation;
 - .5 small tools & equipment;
 - .6 research & layout;
 - .7 inspections & permits;
 - .8 material handing;
 - .9 record drawings: and
 - .10 safety and cleanup

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the

Contract Sum or Contract Time, the Contractor shall notify the Construction Manager and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Construction Manager that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

- § 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.
- § 8.1.2 The date of commencement of the Work is the date established in the Agreement. The date shall not be postponed or extended by the failure to act of the Contractor or persons or entities for whom the Contractor is responsible to act.
- § 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8. The date of final completion is the date certified by the Architect and Owner in accordance with Section 9.10. Unless otherwise agreed in writing by the Owner, the Contractor agrees that Final Completion shall occur not more than 30 calendar days after the date of Substantial Completion.
- § 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.
- § 8.1.5 Work remaining to be completed after Substantial Completion, shall be limited to items which can ordinarily be completed within a thirty (30) day period (one month) before final payment is made.

§ 8.2 Progress and Completion

- § 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.
- § 8.2.1.1 The Contractor recognizes that the Project Schedule is of critical importance to the Owner and that failure by the Contractor to complete the Work in accordance with the construction schedule may cause significant damages to the Owner, including but not limited to the loss of State Aid from the State Department of Education. All aspects of construction must reflect a "time is of the essence" construction strategy. The "Bid Schedules" serve as a guide of critical milestone dates to the Project. Failure to meet intermediate milestone dates will jeopardize the overall Project Schedule. If the Contractor's performance of the Work demonstrates, to the Owner, Construction Manager or Architect, that timely completion may be in jeopardy, this will mandate the Contractor to increase staff, work overtime, or use other means to recover time, at the costs of the Contractor responsible for such delays. In addition, all costs due to delays in completion of the Work shall be borne by Contractor(s) responsible for delays.
- § 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner and the Owner's approval of such insurance. The date of commencement of the Work shall not be changed by the effective date of such insurance. The Work can not start until the required insurance and bonds are provided and the Contract has been executed.
- § 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion and final completion within the Contract Time. The Contractor agrees that the Work shall be prosecuted regularly, diligently and uninterruptedly at such rate of progress as will ensure full completion thereof within the Contract Time specified and, further, to provide such protections as may be necessary. It is expressly understood and agreed by the Contractor that the time for the substantial and final completion of the Work is a reasonable time for its completion, taking into consideration, among other things, the average climatic range and usual weather conditions prevailing in the Project's locality. The Contractor shall cooperate with the Owner, Architect, and other Contractors on the Project, making every reasonable effort to reduce the Contract Time.
- § 8.2.4 In no case shall the Contractor delay the progress of the Work, or any part thereof, on account of changes in the Work or disputes caused by proposed or ordered changes in the Work (including the equitable value of the changes), or any disputes or disagreements as to the Work or extra work.

- § 8.2.5 If the Contractor is not maintaining the pace of the Work in accordance with the approved construction schedule or otherwise consistent with the Contract Time, and such delays are not excusable as set forth in Section 8.3, then the Owner may require the Contractor to undertake a time recovery plan (including more personnel, overtime and/or additional shifts) at the Contractor's sole expense, to reasonably assure substantial and final completion of the Work within the Contract Time.
- § 8.2.6 In the event the Contractor fails to complete all Work under this Contract by said scheduled dates, the Contractor will not be permitted to perform any work during normal school hours without the express written authorization of the Owner. Such Work shall only be performed after school hours, Saturdays, Sundays, holidays or periods when school is unoccupied at no additional cost of any kind to the Owner. In addition to damages incurred by the Owner in connection with the Contractor's delay, the Contractor shall be liable for all costs incurred by the Owner to provide staff, Architect and Construction Manager personnel as required to make facility accessible by Contractor and perform inspections during such off hours.
- § 8.2.7 The Contractor understands that in order to meet the requirements of the Project schedule, including intermittent milestone and critical path dates set forth in the Contract Documents, it may be required to work its personnel and equipment overtime on regular workdays and on Saturdays and holidays, the cost of which is included in the Contract Sum. If the Owner specifically approves in writing reimbursement for overtime, the Contractor shall be paid by the Owner on the basis of the premium payment.
- § 8.2.7.1 The Contractor may request access to the site during times beyond the work hours permitted. Approval is solely at the discretion of the Owner. If approval is given, the Contractor is responsible for paying all additional costs incurred by the Owner, Architect and Construction Manager for providing the site to the Contractor during the additional time periods.
- § 8.2.8 The Owner shall have the right at any time to modify the Project Schedule; to suspend, delay or accelerate, in whole or in part, the commencement or execution of the Work or any potion thereof or to vary the sequence thereof; and to prescribe the time, order and priority of the various portions of the Work, and all other matters relating to the scheduling of the Work. The Contractor shall not be entitled to additional compensation for any such decisions made by the Owner.
- § 8.2.9 The Owner may request the Contractor to work overtime to expedite the completion of the Work or a portion of the Work, at a time when the Contractor is not behind schedule or otherwise in default of any of the provisions of the Contract. The Contractor agrees to work said overtime, and the Contractor shall be reimbursed only for the Contractor's extra labor cost over the amount of regular time during the period of such overtime, including additional fringe benefit costs, insurance and taxes incurred by it with respect thereto and only those other actual costs of the Contractor directly related to said overtime, which have been approved in advance by the Owner. Time slips covering said overtime must be submitted to the Owner on a daily basis for checking and approval. The Contractor shall not be compensated for any lost efficiency or production alleged to have resulted from said overtime work.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed in the commencement or progress of the Work as a result of: Acts of God (such as tornado, flood, hurricane, pandemics, epidemics, etc. making performance temporarily impossible); the negligent acts or omissions of the Owner, Architect, Construction Manager, other Contractors, or their agents or employees; strikes, lockouts or other labor disturbances (not arising from the labor practices of Contractor or its Subcontractors, Suppliers, or Sub-subcontractors to comply with their obligations arising under the Contract); unusually adverse weather conditions; freight embargoes (provided that delays by the Contractor, its Subcontractors, Sub-subcontractors or Suppliers do not constitute an excusable cause of delay); changes in the work to be performed by the Contractor (not caused or resulting from the failure of the Contractor or its Subcontractors, Suppliers or Sub-subcontractors); or changes to laws or regulations after the effective date of the Contract, provided the Contractor has used all reasonable efforts to mitigate the foregoing causes; then the Contractor shall be entitled to a day for day extension of the Contract Time for the established delay to the critical path of the Work subject to the provisions of this Article 8 and Article 15. All other delays of the Project, including but not limited to, Architect review and/or approval of shop drawings or other submittals, requests for information, clarifications, samples, and change orders; Owner schedule; Architect certification of payment; payment by Owner of Contractor's Application for Payment; coordination among the Multiple Prime Contractors; unavailability of materials and/or equipment; surveying/testing; closeout, etc. are deemed

to be foreseeable and contemplated and, therefore, shall not form the basis for a claim for an extension of time or additional compensation by the Contractor. The extension of time provided under this Section 8.3.1 shall be the Contractor's exclusive remedy.

- § 8.3.1.1 The Contractor further acknowledges and agrees that adjustments in the Contract Time will be permitted for a delay only to the extent such delay (1) is not caused or could not have been anticipated by the Contractor, (2) could not be limited or avoided by the Contractor's timely notice to the Owner of the delay or reasonable likelihood that a delay will occur, and (3) is of a duration of more than one (1) day.
- § 8.3.1.2 The Contractor's inability to secure sufficient personnel for the performance of the Work shall not constitute a basis for an extension of time. The Contractor shall not be entitled to an extension of time if the Architect or Construction Manager stops the Work due to the existence of or reasonable suspicion of a deficiency in the Work.
- § 8.3.1.3 An extension of the Contract Time, if requested by the Contractor, shall only be considered after the Contractor has made reasonable effort to recover the lost time. An extension, or extensions, of time may be granted subject to the provisions of this Article 8, but only after written application therefore by the Contractor. An extension of time shall be only for the number of days of delay which the Architect may determine to be due solely to the causes set forth in the application for extension of time. The Contractor shall not be entitled to receive a separate extension of time for each one of several causes of delay operating concurrently; but if at all, only the actual period of delay as determined by the Construction Manager or Architect.
- § 8.3.1.4 All requests for additional time shall be made in writing, delivered to the Construction Manager within five (5) calendar days from the time when the circumstance with potential for delay becomes reasonably known to the Contractor, supported by documentation which demonstrates to the Architect and Construction Manager's satisfaction that the critical path of the Work has been significantly altered by the delays to the activities in question through no fault of the Contractor or anyone for whom the Contractor is responsible, and that the Project schedule cannot be maintained by re-ordering other activities within the Project at no cost. This request shall also contain, at a minimum, the following information: (1) date of start of delay; (2) specific cause of delay; (3) effect of delay on construction progress; and (4) date of termination of delay. Upon receipt of the Contractor's request for an extension of time, the Owner will ascertain the facts and extent of the delay, and may, in its sole discretion, extend the time for completion of the Contractor's Work when in its judgment such an extension is justified. The Owner's determination will be final and binding in any litigation commenced by the Contractor against the Owner which arises out of the Owner's denial of an extension of time to the Contractor. Any approval of an extension of the Contractor's time to complete its Work shall be memorialized by written change order, signed by the Owner, Contractor, Architect and Construction Manager. When the Owner determines that the Contractor will be granted an extension of time, such extension shall be computed in accordance with the following: for each day of delay in the completion of its Work, the Contractor shall be allowed one day of additional time to complete its Contract. The Contractor shall not be entitled to receive a separate extension of time for each one of several causes of delay operating concurrently; rather, only the actual period of delay as determined by the Owner or its Architect may be allowed.
- § 8.3.1.5 Failure of the Contractor to give written notice as required by Section 8.3.1.4 or to strictly comply with the requirements of Article 8 shall be deemed conclusively to be a waiver and release of such claim, and such notice shall be a condition precedent to the Contractor's right to make a claim for any claim arising out of, under or in connection with the Contractor or the performance of the Work.
- § 8.3.2 Notwithstanding anything to the contrary in the Contract Documents, an extension in the Contract Time, to the extent permitted and justified under Section 8.3.1, shall be the sole remedy of the Contractor for, and the Contractor waives its right to any claim for damages to the extent arising from, any (1) delay in the commencement, prosecution, or completion of the Work; (2) hindrance or obstruction in the performance of the Work; (3) loss of productivity or acceleration; or (4) other claims for disruption, interference, inefficiencies, impedance, hindrance, acceleration, resequencing, schedule impacts, lack of timeliness by the Owner or its consultants, and lack of coordination, errors or omissions in the design of the Project, cumulative impact of multiple change orders, unavailability of labor, materials or equipment, delays and other impacts (collective referred to herein as "Delay(s)"). In no event shall the Contractor be entitled to any compensation or recovery of any damages in connection with any Delay, including, but not limited to, delay costs, loss of productivity or efficiency, lost profits, extended jobsite general conditions and home office overhead, consequential damages, lost opportunity costs, impact damages, or other similar remuneration. The Owner's exercise of any of its rights or remedies under the Contract Documents (including, but not limited to, ordering

changes in the Work, or directing suspension, rescheduling or correction of the Work), regardless of the extent or frequency of the Owner's exercise of such rights or remedies, shall not be construed as interference, hindrance or obstruction with the Contractor's performance of the Work and shall not entitle the Contractor to any additional compensation. The Contractor shall include a no-damages-for-delay clause in all subcontracts for the performance of the Work.

- § 8.3.3 Delays that affect the scheduled completion of the Work and are attributable to interference between Multiple Prime Contractors, Separate Contractors, Subcontractors, suppliers, utility companies or municipalities, shall be compensated solely by the granting of an extension of time to the Contractor by the Owner to complete the Work without charges to the Owner. The parties acknowledge that the Contract Time takes into account the time necessary for review of submittals and shop drawings, correcting design errors or omissions, coordination amongst Multiple Prime Contractors and Separate Contractors, change orders, delays incurred by seasonal limitations, work by utilities, and other administrative processing by all parties involved and are not compensatory. The Contractor agrees that it has included in its Bid prices the additional cost of doing work under this Contract caused by interference of the Architect, Construction Manager, other Multiple Prime Contractors, Separate Contractors, Subcontractors, utility companies, etc. and the other non-compensatory Delays described above.
- § 8.3.4 When the Contract Time has been extended, as provided under Section 8.3, such extension of time shall not be considered as justifying extra compensation to the Contractor for administrative costs, home office, estimating, extended general conditions or other similar impact costs. The Contractor acknowledges that in agreeing to the Contract Sum it assessed the potential impact of the limitations in Section 8.3.2 on its ability to recover additional compensation in connection with a Work delay, interference, impact or hindrance and agrees that those limitations shall apply regardless of the accuracy of the Contractor's assessment or actual costs incurred by the Contractor.
- § 8.3.5 If the Contractor submits a progress report indicating, or otherwise expresses an intention to achieve, completion of the Work prior to any completion date required by the Contract Documents or expiration of the Contract Time, no liability of the Owner to the Contractor for any failure of the Contractor to so complete the Work shall be created or implied.
- § 8.3.6 The intent of the Contract is for Work to follow a logical sequence. The Contractor, however, may be required by the Owner, Construction Manager or Architect to temporarily omit or leave out any section of Work or perform Work out of sequence. Out of sequence work and come back time to these areas shall be performed at no additional cost to the Owner.
- § 8.3.7 Claims relating to Contract Time shall be made in accordance with applicable provisions of Article 15.
- § 8.3.8 The Contractor understands that the timely prosecution of its obligations under the Contract is essential to the efficient completion of the Project and may have a direct bearing on the costs incurred by all other Contractors and Separate Contractors. The Contractor's obligations in this regard include, but are not limited to: 1) completing the Work in an orderly fashion and in accordance with an agreed upon progress schedule; 2) timely coordination and cooperation with the Owner, the Architect and the other Contractors and Separate Contractors to resolve disruptions, interferences or other problems as they arise; 3) providing sufficient personnel, systems and procedures to ensure that required materials, supplies and skilled human resources are available so that the Work is timely understood, anticipated, progressed and communicated where required to others involved with the Project; 4) maintaining accurate job progress schedules and systems; 5) timely notifying others working on the site when delays or interferences occur that will affect the Contractor's or other's work pertaining to the Project; 6) providing a skilled, informed and properly supported superintendent at the Project sites and at all required job meetings to provide meaningful information and commitments to efficiently cooperate in coordinating the work of the various contractors; and 7) timely reviewing all iob minutes, correspondence and other communications and responding to same when required.
- § 8.3.9 The Contractor agrees that its failure to timely cooperate and proceed can substantially increase the costs of other Contractors and Separate Contractors in attempting to timely prosecute their obligations under related contracts. Accordingly, the Contractor recognizes that other Contractors and Separate Contractors on the site are third-party beneficiaries of the Contractor's obligation to timely coordinate and prosecute its obligations under the Contract Documents. The Contractor hereby waives and shall not raise as a defense the absence of privity of contract between the Contractor and the other Contractors and Separate Contractors in any claim hereafter asserted by other Contractors or Separate Contractors to recover costs or damages for delay or interference and shall be responsible to other

Contractors and Separate Contractors on the site for damages caused by the Contractor's failure to timely and properly perform its contractual obligations under the Contract Documents.

§ 8.4 Liquidated Damages

§ 8.4.1 The Contractor realizes that time is of the essence on this Contract and the Construction Schedule shall be submitted per the requirements of the Contract Documents. In the event the Contractor fails to submit a Construction Schedule by said date, the sum per calendar day of THREE HUNDRED DOLLARS (\$300.00) will be subtracted from the Contract Sum due the Contractor in the form of a change order.

§ 8.4.2 The Contractor realizes that time is of the essence on this Contract and the completion date for any work or the date of Substantial Completion shall be no later than the date indicated in these Contract Documents. The Contractor understands that the substantial disruption of the Owner's educational process will occur if the project is not completed by the dates outlined in Division 1 of the Specifications. In the event that the Contractor fails to complete any work or substantially complete the work under the Contract by the date that is thirty (30) days after the scheduled date(s) of Substantial Completion, the sum per calendar day of ONE THOUSAND DOLLARS (\$1,000.00) will be deducted from the Contract Sum due the Contractor in the form of a change order or construction change directive, except in cases where a delay is due to unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including acts of God, or of the Public enemy, acts of the government, in either sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, freight embargos, or delays of Subcontractors or suppliers due to such causes. Delays in acquisition of materials other than by reason of freight embargoes will not constitute a delay excusable under this provision unless approved by the Owner in advance and in writing.

Within five (5) calendar days from the occurrence of any such delay, the Contractor shall notify the Owner in writing the cause of delay. The Owner will ascertain the facts and extent of the delay, and extend the time for completing the Work when in his judgment the findings of fact justify such an extension. The Owner's findings of fact will be final and binding on any litigation.

The said sum per calendar day shall constitute the Liquidated Damages incurred by the Owner for each day of delay beyond thirty (30) days after the agreed upon date(s) of Substantial Completion. Such Liquidated Damages shall be in addition to any other damages (other than by reason of delay) the Owner may incur as a result of the Contractor's breach of Contract. In the event the Contractor fails to complete all work under this Contract by said scheduled dates, the Contractor will not be permitted to perform any work during regular school hours. Such work shall only be performed after regular school hours, Saturdays, Sundays, holidays or periods when school is unoccupied at no additional cost of any kind to the Owner. In addition to Liquidated Damages, the Contractor shall be liable for all additional costs incurred by the Owner after the Substantial Completion Date (as well as Milestone Dates) stated in the Contract Documents for its own employees to make the Owner's property and facilities accessible to the Contractor beyond regular school hours and incurred by the Owner for Construction Manager services and Architect services performed for the Project due to the Contractor's failure to complete its work by the Substantial Completion Date (and Milestone Date) stated in the Contract Documents, including but not limited to the additional costs incurred for extending the duration of their services and for performing inspections after regular school hours or on Saturdays, Sundays or holidays.

All costs incurred by the Owner, Owner's Representative, Architect, Architect's consultants, for the cost of additional inspections, at the rate of ONE THOUSAND DOLLARS (\$1,000.00) per inspection or more due to time requirements, will be subtracted from payment due the Contractor. If the amount due the Contractor for payment is insufficient, any deficiency shall be paid by the Contractor to the Owner. Additionally, a cost of \$750 per day for extended Construction Management time will be charged to the Contractor causing the delay.

§ 8.4.3 Notwithstanding the foregoing, if one or more of the liquidated damages provisions set out in the Agreement are held to be legally unenforceable as a penalty, the Owner shall be allowed to recover actual damages caused by the Contractor's failure to achieve the applicable Contract Time requirements.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. Notwithstanding anything to the contrary contained in the Contract Documents, the Owner may withhold or offset any payment to the

Contractor if and for so long as the Contractor fails to perform any of its obligations under any of the Contract Documents; provided, however, that any such holdbacks shall be limited to an amount sufficient in the reasonable opinion of the Owner to cure any default or failure of performance by the Contractor.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

- § 9.2.1 Within 30 days of Contract Award, the Contractor shall submit to the Construction Manager a schedule of values allocated to various portions of the Work for each building, prepared in the currently authorized form of AIA Document G703 Continuation Sheet and supported by such data to substantiate its accuracy as the Construction Manager and Architect may require. This schedule, unless objected to by the Construction Manager or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. The schedule of values shall state the names of all Subcontractors, Sub-subcontractors and material suppliers and the amounts to become due to each breakdown by specification section. The schedule of values shall contain, along with individual work items, separate line items for (1) mobilization, bonds, insurance, etc., (2) value of administrative close out submittals, (3) Allowance(s) if required elsewhere in the Project Manual, (4) separate subtotals by building, and (5) buildings further separated between "Additions/New Construction" and "Renovations/Reconstruction" as applicable. At the direction of the Architect, it shall include quantities, if applicable. The total for all items shall aggregate the Contract Sum.
- § 9.2.2 Any schedule of values that fails to include sufficient detail, is unbalanced or exhibits "front loading" of the value of the Contractor's Work will be rejected. Furthermore, if the schedule of values has been approved by the Construction Manager and the Architect and is subsequently used, but later is found by the Construction Manager or Architect to be improper for any reason, sufficient funds shall be withheld from the Contractor's future applications for payment to ensure an adequate reserve (exclusive of normal retainage) to complete the Contractor's Work.
- § 9.2.3 The schedule of values shall be drafted so as to reflect multiple construction sites, multiple locations within each site, additions versus renovations of work, and the like so as to satisfy any New York State Education Department requirements for the Project.

§ 9.3 Applications for Payment

- § 9.3.1 In accordance with Article 5 of the Agreement and the Payment Procedures in the Specifications, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, notarized and reflecting retainage as provided elsewhere in the Contract Documents. Applications for Payment will be in the currently authorized form of AIA Document G732 2019, "Application and Certificate for Payment," accompanied by AIA Document G703-1992, "Continuation Sheet," and must include (add and/or deduct) adjustments to the Contract Sum resulting from Work performed under approved Change Orders (specified under Article 7) and shall be shown separately on the application for previous and current periods. Each Application and Certificate of Payment shall be accompanied by two (2) copies of the Pay Application Lien Waiver and Release in the form set forth in the Payment Procedures in the Specifications, certified payroll for employees of the Contractor and employees of Subcontractors performing work on the Project, and such other information required by the Owner. Each Application for Payment shall be prepared in such form and supported by such data to substantiate the Contractor's right to payments as the Owner, Construction Manager or Architect may require such as copies of requisitions from Subcontractor and material suppliers. Each Application for Payment forwarded to the Owner by the Construction Manager or Architect shall be subject to audit and approval by the Owner in accordance with the Owner's normal audit.
- § 9.3.1.1 The Construction Manager and Architect shall review the application for payment submitted by the Contractor and shall advise the Contractor of any adjustments to be made thereto. The Construction Manager and/or the Architect may make such adjustments under the circumstances set forth in Section 9.5.1. If any such adjustments are made by the Architect or Construction Manager, the Contractor shall submit an original itemized revised application with all documentation required by Section 9.3.1.
- § 9.3.1.2 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Construction Manager and Architect, but not yet included in Change Orders.

- § 9.3.1.3 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier unless such Work has been performed by others whom the Contractor intends to pay.
- § 9.3.1.4 Until Substantial Completion, the Owner shall pay ninety-five percent (95%) of the amount due the Contractor on account of progress payments, less an amount necessary to satisfy any claims, liens, or judgments against Contractor, which have not been suitably discharged. In accordance with Section 9.8.5, the Owner shall pay the entire amount retained from previous progress payments less two (2) times the amount required to complete items identified in a list prepared in accordance with Section 9.8.2 and the amount required to satisfy any outstanding claims, liens, or judgments against the Contractor.
- § 9.3.1.5 The Contractor and its Subcontractors are required to submit certified payroll information to the Owner in accordance with New York State Law.
- § 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the Project site for subsequent incorporation in the Work. If approved in advance in writing by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest. The costs of applicable insurance, storage, and transportation to the site for such materials and equipment stored off the site shall not increase the Contract Sum.
- § 9.3.2.1 Payment may be made for materials and equipment delivered and suitably stored on-site for future incorporation in the Work, subject to the following conditions:
 - Request for payment shall be considered for material or equipment, which is in short or critical supply, which has been specially fabricated for the Project or, at the discretion of the Construction Manager and Architect, for other materials or equipment.
 - A request for payment of material stored on-site must be made by the Contractor ten (10) days prior to .2 actual, monthly cut-off date for Payment Applications.
 - .3 Procedures required by the Owner shall include, but not necessarily limited to, submission by the Contractor to the Construction Manager and Architect of bills of sale and bills of lading for such materials and equipment, provisions of opportunity for the Construction Manager's and Architect's visual verification that such materials and equipment are in fact in storage; and, if stored off-site, submission by the Contractor of verification that such materials and equipment are stored in a bonded
 - All such materials and equipment, including materials and equipment stored on-site but not yet incorporated into the Work, upon which partial payments have been made shall become the property of the Owner, but the care and protection of such materials and equipment shall remain the responsibility of the Contractor until incorporation into the Work and accepted by the Owner at substantial completion, including maintaining insurance coverage on a replacement cost basis without voluntary deductible.
- § 9.3.2.2 Payment may be made for materials and equipment delivered and suitably stored off-site for future incorporation in the Work, subject to the following conditions:
 - The Contractor shall submit: a written validation by the Owner, Construction Manager or Architect that such materials are stored safely off site, in the quantities and condition stated by the Contractor; a copy of an invoice for the material and equipment; a bill of sale or equivalent indication of the quantity and value of the material or equipment; a written statement indicating the location and method of storage; and property insurance certificate or rider covering the specific material or equipment, which shall name the Owner as an additional insured party.
 - The Contractor shall submit a verification that such materials and equipment are stored in a bonded .2 warehouse.
 - .3 A request for payment of material stored off-site must be made by the Contractor 10 days prior to actual, monthly cut-off date for Payment Applications.

- All such materials and equipment upon which partial payments have been made shall become the property of the Owner, but the care and protection of such materials and equipment shall remain the responsibility of the contractor until incorporation into the Work and accepted by the Owner at substantial completion, including maintaining insurance coverage on a replacement cost basis without voluntary deductible.
- § 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.
- § 9.3.4 The Contractor further expressly undertakes to defend the Indemnitees (as defined previously in Section 3.18), at the Contractor's sole expense, against any actions, lawsuits or proceedings brought against Indemnitees as a result of liens filed against the Owner, the Work, the site of any of the Work, the Project site and any improvements thereon, payments due the Contractor or any portion of the property of any of the Indemnities (referred to collectively as liens in this Section 9.3.4). The Contractor hereby agrees to defend, indemnify, and hold Indemnitees harmless against any such liens or claims of lien and agrees to pay any judgment or lien resulting from any such actions, lawsuits, or proceedings.
- § 9.3.5 The Owner shall release any payments withheld due to a lien or a claim of lien if the Contractor obtains security acceptable to the Owner or a lien bond which is: (1) issued by a surety acceptable to the Owner, (2) in form and substance satisfactory to the Owner, and (3) in an amount not less than One Hundred Fifty percent (150%) of such lien claim. By posting a lien bond or other acceptable security, however, the Contractor shall not be relieved of any responsibilities or obligations under this Section 9.3, including, without limitation, the duty to defend and indemnify the Indemnities in an action on the lien, lien discharge bond or underlying debt. The cost of any premiums incurred in connection with such bonds and security shall be the responsibility of the Contractor and shall not be part of, or cause any adjustment to, the Contract Sum.
- § 9.3.6 Notwithstanding the foregoing, the Owner reserves the right to settle any disputed public improvement lien claim by payments to the lien claimant or by such other means as the Owner, in the Owner's sole discretion, determines is the most economical or advantageous method of settling the dispute. The Contractor shall promptly reimburse the Owner, upon demand, for any payments so made.

§ 9.4 Certificates for Payment

- § 9.4.1 The Construction Manager will, within seven (7) days after the Construction Manager's receipt of the Contractor's Application for Payment, review the Application, certify the amount the Construction Manager determines is due the Contractor, and forward the Contractor's Application and Certificate for Payment to the Architect. Within seven (7) days after the Architect receives the Contractor's Application for Payment from the Construction Manager, the Architect will either issue to the Owner a Certificate for Payment, with a copy to the Construction Manager, for such amount as the Architect determines is properly due, or notify the Construction Manager and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1. The Construction Manager will promptly forward to the Contractor the Architect's notice of withholding certification.
- § 9.4.2 Where there is more than one Contractor performing portions of the Project, the Construction Manager will, within seven (7) days after the Construction Manager receives all of the Contractors' Applications for Payment: (1) review the Applications and certify the amount the Construction Manager determines is due each of the Contractors; (2) prepare a Summary of Contractors' Applications for Payment by combining information from each Contractor's application with information from similar applications for progress payments from the other Contractors; (3) prepare a Project Application and Certificate for Payment; (4) certify the amount the Construction Manager determines is due all Contractors; and (5) forward the Summary of Contractors' Applications for Payment and Project Application and Certificate for Payment to the Architect.
- § 9.4.2.1 Within seven (7) days after the Architect receives the Project Application and Project Certificate for Payment and the Summary of Contractors' Applications for Payment from the Construction Manager, the Architect will either

- (1) issue to the Owner a Project Certificate for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Project Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Project Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward the Architect's notice of withholding certification to the Contractors.
- § 9.4.3 The Construction Manager's certification of an Application for Payment shall be based upon the Construction Manager's evaluation of the Work and the information provided as part of the Application for Payment. The Construction Manager's certification will constitute a representation that, to the best of the Construction Manager's knowledge, information and belief, the Work has progressed to the point indicated and the quality of the Work is in accordance with the Contract Documents. The certification will also constitute a recommendation to the Architect and Owner that the Contractor be paid the amount certified.
- § 9.4.4 The Architect's issuance of a Certificate for Payment shall be based upon the Architect's evaluation of the Work, the recommendation of the Construction Manager, and information provided as part of the Application for Payment. The Architect's certification will constitute a representation that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated, that the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified.
- § 9.4.5 The representations made pursuant to Sections 9.4.3 and 9.4.4 are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Construction Manager or Architect.
- § 9.4.6 The issuance of a separate Certificate for Payment or a Project Certificate for Payment will not be a representation that the Construction Manager or Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed the Contractor's construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

- § 9.5.1 The Construction Manager or Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Construction Manager's or Architect's opinion the representations to the Owner required by Section 9.4.4 and 9.4.5 cannot be made. If the Construction Manager or Architect is unable to certify payment in the amount of the Application, the Construction Manager will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor, Construction Manager and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Construction Manager or Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence or subsequent observations, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Construction Manager's or Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from the acts and omissions described in Section 3.3.2 because of
 - defective Work not remedied; .1
 - .2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
 - .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
 - .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
 - .5 damage to the Owner, another Prime Contractor or a Separate Contractor;
 - .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
 - .7 failure to carry out the Work in accordance with the Contract Documents;
 - .8 receipt by the Owner of a notice of withholding from the New York State Department of Labor or other administrative agencies having jurisdiction over the Project;

- failure to comply with applicable federal, state or local statutes, regulations, and/or laws, including, without limitation, laws and regulations applicable to the provision of certified payrolls;
- .10 failure of the Contractor to provide executed performance and payment bonds and a current certificate of insurance and endorsements;
- .11 reasonable evidence that the Work has not progressed as indicated on the Application for Payment;
- damages caused to the Owner, Construction Manager, the Architect or another Contractor as a result the Contractor's performance of its Work;
- the Architect's and/or the Construction Manager's discovery or observation of work which has been previously paid for by the Owner which is defective and/or incomplete;
- .14 The amount requested exceeds the percent completion of Work on the site; or
- .15 breach of this Agreement.

Notwithstanding the extent to which the Construction Manager and/or Architect certify an Application for Payment, the Owner shall have the right to withhold payment, in whole or in part, should the Owner determine that any of the grounds for withholding certification set forth in this Section 9.5.1 do in fact exist. If the Owner withholds payment, in whole or in part, the Owner shall promptly provide to the Contractor, Architect and Construction Manager a written explanation of the reason(s) for which payment is withheld and shall promptly pay, in accordance with the Contract Documents, all amounts which are not in dispute.

- § 9.5.2 If the Contractor disputes any determination by the Owner, Construction Manager or Architect with regard to any Certificate for Payment or in the event of a bona fide dispute between the Contractor and Owner, the Contractor nevertheless shall expeditiously continue to prosecute the Work and may submit a Claim in accordance with Article
- § 9.5.3 When the above reasons for withholding certification or the Owner's withholding of payment are removed, certification will be made for amounts previously withheld.
- § 9.5.4 If the Architect or Construction Manager withholds certification for payment under Section 9.5.1, or if the Owner otherwise deems it necessary to protect its interests or the interests of the Project, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Construction Manager and both will reflect such payment on the next Certificate for Payment.
- § 9.5.5 Notwithstanding anything above to the contrary, the Owner has the right to withhold payment to the Contractor to protect itself against damages incurred or which may be incurred as a result of the Contractor's breach or negligence, including, but not limited to, the items set forth in Section 9.5.1. With respect to any liens, claims, or other circumstances for which the Owner is entitled to withhold payments pursuant to decisions by the Architect pursuant to Section 9.5.1, the Owner shall be entitled to withhold a sum equal to twice the stated amounts of such liens or claims, or, where there is no stated amount, twice the amount determined by the Architect to be necessary to protect the interests of the Owner. The Owner will release payments withheld due to liens provided that the Contractor obtains a discharge of record of such lien, by bonding or otherwise. By posting a lien discharge bond, however, the Contractor shall not be relieved of any responsibilities or obligations under the Agreement, including, without limitation, the duty to defend, indemnify, and hold harmless the Indemnitees (as defined previously in Section 3.18). The cost of any premiums or other expenses incurred in connection with such bonds or other means of discharge of record shall be the sole responsibility of the Contractor and shall not be part of, or cause any adjustment to, the Contract Sum.
- § 9.5.6 If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to the Contract, including but not limited to these General Conditions, such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained herein to the contrary, if the Contractor fails to promptly make any payment due the Owner, or the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective work, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner's sole discretion, elect either to: (1) deduct an amount equal to that which the Owner is entitled from any payment then or thereafter due the Contractor from the Owner, or (2) issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

§ 9.6 Progress Payments

- § 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents unless such requisition is not in accordance with the terms of the Contract Documents, and shall so notify the Construction Manager and Architect.
- § 9.6.2 Payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held in trust by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contracts with the Contractor for which payment was made by the Owner. The Contractor shall strictly comply with any common law, statutory, or decisional law trust fund requirements in the State of New York (including, without limitation, the requirements of New York Lien Law Article 3-A), and hereby agrees that the Owner has the same rights as any beneficiary of such trusts to examine the books and records of the Contractor to determine such compliance, from time to time at the Owner's sole discretion. The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in similar manner.
- § 9.6.2.1 Within seven (7) days of receipt of a payment from the Owner, the Contractor shall pay each of its Subcontractors and suppliers for work performed and materials furnished by them as reflected in the payment from the Owner, less an amount necessary to satisfy any outstanding claims, liens, or judgments and less a retained amount of not more than 5%, except that the Contractor may retain not more than 10% provided that prior to entering into a Subcontract with the Contractor, the Subcontractor is unable or unwilling to provide a performance bond and labor and material payment bond both in the full amount of the subcontract at the request of the Contractor. The Contractor shall not retain portions of the proceeds owed any Subcontractor or supplier from the Owner's payment to the Contractor for the "contract balance." Similar provisions apply to the Subcontractor and/or supplier paying each of its Subcontractors and suppliers. Nothing in this Section shall create in the Owner any obligation to pay, or to ensure that the Contractor pays, any Subcontractor or supplier, or any relationship in contract or otherwise, implied or expressed, between any Subcontractor or supplier and the Owner. The Contractor agrees that it shall comply with the payment requirements of Section 106-b(2) of the New York General Municipal Law, as amended, and that to the extent there is any conflict between that statutory section and the provisions of this Section 9.6.2.1, the provisions of the statute shall prevail.
- § 9.6.3 The Construction Manager will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Owner, Construction Manager and Architect on account of portions of the Work done by such Subcontractor.
- § 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven (7) days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Construction Manager nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.
- § 9.6.5 The Contractor's payments to its suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.
- § 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.
- § 9.6.7 Payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

(Paragraph deleted)

§ 9.7 Failure of Payment

§ 9.7.1 If, through no fault of the Contractor, the Construction Manager and Architect do not issue a Certificate for Payment within 20 days of the Construction Manager's receipt of the Contractor's Application for Payment or if, through no fault of the Contractor, the Owner does not pay the Contractor the amount certified by the Construction Manager and Architect, subject to the Owner's right to withhold payment under the terms of the Contract Documents, within 30 days of the date established for such payment in the Contract Documents, then the Contractor may, upon seven (7) additional days' written notice and opportunity to cure to the Owner, Construction Manager and Architect, stop the Work until payment of the amount owing has been received. To the extent it is determined that payment to the Contractor was improperly held through no fault of the Contractor and the Contractor elected to stop its Work consistent with the procedure set forth in this Section, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up as provided for in the Contract Documents. However, if the Contractor stops its Work and it is determined that the Owner had the right to withhold payment under the terms of the Contract Documents, then the Contractor shall be responsible to the Owner for all costs and damages (including attorneys' fees) arising from such stoppage of Work and the Contractor shall not be entitled to any adjustment in the Contract Sum or the Contract Time. This Section shall not apply: (a) to the extent that the Contractor owes to the Owner any amount pursuant to the provisions of this Contract, or (b) to the extent the Owner is required to expend amounts to purchase additional insurance on behalf of the Contractor to meet the insurance requirements of this Agreement.

§ 9.7.2 If the Owner is entitled to payment from the Contractor under or pursuant to the Contract Documents, such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or the Owner incurs any costs or expenses to cure any default of the Contractor or to correct defective work, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner's sole discretion, elect either to (1) deduct an amount equal to that which the Owner is entitled from any payment then or thereafter due the Contractor from the Owner, or (2) issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

§ 9.8 Substantial Completion

§ 9.8.1 The date of Substantial Completion of the Project or a designated portion thereof is the date when construction is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the entire Project (or such portion thereof as Owner earlier elects to occupy or utilize) for the use for which it is intended. Minor items of completion or correction ("Punch List Work") may be performed after Substantial Completion, provided that such items can and shall be performed at such times and in such manner that such Work does not unreasonably interfere with the Owner's occupancy and use of the Project. Substantial Completion shall not be deemed to exist until (a) the Owner receives a Certificate of Occupancy for the Project (or such portion as elected by Owner) if such Certificate of Occupancy is required, and any other permits, approvals, licenses and any other documents from governmental authorities having jurisdiction therefore necessary for the beneficial occupancy of the Project and (b) the Contractor, Construction Manager, Architect and Owner have agreed upon a schedule for final completion and to provide the Owner with all as-built drawings, operating manuals, warranties and other required closeout documents. Warranties called for by the Agreement or by the Drawings and Specifications shall commence on the date of Substantial Completion of the Project or designated portion thereof, or any later date that the parties agree. This date shall be established by a Certificate of Substantial Completion signed by the Owner, Contractor, Architect and Construction Manager.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall notify the Construction Manager, and the Contractor and Construction Manager shall jointly prepare and submit to the Architect a comprehensive list which shall identify all non-conforming, defective and incomplete Work and establish the date of commencement of warranties in connection with any such Work. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the list, the Architect, assisted by the Construction Manager, will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the list, which is not sufficiently complete in accordance with the requirements of the Contract Documents so that the Owner can occupy or utilize the Work or designated portion

thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Construction Manager or Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect, assisted by the Construction Manager, to determine Substantial Completion. If the Architect and the Construction Manager are required to perform additional substantial completion inspections because the Work fails to be substantially complete, the amount of compensation paid to the Architect and the Construction Manager by the Owner for additional services shall be deducted from the final payment to the Contractor.

- § 9.8.4 When the Architect, assisted by the Construction Manager, determines that the Work or designated portion thereof is substantially complete, the Construction Manager will prepare, and the Construction Manager and Architect shall execute a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all Punch List Work, which timeframe shall not exceed 30 days. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.
- § 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.
- § 9.8.5.1 In conformance with New York General Municipal Law Section 106-b(1)(a), upon proper execution of Certificate of Substantial Completion of Work, the Contractor shall submit a requisition for payment of the remaining amount of the Contract Sum. Upon certification of payment by the Architect, the Owner will approve and promptly pay the remaining amount of the Contract Sum less two times value of any remaining items to be completed or corrected and less an amount necessary to satisfy any claims, liens or judgments against Contractor which have not been suitably discharged. Such payment shall be made under terms and conditions governing final payment except that the Owner's making of such payment shall not constitute the Owner's waiver of any objection to all or any portion of the Work performed by the Contractor or any claims the Owner may then have against the Contractor.
- § 9.8.5.2 Neither the requisition for payment stipulated in Section 9.8.5.1 nor any portion of retained percentage shall become due until the Contractor submits to the Construction Manager:
 - an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the work for which the Owner or the Owner's property might in any way be responsible, have been paid or otherwise satisfied, the form of which will be the currently authorized AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims";
 - .2 consent of all sureties, if any, to such payment, the form of which will be the currently authorized AIA Document G707A, "Consent of Surety to Reduction in or Partial Release of Retainage," but which will not be required if the amount withheld under Section 9.8.3.1 exceeds the amount of retainage;
 - if required by the Owner, other data establishing payment or satisfaction of all such obligations, such as receipts, releases, and waivers of liens arising out of contract to such extent and in such form as may be designated by the Owner; and
 - .4 all required closeout documents.
- § 9.8.5.3 As the Punch List Work is satisfactorily completed or corrected, the Contractor may submit a requisition for payment of these items. The Contractor shall submit with each such requisition for payment affidavits, consents of surety, and other data as described in Section 9.8.5.2 covering work for which payment is requested. Upon certification of such requisitions by the Architect and Construction Manager, the Owner will approve and promptly pay the requisition less an amount two times that which is necessary to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged.
- § 9.8.5.4 Where the Project includes heating, air conditioning, electrical, communication, data or other systems which are not put into operation at the time of occupancy, a sum shall be withheld until these systems have operated to the general satisfaction of the Architect. The Contractor shall provide complete start up and commissioning of the systems with a detailed check list as recommended by the equipment or system manufacturer. The retained amount shall approximate five percent (5%) of the cost of the systems as determined by the cost breakdown submitted. The

guaranty/warranty period for such systems will not commence until after such Architect approval.

- § 9.8.5.5 The Contractor shall complete the Punch List Work for the Project no later than 30 days after Substantial Completion of the Project. The Contractor shall be fully liable to the Owner for all damages suffered by the Owner as a result of delay in achieving final completion of the Work, including without limitation, additional architectural and construction management fees related to extended services.
- § 9.8.6 If the Architect or the Construction Manager is required to inspect the Work more than two (2) times prior to certifying the Work as being substantially complete on account of the discovery of one or more items that are not sufficiently complete, the Contractor shall be liable to the Owner for the amount of any costs, additional fees or compensation due from or paid by the Owner to the Architect and/or the Construction Manager for the additional inspections.

§ 9.9 Partial Occupancy or Use

- § 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor and Construction Manager shall jointly prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect after consultation with the Construction Manager.
- § 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Construction Manager, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.
- § 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.
- § 9.9.4 The Contractor shall cooperate with the Owner in order to make portions of the Project available as soon as possible.
- § 9.9.4.1 The Project site and buildings, whether work of the Contractor is partially or fully completed or not, are property of the Owner who shall have certain rights and privileges in connection with use of same.
- § 9.9.4.2 Should there be, in the opinion of the Architect or Construction Manager, unwarranted delay on part of any Contractor in completion of incomplete or defective work or other Contract requirements, and the Architect so certifies, the Owner may have full or partial use and occupancy of any or all portions of buildings as required for moving in or installing furniture, fixtures, supplies, or equipment and for general cleaning and maintenance work. In such event, the Contractor whose unfinished work is done subsequent to installation of furniture, fixtures, equipment, etc., shall be responsible for the prevention of any damage to such installation. Such use or occupancy by the Owner shall in no instance constitute acceptance of any of the Work.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon completion of the Work, the Contractor shall forward to the Construction Manager a written notice that the Work is ready for final inspection and acceptance and shall also forward to the Construction Manager a final Contractor's Application for Payment. Upon receipt, the Construction Manager will evaluate the completion of Work of the Contractor and then forward the notice and Application, with the Construction Manager's recommendations, to the Architect who will promptly make such inspection. When the Architect, finds the Work acceptable under the Contract Documents and the Contract fully performed, the Construction Manager and Architect will promptly issue a final Certificate for Payment or Project Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due

and payable. The Construction Manager's and Architect's final Certificate for Payment or Project Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

- § 9.10.1.1 If the Work is not accepted by the Owner after final inspection and additional time is required to complete items identified during the final inspection, the date starting the two-year correction period described in Article 12.2 shall be set by the Architect at his discretion, but not later than the date of the final Certificate for Payment.
- **§9.10.1.2** If the Architect and the Construction Manager are required to provide additional services, extend the duration of services to the Owner, and/or perform additional final inspections because the Work fails to comply with the requirements of the Contract Documents, or the Contractor did not complete the Work in accordance with the construction schedule or Project schedule, the amount of compensation paid to the Architect and the Construction Manager by the Owner for additional services shall be deducted from the final payment due to the Contractor.
- § 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect through the Construction Manager (1) all closeout documents required by the Contract Documents, including, without limitation, as-built drawings, attic stock, maintenance manual, operating instructions and other documents required to be delivered under the Contract in connection with the Work in the form required by the Owner, (2) confirmation that all start-up, testing, balancing and commissioning of systems, equipment and other materials has been successfully completed as required by the Contract Documents, (3) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (4) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (5) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (6) consent of surety, if any, to final payment, (7), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner, and (8) all warranties and guarantees required by the Contract Documents. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.
- § 9.10.2.1 In addition to the submittals required in Section 9.10.2 above, the Contractor shall submit separate final release or waivers of lien for each Subcontractor, material supplier, or others with lien rights against the Project, and shall submit a list of such parties.
- § 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Construction Manager and Architect so confirm, the Owner shall, upon application by the Contractor and certification by the Construction Manager and Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect through the Construction Manager prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment

(Paragraphs deleted)

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by the Owner shall not constitute a waiver of claims, causes of action, damages or complaints by the Owner.

- § 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing in accordance with Article 15 and identified by that payee in writing as unsettled at the time of the final Application for Payment.
- § 9.10.6 At any time a lien is filed against the Project funds, the Owner may demand that the Contractor discharge said

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lien, through bonding or otherwise, and the Contractor must obtain the discharge of said lien within seven (7) days of such demand at the Contractor's sole cost and expense, and at no cost to the Owner. If any lien or other encumbrance required to be removed at the Contractor's sole cost and expense pursuant to this Section is not discharged of record as aforesaid, the Owner shall have the right to take such action as the Owner shall deem appropriate (which shall include the right to cause such lien or other encumbrance to be canceled and discharged of record), and in such event, all costs and expenses incurred by the Owner in connection therewith (including, without limitation, premiums for any bond furnished in connection therewith, and reasonable attorneys' fees,

court costs and disbursements), shall be paid by the Contractor to the Owner on demand or, at the option of the Owner, deducted from any payment then due or thereafter becoming due from the Owner to the Contractor in accordance with the provisions of these General Conditions.

- § 9.10.7 Existing warranties shall not deprive the Owner of any cause of action, right, or remedy otherwise available for breach of any of the provisions of the Contract Documents. The periods referred to above shall not be construed as limitations on the time in which the Owner may pursue any such action, right or remedy.
- § 9.10.8 The Contractor shall achieve final completion of all Work, including, without limitation, correction of punch-list items, preparation and delivery of all manuals, presentation of training and completion of final paper submissions not later than 30 days following the date of Substantial Completion. In the event the Contractor shall fail to achieve final completion of the Work within such a period of time, the Contractor and the Contractor's surety, if any, shall be liable for and shall reimburse the Owner for any and all fees paid to the Architect and Construction Manager and other expenses made necessary by the Contractor's failure. Additional fees and expenses shall be charged by the Owner against any Final Payment due or which may become due to the Contractor, and the Contractor shall promptly pay or refund the Owner the excess, if any, upon the Owner's written request.

PROTECTION OF PERSONS AND PROPERTY **ARTICLE 10** § 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, implementing, directing, controlling, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall submit the Contractor's safety program to the Construction Manager for review and coordination with the safety programs of other Contractors. The Construction Manager's responsibilities for review and coordination of safety programs shall not extend to direct control over or charge of the acts or omissions of the Contractors, Subcontractors, agents or employees of the Contractors or Subcontractors, or any other persons performing portions of the Work and not directly employed by the Construction Manager. The Contractor's safety precautions and programs shall include specific steps designed to minimize the risk of contracting or spread of COVID-19, including provision of all appropriate personal protective equipment, social distancing, avoiding stacking of trades, and other reasonable precautions.

- § 10.1.1 Prior to beginning any Work, the Contractor shall submit a copy of its corporate safety plan to the Owner and the Construction Manager. Two (2) weeks after receipt of the Notice to Proceed, the Contractor shall provide a site safety logistics plan to the Construction Manager. The site safety logistics plan should minimally include locations of the temporary fence and gates, traffic plans for deliveries and removals, refuse container locations, crane locations, pick locations, boom radium, and lift locations, stockpiles, toilet locations, site water and power locations, and safety. This plan shall also show the location of all staging and storage areas, clearly separating construction and school areas. The logistical information represented by the construction documents shall serve as a minimal guide. The Contractor is required to submit its corporate safety policy within ten (10) days of receipt of the Notice to Proceed. Said policy must minimally meet OSHA standards and define details concerning the maintenance of a safe work environment. The Contractor shall make the participation of its Subcontractors in its safety program mandatory. A list of key personnel, with addresses and telephone numbers for emergency purposes shall be forwarded to the Construction Manager and Architect. The Owner and the Construction Manager shall establish a fire coordination procedure and shall forward same to the Contractor for its use during the performance of its Work.
- § 10.1.2 The Contractor shall provide its own COVID-19 Safety Plan to the Owner prior to the start of any work. The Contractor shall designate a person on its staff to be responsible for monitoring the wearing of PPE by each person on site working with or for the Contractor. The Contractor shall strictly follow and ensure that its subcontractors follow the Contractor's COVID-19 Safety Plan as well as all applicable Center for Disease Control guidelines and federal, state and local orders and directives.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take necessary precautions for safety of, and shall provide reasonable protection to prevent damage, injury, infection or exposure to COVID-19, or loss to

- employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor;
- .3 the Owner's real and personal property and other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction;
- .4 construction or operations by the Owner, Separate Contractors, or other Contractors; and
- .5 the existing buildings and premises in the vicinity of or affected by the Contractor's operations.
- § 10.2.1.6 Safe access to and egress from any building under construction as part of this Contract, or any existing building in which Work is being done under this Contract, shall be maintained and remain unencumbered by the Contractor in accordance with all applicable codes, rules and regulations of authorities having jurisdiction on the Work. The Contractor and its Subcontractors shall cooperate in maintaining this condition. Roadways, paths, walks, exits, service drives and other areas shall remain unobstructed and shall be maintained in a safe and satisfactory condition, for all persons using the building and premises. Materials shall not be stored promiscuously about the site or in the building, but shall be carefully stored in areas which will not interfere with pedestrian traffic or with access to and egress from adjacent properties and use of the building. The Contractor shall provide and maintain such temporary Work as may be required for the protection of its finished Work where liable to injury. The Contractor will be responsible for all of its Work, materials and equipment that may be damaged or stolen during the duration of the Contract and until the Work is accepted by the Owner. The Contractor shall make good any such damage or loss without expense to the Owner. The Contractor shall not permit unnecessary hazards to be created nor permit them to continue if they are discovered. The Contractor's storage and staging areas shall be only in locations assigned or approved by the Owner and Architect and may be required to be relocated by the Contractor as building occupancy or use changes during the course of the Work. This relocation will be done by the Contractor at no additional cost to the Owner.
- § 10.2.2 The Contractor shall comply with, and give notices required by, applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.
- § 10.2.2.1 The Contractor acknowledges that the Labor Law of the State of New York, and regulations adopted thereunder, place upon both the Owner and the Contractor certain duties and that liability for failure to comply therewith is imposed on both the Owner and the Contractor regardless of their respective fault. The Contractor hereby agrees that, as between the Owner and the Contractor, the Contractor is solely responsible for compliance with all such laws and regulations imposed for the protection of persons performing the Contract. The Contractor shall indemnify and hold harmless the Owner of and from any and all liability for violation of such laws and regulations and shall defend any claims or actions which may be brought against the Owner as the result thereof. In the event that the Contractor shall fail or refuse to defend any such action, the Contractor shall be liable to the Owner for all costs of the Owner in defending such claim or action and all costs of the Owner, including attorney's fee, in recovering such defense costs from the Contractor.
- § 10.2.2.2 All laborers, workers, and mechanics employed in the performance of the Work of this Project shall be certified as having successfully completed a course in construction safety and health approved by the United States Department of Labor's Occupational Safety and Health Administration that is at least 10 hours in duration. The Contractor and its Subcontractors shall conduct their operation in accordance with the Safety Guides for Construction as issued by State Education Department, and the Contractor's safety program.
- § 10.2.2.3 All safety equipment including hard hats, weather protective gear and PPE required for the Contractor to perform its Work are to be supplied by the Contractor or its Subcontractors. Within the designated construction areas, the Contractor's employees, superintendents, or other agents, and its Subcontractors, employees, superintendents, or other agents are required to wear hard hats and other required or essential safety equipment. Each person seen without a hard hat, or otherwise failing to comply with this requirement, will be ordered to leave the Project. No prior warnings will be given by the Owner, Construction Manager or Architect. The Contractor and its Subcontractors shall be solely responsible for making up and paying for any loss of production or required progress resulting from the removal of

personnel from the Project as set forth herein including any costs incurred by the Owner in connection with the work of other contractors.

- § 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.
- § 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.
- § 10.2.5 The Contractor shall promptly remedy damage and loss to property referred to in Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4, except damage or loss attributable to acts or omissions of the Owner, Construction Manager or Architect or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18, and shall not be limited by such damage or loss being insured under property insurance required by the Contract Documents.
- § 10.2.6 The Contractor shall schedule weekly safety meetings and each of its Subcontractors must be properly represented at such meetings. The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner, Construction Manager and Architect.
- § 10.2.7 The Contractor shall not load or permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition. The Contractor shall not load any part of the Work with materials, equipment, shores, bracing, or other items which in any way could cause damage to the Work or to other Work or could endanger persons in or about the Work.
- § 10.2.8 If, during the construction, public or private property is damaged or destroyed as a consequence of its Work, the Contractor shall, at its own expense, restore such property to a condition equal to that existing before such damage or injury was done, by repairing, rebuilding or replacing it, or otherwise making good such damage or destruction in an acceptable manner.
- § 10.2.9 The Contractor shall be responsible for all breakage of glass, which has been furnished and installed as part of Contract and existing glass that is broken due to operations under the Contract for Work. No matter by whom or what cause glass was broken, the Contractor shall replace all broken glass before completion and acceptance of the Contractor's Work. The Contractor may claim damages, if applicable.
- § 10.2.10 In addition to all requirements set forth herein, the Contractor and its Subcontractors shall fully comply with the provisions of the federal Occupational Safety and Health Act of 1970, as amended, and with any rules and regulations pursuant to the Act. This requirement shall apply continuously and not be limited to normal working hours.
- § 10.2.11 The Contractor shall also be responsible, at the Contractor's sole cost and expense, for all measures necessary to protect any property adjacent to the Project and improvements therein. Any damage to such property or improvements shall be promptly repaired by the Contractor at its sole expense.
- § 10.2.12 The Contractor shall immediately contact the Construction Manager and, within 24 hours, report, in writing, to the Owner, Architect and Construction Manager, all accidents arising out of or in connection with the Work which cause death, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious property damages are caused, the accident shall be reported immediately by telephone or messenger to the Owner, Construction Manager, and Architect.
- § 10.2.13 The Contractor shall be solely responsible for any conditions that develop during construction and in the event any structure is dislocated, over strained, or damaged so as to affect is usefulness, the Contractor shall be solely

responsible. The Contractor shall take whatever steps necessary to strengthen, relocate or rebuild the structure to meet requirements at the sole expense of the Contractor.

- § 10.2.14 The Contractor is responsible for restoration or repair of utilities, private property, buildings, pavement, walkways, roads, etc. damaged by its activities under this Agreement to the satisfaction of the Owner, Construction Manager and Architect.
- § 10.2.15 From the commencement to the final completion of the Work, the Contractor shall keep the Work and the Owner's building(s) free from accumulation of water no matter the source or cause of water infiltration.
- § 10.2.16 During construction, the Contractor shall be responsible for maintaining a watertight structure. This responsibility shall include additions/alterations of existing buildings. The Contractor shall be responsible for temporary roofing, tarps and other protection at roofs, cavity walls, etc. Should the Contractor fail to provide adequate protection causing flooding, damage or other disturbance to the existing building(s), the Contractor shall be responsible for all costs associated with clean up, remediation and repairs. Inasmuch as flooding and water damage have safety implications to the general public, clean up, remediation and repairs may be made by the Owner without prior notice to the Contractor. Administration costs incurred by the Owner, Construction Manager and Architect will also be back charged to the Contractor. The Contractor, by entering into this Contract, agrees to be liable for these costs.

§ 10.2.17 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials

- § 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents and all applicable laws, rules and regulations regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to, asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner, Construction Manager and Architect in writing. The Owner shall arrange for the material to be tested and if the test reveals that the material is a hazardous material or substance which has not been rendered harmless, the Owner shall pay for the test; otherwise, the Contractor shall bear the cost of the test and the Contract Sum shall be reduced by the amount of that cost. The Contractor shall comply with the reasonable instructions of the Owner after the test is conducted. This Section shall not apply in the case of asbestos which is to be removed and disposed of as part of the Work of the Contract.
- § 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify a presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.
- § 10.3.3 To the fullest extent permitted by law, but only to the extent of available insurance proceeds, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Construction Manager, Architect, their consultants, and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that the person seeking indemnification: (1) did not bring such material onto the Project site; (2) timely provided notice of the condition and stopped Work in the affected area as required by Section 10.3.1; and (3) has a claim, damage, loss or expense that is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself). The Owner shall have no indemnity obligation to the

extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity or the fault or negligence of a third party for whom the Owner is not responsible.

- § 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.
- § 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.
- § 10.3.6 If, without negligence or fault on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance (that was not brought to the site by the Contractor or those for whom the Contractor is responsible) solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.
- § 10.3.7 The Contractor shall notify the Owner of any storage, use, or discovery of hazardous material on the Project site which the Contractor knows or reasonably should know could cause bodily injury or death and of any injury or death attributable to any such hazardous material.
- § 10.3.8 The Contractor shall take all reasonable precautions and measures to prevent any contamination by or spread or disturbance of hazardous or potentially hazardous substances or materials stored, used, or discovered on the Project site.
- § 10.3.9 For the avoidance of any doubt, COVID-19 shall not be considered a Hazardous Material for purposes of this Article 10.3.

§ 10.4 Emergencies

- § 10.4.1 The Contractor shall provide at the site, such equipment and medical facilities as are necessary to supply first-aid service to anyone at the Work.
- § 10.4.2 The Contractor must promptly report in writing to the Construction Manager all emergencies whatsoever arising out of, or in connection with the performance of the Work, whether on, or adjacent to the site, which caused death, personal injury or property damages, giving full details and statements of witnesses. In addition, if death, injury, or damages are caused, the emergency shall be reported immediately to the Construction Manager, Owner, and Architect.
- § 10.4.3 In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.
- § 10.4.4 All fire and emergency access, including roads, rights-of-way, corridors, doors, and stairs, and all existing fire and smoke detection systems shall be maintained at all times in accordance with fire safety laws. If the Work requires the temporary obstruction of any fire and emergency access or existing fire and smoke detection systems, the Construction Manager shall be notified at least 72 hours in advance.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

- § 11.1.1 The Contractor agrees to secure and maintain, at the Contractor's own expense, all insurance coverage required in this Article 11 and elsewhere in the Contract Documents from one or more insurance companies licensed and admitted to write such insurance in New York State. Insurers must carry an A.M. Best A- rating or higher. The decision to accept non-licensed and non-admitted carriers lies exclusively with the Owner. The Contractor's insurance must include the following, without limitation, and must be written with limits no less than specified in Section 11.1.2:
 - .1 claims under workers' compensation, disability benefit, and other similar employee benefit acts applicable to the Work to be performed, including, without limitation, claims by the employees of private entities

- performing Work at the site that are exempt from workers' compensation insurance coverage requirements on account of number of employees or occupation, which entities must maintain voluntary compensation coverage at the same limits specified for mandatory coverage for the duration of the Project;
- .2 claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- .3 claims for damages because of bodily injury, sickness, disease, or death of any person other than the Contractor's employees;
- .4 claims for damages insured by usual personal injury liability coverage sustained (1) by a person as a result of an offense directly or indirectly related to employment of such person by the Contractor, or (2) by another person;
- .5 claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including resulting loss of use resulting;
- .6 claims for damages because of bodily injury, death of a person, or property damage arising out of ownership, maintenance, or use of a motor vehicle; and
- .7 claims involving contractual liability applicable to the Contractor's obligations under Section 3.18.
- .8 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.
- § 11.1.2 Coverages, whether written on an occurrence or claims-made basis, must be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment. Claims-made coverage will only be allowed when the Contractor demonstrates that occurrence-based coverage is not available for a specific type of required coverage. The Contractor acknowledges that failure to obtain such insurance on behalf of the Owner constitutes a material breach of contract and subjects it to liability for damages, indemnification and all other legal remedies available to the Owner. The Contract shall indemnify the Owner for any applicable deductibles. The insurance required by Section 11.1.1 must be written for not less than the following limits, or greater limits as may be required by law, and include the following terms:
 - 11 Commercial General Liability. Occurrence-based Commercial General Liability coverage to include bodily injury, personal injury, and property damage applicable to ongoing operations, products & completed operations, and contractual liability, all with a per-project aggregate endorsement. No XCU exclusion is allowed for explosion, collapse, and underground operations. There will be no coverage restrictions and/or exclusions involving New York State Labor Law statutes or gravity related injuries. Products and Completed Operations coverage must be maintained in force for a minimum of three (3) years following Final Completion of the Project. Minimum limits are:

\$1,000,000 per Occurrence/\$2,000,000 Aggregate

\$2,000,000 Products and Completed Operations

\$1,000,000 Personal and Advertising Injury

\$100,000 Fire Damage

\$10,000 Medical Expense

The general aggregate shall apply on a per-project basis.

The commercial general liability policy shall be endorsed to waive the right of subrogation against the Owner and its Cooperative Board, employees and volunteers.

- **Automobile Liability.** Bodily Injury and Property Damage coverage for the Contractor as the owner or lessee of automobiles, trucks, trailers, self-propelled Contractor's equipment, and all other owned and non-owned vehicles registered for use on the public highway and/or used in operations relating to the Contractor's Work, with a minimum Combined Single Limit of \$1,000,000. If any such vehicles are to be used to transport hazardous materials, the Contractor shall also provide pollution liability broadened coverage evidenced by ISO Form CA 99 48. The automobile liability policy shall be endorsed to waive the right of subrogation against the Owner and its Cooperative Board, employees and volunteers.
- .3 Excess Liability and/or Umbrella Liability. Minimum limits are:
 - .1 \$5 million each Occurrence and Aggregate for general construction and no work at elevation (1 story 10 feet) or project values less than or equal to \$1,000,000;
 - 2 \$10 million each Occurrence and Aggregate for high-risk construction, work at elevation (>1 story or 10 feet) or project values greater than \$1,000,000.

- Umbrella/Excess coverage shall be on a follow-form basis over the Auto Liability and General Liability coverages. The Umbrella/Excess liability policy shall be endorsed to waive the right of subrogation against the Owner and its Cooperative Board, employees and volunteers.
- .4 Workers' Compensation. Statutory Workers' Compensation (C-105.2 or U-26.3); and NYS Disability Insurance (DB-120.1) for all employees. Proof of coverage must be on the approved specific form, as required by the New York State Workers' Compensation Board. ACORD certificates are not acceptable. A person seeking an exemption must file a CE-200 Form with the state. The form can be completed and submitted directly to the WC Board online. The workers' compensation and employers' liability policies shall be endorsed to waive the right of subrogation against the Owner and its Cooperative Board, employees and volunteers.
- .5 Employer's Liability/Disability
 - .1 Disability Benefits Requirements. To comply with the New York State Disability Benefits Law, the Contractor must (1) be legally exempt from ing disability benefits insurance coverage, (2) obtain such coverage from insurance carriers, or (3) be self-insured.
 - 2 Disability Benefits Coverage Evidence. To demonstrate compliance with the New York State Disability Benefits Law, the Contractor must provide one of the following forms to the Owner:
 - .1 Either CE-200, "Affidavit For New York Entities And Any Out Of State Entities With No Employees, That New York State Workers' Compensation And/Or Disability Benefits Insurance Coverage Is Not Required" or CE-200, "Affidavit That An Out-Of-State Or Foreign Employer Working In New York State Does Not Require Specific New York State Workers' Compensation And/Or Disability Benefits Insurance Coverage" (either affidavit must be stamped as received by the New York State Workers' Compensation Board); or
 - **.2 Either** DB-120.1, "Certificate of Disability Benefits," or DB-820/829, "Certificate/Cancellation of Insurance" (the Contractor's insurance carrier must send either form to the Owner); or
 - .3 DB-155 (3/04), "Certificate of Disability Benefits Self-Insurance."

The employers' liability policies shall be endorsed to waive the right of subrogation against the Owner and its Cooperative Board, employees and volunteers.

- .6 Hazardous Materials. \$2,000,000 per occurrence/\$2,000,000 aggregate, including products and completed operations. Such insurance shall include coverage for the Contractor's operations including, but not limited to, removal, replacement, enclosure, encapsulation and/or disposal of asbestos, or any other hazardous material, along with any related pollution events, including coverage for third-party liability claims for bodily injury, property damage and clean-up costs. If a retroactive date is used, it shall pre-date the inception of the Contract.
 - If the Contractor is using motor vehicles for transporting hazardous materials, the Contractor shall maintain pollution liability broadened coverage (ISO Endorsement CA 9948), as well as proof of MCS 90. Coverage shall fulfill all requirements of these specifications and shall extend for a period of three (3) years following acceptance by the Owner of the Certificate of Completion. The pollution legal liability policy shall be endorsed to waive the right of subrogation against the Owner and its Cooperative Board, employees and volunteers.
- .7 Owner's Protective Liability Policy. For projects less than or equal to \$1,000,000 and work on 1 story (10 feet) only; \$1 million per occurrence, \$2 million aggregate with the Owner (OUBOCES) as the Named Insured. For projects greater than \$1,000,000 and/or work over 1 story (10 feet); \$2 million per occurrence, \$4 million aggregate with the Owner as the Named Insured. The XCU exclusion must be deleted. There will be no additional insureds on any OCP policies.
- § 11.1.3 Certificates of insurance acceptable to the Owner, together with copies of all insurance policies procured by the Contractor pursuant to this Article 11, including, without limitation, terms, conditions, declarations, riders, and endorsements, must be submitted to the Construction Manager for transmittal to the Owner, with copies to the Architect, prior to commencement of the Work. The certificate of insurance must describe the specific services provided by the contractor (e.g., roofing, carpentry, plumbing) that are covered by the liability policies. If any of the foregoing insurance coverages are required to remain in force after final payment, an additional certificate evidencing continuation of such coverage must be submitted with the final Application for Payment as required by Section 9.10.2.2. Information concerning reduction of coverage must be furnished by the Contractor with reasonable promptness. In addition to the Certificates of Insurance and accompanying documents, the Contractor shall provide to the Certificate Holders, on a timely basis, copies of any subsequently issued endorsements that amend any coverages or limits. In addition:

Kathy Hochul, Governor	
	MENT

Roberta Reardon, Commissioner

Orange Ulster BOCES

Teresa Jarrard 285 Main Street Mount Kisco NY 10549 Schedule Year Date Requested PRC# 2023 through 2024 10/17/2023 2023012400

Location E. Axelrod Special Ed Center

Project ID# 2023-1013

Project Type Addition and alterations at the Axelrod Special Education Center

PREVAILING WAGE SCHEDULE FOR ARTICLE 8 PUBLIC WORK PROJECT

Attached is the current schedule(s) of the prevailing wage rates and prevailing hourly supplements for the project referenced above. A unique Prevailing Wage Case Number (PRC#) has been assigned to the schedule(s) for your project.

The schedule is effective from July 2023 through June 2024. All updates, corrections, posted on the 1st business day of each month, and future copies of the annual determination are available on the Department's website www.labor.ny.gov. Updated PDF copies of your schedule can be accessed by entering your assigned PRC# at the proper location on the website.

It is the responsibility of the contracting agency or its agent to annex and make part, the attached schedule, to the specifications for this project, when it is advertised for bids and /or to forward said schedules to the successful bidder(s), immediately upon receipt, in order to insure the proper payment of wages.

Please refer to the "General Provisions of Laws Covering Workers on Public Work Contracts" provided with this schedule, for the specific details relating to other responsibilities of the Department of Jurisdiction.

Upon completion or cancellation of this project, enter the required information and mail **OR** fax this form to the office shown at the bottom of this notice, **OR** fill out the electronic version via the NYSDOL website.

NOTICE OF COMPLETION / CANCELLATION OF PROJECT		
Date Completed:	Date Cancelled:	
Name & Title of Representative:		

Phone: (518) 457-5589 Fax: (518) 485-1870 W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12226

- "Certificate Holders" are the Orange Ulster BOCES, 53 Gibson Road, Goshen, New York 10924.
- Coverages reflected in certificates of insurance and underlying policies must comply with all requirements of this Article 11.
- All insurance documents must be executed with *authorized* signatures. .3
- All required liability policies must be endorsed to provide that any Notice of Cancellation or Notice of Non-Renewal given to the First Named Insured must also be given to the Additional Insureds identified in Section 11.1.4. Such endorsement shall provide that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been provided to the Owner. Copies of such endorsements must be furnished to the Certificate Holders.
- Failure of the Owner to object to the Contractor's failure to furnish a certificate or other evidence of required insurance coverages, or to object to any defect in such certificate or other evidence, or to demand receipt of such certificate or other evidence, is not a waiver of the Contractor's obligation to furnish the required insurance coverages. Furthermore, nothing contained in this Article 11 imposes on the Owner a duty or obligation to review any certificates or other evidence of insurance coverages or to issue any formal approval or acceptance of such evidence, the duty and obligation of the Contractor being to provide insurance meeting the requirements of this Article 11 regardless of any review or lack of review by the Owner of the Contractor's evidence of insurance.
- The Contractor's liability to and indemnification of the Owner is not relieved or diminished by the Contractor securing insurance coverage in accordance with this Article 11. Any acknowledgement of receipt of, or lack of objection by the Owner to, the Contractor's evidence of required insurance coverage is not acceptance in any way of any deficiencies in the Contractor's insurance coverage.

§ 11.1.4 Additional Insureds

§ 11.1.4.1 Notwithstanding any terms, conditions or provisions, in any other writing between the parties, the contractor hereby agrees to effectuate the naming of the Owner, Architect and Construction Manager as Additional Insureds on the Contractor's insurance policies, except for workers' compensation and N.Y. State Disability insurance. The additional insured coverage provided shall not preclude coverage in favor of the Owner, Architect or Construction Manager based on its lack of privity with the Contractor or other third party additional insured. Further, such coverage shall not exclude or deny coverage to the Additional Insureds on the basis that the named insured Contractor's Work or operations are not performed directly for the Owner, Architect, Construction Manager or other third party additional insured.

§ 11.1.4.2 Coverage Evidence. Additional Insured coverage shall be provided by ISO endorsement CG 20 10 11 85 or its equivalent. Examples of equivalent ISO additional insured endorsements include using both CG 20 33 10 01 and CG 20 37 10 01 together. Completed copies of all endorsements must be attached to the certificate of insurance. Certificates of Insurance must clearly state how coverage is effected in the Excess/Umbrella Liability layer. Certificates of Insurance must show the form numbers used to effect all of the Additional Insured coverages. A copy of the actual policy language or endorsement that effects this coverage in each policy must be provided to the Owner and Construction Manager with the Certificate of Insurance. The decision to accept an endorsement rests solely with the Owner.

§ 11.1.4.3 No Reliance on "Following Form." The Contractor acknowledges that "Following Form" wording generally does not meet the primary and non-contributory coverage requirement for Additional Insureds, and that the coverage primacy aspect of Additional Insured coverage is typically addressed in the "Other Insurance" provisions of a policy's "Conditions" section, and often requires an amending endorsement to effect coverage on a primary and non-contributory basis. The Contractor therefore must provide such endorsements to the Owner, or other documentation acceptable to the Owner evidencing that the primary and non-contributory coverage requirements are met as to all policies for which they are required under Section 11.4.1.1.

§ 11.1.5 Normal Expiration/Renewal. When any required insurance is to expire due to a normal expiration or renewal date, the Contractor shall supply the Owner, at least ten (10) days prior to either such date, in addition to Certificates of Insurance, with either (1) copies of all renewed insurance policies, including, without limitation, terms, conditions, declarations, riders, and endorsements evidencing continuation of all coverages in the same manner, limits of protection, and scopes of coverage as was provided by the previous policy, or (2) if acceptable to the Owner, all declaration pages, mandatory riders, and/or endorsements that clearly evidence the continuation of all coverages in the same manner, limits of protection, and scope of coverage as provided by the previous policy.

- § 11.1.6 Subcontractors. The Contractor shall cause each Subcontractor to (1) procure insurance reasonably satisfactory to the Owner and written by companies meeting the same criteria as required under Section 11.1.1, and (2) cause the issuers of those insurance policies to name the Additional Insureds as Additional Insureds under each Subcontractor's comprehensive general, automobile, excess/umbrella, and hazardous materials liability policies. The Additional Insured endorsement included in each such Subcontractor's policies must state that coverage is afforded to all Additional Insureds with respect to any and all claims arising out of operations performed by or on behalf of the Contractor. If the Additional Insureds have other insurance otherwise applicable to a loss, such other insurance will only apply, if at all, on an excess or contingent basis. The amount of each Subcontractor's insurers' liability under each such insurance policy will not be reduced by the existence of such other insurance. In the event the Contractor fails to obtain the required certificates of insurance from the Subcontractor and a claim is made or suffered, the Contractor shall indemnify, defend, and hold harmless the Owner, its Cooperative Board, employees and volunteers 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.
- § 11.1.7 Owner Insurer Loss Payments. In the event the Owner's insurer(s) make(s) any payment toward any loss covered under any policy of insurance the Contractor is required to procure under this Article 11, the Owner's insurer(s) are subrogated to all of the Contractor's rights of recovery against any person or organization including, but not limited to, the Contractor's insurer(s), and the Contractor shall execute and deliver all instruments, papers, and whatever else is necessary to secure those rights. The Contractor shall do nothing after the payment of any damages to prejudice those rights.
- § 11.1.8 Waiver of Subrogation. All insurance policies maintained by the Contractor shall include a waiver of any and all rights of subrogation of the Contractor or its Insurers against the Owner, State of New York, Construction Manager and Architect, along with all other Additional Insureds/Indemnified Parties and their agents, officers, directors and employees for recovery of damages. The Contractor further waives its right of subrogation against the Owner and any Additional Insured or Indemnified Party for any damage or loss to the Contractor's scope work, tools, equipment, materials or any other loss within the scope of any insurance maintained by the Owner.

§ 11.2 Owner's Liability Insurance

The Owner shall purchase and maintain the Owner's usual liability insurance. The Owner may also, at its sole option, purchase and maintain other insurance for protection against claims that may arise from operations under the Contract Documents. The Contractor is not responsible for purchasing and maintaining such optional Owner's liability insurance unless specifically required in the Contract Documents. Neither the Owner's usual liability insurance nor any other insurance obtained by the Owner reduces or otherwise affects the Contractor's insurance requirements under Section 11.1.

(Paragraphs deleted)

§ 11.3 Property Insurance

- § 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the State of New York, property insurance on a replacement cost basis. Such property insurance will 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 is made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance will include interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project.
- § 11.3.1.1 Property insurance will be on a builder's risk, "all-risk," or equivalent policy form and 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 will cover reasonable compensation for the Architect's, Contractor's, and Construction Manager's services and expenses required as a result of such insured loss. Coverage for other perils is not required unless otherwise provided in the Contract Documents. The form of policy for this coverage shall be Completed Value. Notwithstanding the definition of the "Work" in this Contract or in this Section 11.3.1.1, the Contractor assumes all responsibility for the safety and keeping of all tools and equipment and any materials or products used to complete or perform the Work, and which do not form a permanent part of the Work. The Contractor waives all rights against the Owner, Construction Manager and Architect, their consultants, sub-consultants,

employees and agents for any loss or damages to any such tools, equipment or any material or products used to complete or perform the Work, and which do not form a part of the Work. The Contractor shall require similar waivers in favor of the above-named parties from all Subcontractors and Sub-subcontractors, agents and employees of any of them.

- § 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner.
- § 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.
- § 11.3.1.4 The property insurance will cover portions of the Work stored off the site, and also portions of the Work in transit. The insurance required by this Section 11.3 will not, however, cover machinery, tools, equipment, vehicles, shanties, tool houses, trailers, or other temporary or permanent structures owned or rented by the Contractor, a Sub-subcontractor, or their employees, utilized in performance of the Work but not incorporated into the permanent improvements. The Contractor is solely responsible for all such items of its own and any under its control. The Contractor shall, at the Contractor's own expense, provide insurance coverage for all of the items described in this Section 11.3.1.4, which is subject to the provisions of Section 11.3.7.
- § 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 may not commence until the insurance company or companies providing property insurance consent to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance.
- § 11.3.1.6 The Owner shall not be responsible to or for the Contractor or Subcontractor against any loss by fire, lightning, extended coverage, all risk, theft or vandalism and malicious mischief, or any tools, equipment, vehicles, shanties, tool houses, trailers or other temporary or permanent structures wherever located and owned by the Contractor, Subcontractors, their employees or agents.
- § 11.3.1.7 The form of policy for the coverage required by 11.3.1 shall be Completed Value.
- § 11.3.2 Boiler and Machinery Insurance. The Owner, if applicable to the Work and at its sole option, may purchase and maintain boiler and machinery insurance or shall do so if required by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner. This insurance will include interests of the Owner, Construction Manager, Contractor, Subcontractors and Sub-subcontractors in the Work.

§ 11.3.3 Intentionally omitted.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described in this Section 11.3 or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost for it will be charged to the Contractor by appropriate Change Order.

§ 11.3.5 Intentionally omitted.

- § 11.3.6 Upon the Contractor's request, the Owner will provide copies of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project.
- § 11.3.7 Waivers of Subrogation. The Owner and Contractor waive all rights against (1) each other and any of their respective subcontractors, sub-subcontractors, agents and employees, and (2) the Construction Manager, Construction Manager's consultants, Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their respective subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire or other causes of loss to the extent of proceeds under property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as the Owner and Contractor may have to the proceeds

of such insurance held by the Owner. The Owner or Contractor, as appropriate, shall require of the Construction Manager, Construction Manager's consultants, Architect, Architect's consultants, Owner's separate contractors described in Article 6, if any, and any of their respective subcontractors, sub-subcontractors, agents, and employees, by appropriate written agreements, similar waivers each in favor of other parties enumerated in this Section 11.3.7. The policies must provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation is effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity has an insurable interest in the property damaged.

§ 11.3.8 A loss insured under the property insurance will be adjusted by the Owner and made payable to the Owner for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.8.1. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate written agreements shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.8.1 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. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

§ 11.4

(Paragraphs deleted)

Performance Bond and Payment Bond

§ 11.4.1 The Contractor shall furnish performance and labor and material payment bonds, each in an amount equal to one hundred percent (100%) of the Contract Sum, meeting all statutory requirements of the State of New York, in form and substance satisfactory to the Owner in its sole discretion and, without limitation, complying with the following specific requirements:

- The prescribed form of the performance and payment bonds shall conform to AIA A312-2010, and other shall be satisfactory to the Owner in the Owner's sole judgment;
- .2 The cost of the required bonds shall be included in the Contract Sum;
- Bonds shall be executed by a responsible surety licensed in New York State, listed in the latest issue of the U.S. Treasury Circular 570 and having an A.M. Best's rating of no less than A-/IX and shall remain in effect for a period not less than two years following the date of Substantial Completion or the time required to resolve any items of incomplete Work and the payment of any disputed amounts, whichever time period is longer;
- The Contractor shall require the attorney in fact who executes the required bond on behalf of the surety to affix thereof a certified and current copy of his power of attorney indicating the monetary limit of such power. The signatures of the Contractor and Surety shall be acknowledged by a notary public;
- Every bond under this Section 11.4.1 shall name Orange Ulster BOCES as the obligee and must display the surety bond number.
- § 11.4.2 A rider including the following provisions shall be attached to each bond:
 - 1. This bond includes performance by the Contractor of any correction and warranty obligations in the Contract Documents, including such performance after the dates of Substantial Completion and final completion.
 - 2. Surety hereby agrees that it consents to and waives notice of any addition, alteration, omission, change, or other modification of the Contract Documents. Such addition, alteration, change,

- extension of time, or other modification of the Contract Documents, or a forbearance on the part of either the owner or the Contractor to the other, shall not release the Surety of its obligations hereunder and notice to the Surety of such matters is hereby waived.
- 3. Surety further agrees that in event of any default by the Owner in the performance of the Owner's obligations to the Contractor under the Contract, the Contractor or Surety shall cause written notice of such default (specifying said default in detail) to be given to the Owner, and the Owner shall have thirty (30) days from time after receipt of such notice within which to cure such default, or such additional reasonable period of time as may be required if the nature of such default is such that it cannot be cured within thirty (30) days. Such Notice of Default shall be sent by certified or registered U.S. Mail, return receipt requested, first class postage prepaid, to the Owner.
- § 11.4.3 All bonds shall be maintained in full force during the duration of the Project and for a period of two (2) years after the date of the Contractor's acceptance of final payment as guarantee that the Contractor will make good any faults or defects in the work arising from improper or defective workmanship or materials which may appear during the comeback warranty period.
- § 11.4.4 The Contactor shall deliver the required bonds to the Owner prior to beginning construction activity at the Project site, but no later than seven (7) days after execution of the Contract.
- § 11.4.5 The Owner may, in the Owner's sole discretion and without prior notice to the Contractor, inform surety of Contractor's Work and obtain consents as necessary to protect the Owner's rights, interest, privileges and benefits under and pursuant to any bond issued in connection with the Contractor's Work.
- § 11.4.6 If the surety on any Bond furnished by the Contractor is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of this Article, the Contractor shall within ten (10) days thereafter substitute another Performance and Payment Bond and surety, both of which must be acceptable to the Owner.
- § 11.4.7 The Contractor shall keep the surety informed of the progress of the Work, and, where necessary, obtain the surety's consent to, or waiver of: (1) notice of changes in the Work; (2) request for reduction or release of retention; (3) request for final payment; and (4) any other material required by the surety. The Owner shall be notified by the Contractor, in writing, of all communications with the surety. The Owner may, in the Owner's sole discretion, inform the surety of the progress of the Work and obtain consents as necessary to protect the Owner's rights, interest, privileges and benefits under any pursuant to any bond issued in connection with the Work.
- § 11.4.8 Notwithstanding any other provisions in any performance or payment bond, it shall not be a condition precedent to termination of a Contract or Contractor that notice be sent to or meeting be arranged or held with the Contractor (principal) and surety, prior to such termination. Any such requirement(s) shall be void and unenforceable and the Owner shall have the right to reject any such bond(s) or ignore such condition. The exclusive method of termination of a Contract or the Contractor is contained in the Contract Documents, and the Contractor and surety expressly agree to be bound thereby.
- § 11.4.9 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.
- § 11.4.10 The Contractor shall provide for the continuation of the performance bond as a maintenance bond for two (2) full years after the date of final payment request at the full final Contract Sum.
- § 11.5 Neither the procurement nor the maintenance of any type of insurance by the Owner or the Contractor shall in any way be construed or be deemed to limit, discharge, waive or release the Contractor from any of the obligations and risks imposed upon him by the Contract or to be a limitation on the nature or extent of such obligations or risks.

(Paragraphs deleted)

§ 11.6 Nothing in the Contract shall create or give to third parties any claim or right of action against the Contractor, Architect, Construction Manager or Owner beyond such as may legally exist irrespective of the Contract.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Construction Manager's or Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by either, be uncovered for their examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered which the Construction Manager or Architect has not specifically requested to observe prior to its being covered, the Construction Manager or Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or one of the other Contractors in which event the Owner shall be responsible for payment of such costs.

§ 12.2 Correction of Work

§ 12.2.1 Before or After Substantial Completion

The Owner, through its Architect or Construction Manager, shall have the authority to reject Work performed by the Contractor that does not conform to the requirements of the Drawings, Specifications, or both. The Contractor shall promptly correct Work rejected by the Construction Manager or Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Construction Manager's and Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 If, within two (2) years after the date of Substantial Completion of the Work or a designated portion of the Work, or the date of acceptance of a portion of the Work that is subject to correction or completion after the date of Substantial Completion of the Work, whichever is later, or after the date for commencement of warranties established under Section 9.8.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The obligation set forth hereunder shall survive acceptance by the Owner of the Work or termination of the Contract. The Owner shall give such notice promptly after discovery of the condition. The Contractor's Performance Bond shall remain in full force and effect through this two-year comeback correction period.

- § 12.2.2.2 The two-year period for correction of the Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.
- § 12.2.2.3 Upon completion of any Work under or pursuant to this Section 12.2, the two-year period for correction of Work in connection with the Work requiring correction shall be renewed and recommence.
- § 12.2.2.4 The obligations shall cover any repair and replacement to any part of the Work or other property caused by the defective or nonconforming Work.
- § 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.
- § 12.2.3.1 If the Contractor fails to commence to correct, repair and make good any defects in its Work within a reasonable time, not to exceed ten (10) days from the date the Contractor received written notice from the Owner per Section 12.2.2.1, the Owner may correct it in accordance with Section 2.5 and the Contractor shall, upon demand, pay to the Owner all amounts which it expends for such corrective work.
- § 12.2.3.2 In emergencies occurring during the two-year correction period, the Owner may correct any defect immediately and charge the cost to the Contractor. The Owner shall at once notify the Contractor, who may take over the

Work and make any corrections remaining after its forces arrive at the Work. Repair work not started within ten (10) days following notice to the Contractor of any defect may be considered an emergency.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner, Multiple Prime Contractors or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents. The Contractor shall also replace or repair to satisfaction of Owner any and all damage done to the building or its contents in consequence of work performed in fulfilling any applicable warranty. This clause is general in nature and will not operate to waive stipulations of other clauses that specify warranty periods in excess of two (2) years.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the two-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as determined by the Owner, with the advice of the Construction Manager and Architect. Such adjustment shall be effected whether or not final payment has been made. For this Section to apply, the Owner must accept non-conforming Work in writing specifying the non-conforming Work being accepted. Notwithstanding any acceptance by the Owner, if the Owner discovers non-conforming Work that the Owner has not expressly accepted in writing, the Owner may demand that the Contractor correct such Work as per the provisions of Article 12 hereof.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the State of New York, and the parties expressly agree that any claim, dispute, or other controversy of any nature arising out of the Contract or performance of the Work shall be commenced and maintained in New York State Supreme Court, Orange County.

§ 13.1.2 The Contractor shall at all times observe and comply with all federal, state and local laws and all laws, ordinances and regulations of the Owner, in any manner affecting the Work and all such orders decreed as exist at present and those which may be enacted later, by bodies or tribunals having jurisdiction or authority over the Work, and the Contractor shall defend, indemnify and save harmless the Owner and its Cooperative Board, officers, agents, or servants against any claim or liability arising from, or based on, a violation of any such law, ordinances, regulation, order or decree, whether by himself or by his employee or agents. Historical lack of enforcement of any law, local or otherwise, shall not constitute a waiver of Contractor's responsibility for compliance with such law in a manner consistent with the Agreement unless and until the Contractor has received written consent for the waiver of such compliance from the Owner and the agency responsible for the enforcement of such law.

§ 13.2 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 Neither the acceptance of all or any part of the work covered by the Contract; nor any payment therefore; nor any order or application for payment issued under the Contract or otherwise issued by the Owner, Architect, Construction Manager, or any board member, officer, agent or employee of the Owner; nor any permission or direction to continue with the performance of the Contract before or after its specified completion date; nor any performance by the Owner of any of the Contractor's duties or obligations; nor any aid lent to the Contractor by the Owner in its performance of such duties or obligations; nor any delay or omission by the Owner to exercise any right or remedy accruing to it under the terms of the Contract or existing at law or in equity or by statute or otherwise; nor any other thing done or omitted to be done by the Owner, its commissioners, officers, agents or employees; shall be deemed to be a release to the Contractor or its sureties from any obligations, liabilities or undertakings in connection with the Contract or the performance bond or a waiver of any provision of the Contract or of any rights or remedies to which the Owner may be entitled because of any breach thereof, excepting only a written instrument expressly providing for such release or waiver. No cancellation, rescission or annulment hereof, in whole or as to any part of the Contract, because of any breach hereof, shall be deemed a waiver of any money damages to which the Owner may be entitled because of such breach. No waiver by the Owner of any breach of the Contract shall be deemed to be a waiver of any other or any subsequent breach.
- § 13.3.3 The rights stated in these General Conditions and the Contract Documents are cumulative and not in limitation of any rights of the Owner at law or in equity.
- § 13.3.4 The Owner shall not be responsible for damages or for loss of anticipated profits on Work not performed on account of any termination of the Contractor by the Owner or by virtue of the Owner's exercise of its right to take over the Contractor's Work.
- § 13.3.5 The Owner shall not be liable to the Contractor for punitive damages on account of its termination of the Contractor or any other alleged breach of the Agreement and the Contractor hereby expressly waives its right to claim such damages against the Owner.
- § 13.3.6 The Contractor hereby expressly waives any rights it may have in law or in equity to lost bonding capacity as a result of any of the actions of the Owner, the Architect or the Construction Manager taken in connection with the Contractor's Work on the Project.
- § 13.3.7 The Contractor agrees that it waives the defense of privity of contract as between itself and each other Prime Contractor. In the event that an act or omission by a Prime Contractor or its Subcontractors of any tier causes impact, damage or loss in any form to the Contractor, then the Prime Contractor responsible in whole or in part for such impact, damage or loss agrees it is directly responsible and liable to the Contractor. The Contractor acknowledges and agrees that this waiver of the defense or privity of contract permits and requires it to commence an action or suit directly against the responsible Prime Contractor. The Owner, Architect and the Construction Manager shall not be parties to such suit. The Contractor waives and relinquishes any right and claim as against the Owner, to the extent such claim is caused, or contributed to, by a Prime Contractor or its Subcontractors of any tier.

§ 13.4 Tests and Inspections

- § 13.4.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Tests, inspections and approvals of portions of the Contractor's Work required by the Drawings or Specifications shall be made at an appropriate time. Unless otherwise provided, the Contractor shall arrange for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Construction Manager and Architect timely notice of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.
- § 13.4.2 If the Construction Manager, Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.4.1, the Construction Manager or Architect shall, upon written authorization from the Owner, instruct the Contractor to

arrange for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Construction Manager and Architect of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

- § 13.4.3 If such procedures for testing, inspection or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Construction Manager's and Architect's services and expenses shall be at the Contractor's expense, including the cost of retesting for verification of compliance if necessary until the Architect certifies that the Work in question does comply with the requirements of the Contract Documents, and none of such costs shall be included in computing the Contract Sum.
- § 13.4.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Construction Manager for transmittal to the Architect.
- § 13.4.5 If the Construction Manager or Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Construction Manager or Architect will do so promptly and, where practicable, at the normal place of testing.
- § 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.
- § 13.4.7 Any material to be furnished shall be subject to inspections and tests in the shop and field by the Architect. Shop inspection shall not relieve the Contractor of the responsibility to furnish satisfactory materials and the right is reserved to reject any material at any time before final acceptance of the Work, when in the opinion of the Architect the materials and/or workmanship do not conform to the Specification requirements.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the legal rate as required in General Municipal Law Section 106-b.

§ 13.6 Time Limits on Claims

- § 13.6.1 No action or proceeding shall lie or be maintained by the Contractor, nor anyone claiming under or through the Contractor, against the Owner upon any claim arising out of or based on the Agreement or the Contract Documents or by reason of any act or omission or requirements relating to the giving of notices and information, unless such action or proceeding shall be commenced within one (1) year after submission to the Owner of the final Application for Payment. As to a claim based upon money required to be retained for any period after the date of the final Application for Payment, such action must be commenced within six (6) months after such money becomes due and payable under the terms of the Contract. Notwithstanding, if the Contract is terminated by the Owner, any action or proceeding by the Contractor must be commenced within six (6) months after the date of such termination. The Contractor's acceptance of final payment shall constitute a release of all claims against the Owner. This provision shall not relieve the Contractor of the obligation to comply with the provisions of the law relating to notices of claim.
- § 13.6.2 Acts or failures to act occurring during the construction of the Project or following the issuance of the final certificate for payment, which give rise to a cause of action shall be deemed to have accrued in any and all events not later than the date of any act or failure to act by the Contractor pursuant to any warranty provided under Section 3.5, the date of any correction of the Work or failure to correct the Work by the Contractor under Section 12.2, or the date of actual commission of any other act or failure to perform any duty or obligation by the Contractor, whichever occurs last.

§ 13.7 No Oral Waiver or Constructive Changes

The provisions of the Contract Documents shall not be changed, amended, waived, or otherwise modified in any respect except by a writing signed by the Owner. No person is authorized on behalf of the Owner to orally change, amend, waive, or otherwise modify the terms of the Contract Documents or any of the Contractor's duties or obligations under or arising out of the Contract Documents. Any change, waiver, approval, or consent granted to the Contractor shall be limited to the specific matters stated in the writing signed by the Owner, and shall not relieve the Contractor of any other of the duties and obligations under the Contract Documents. No "constructive" changes shall be allowed.

§ 13.8 Notices Regarding Liens

The Contractor shall provide to the Owner copies of all notices of any type regarding liens received from Subcontractors, Sub-subcontractors, or suppliers to the Contractor.

§ 13.9 Wages Rates

The Contractor shall, and cause its Subcontractors to, comply with prevailing wage rate determinations as issued by the State of New York Department of Labor for the location and duration of this Project. Current wage rates for this Project are included in the Project Manual.

§ 13.10 General Provisions

Any specific requirement in this Contract that the responsibilities or obligations of the Contractor also apply to a Subcontractor is added for emphasis and is also hereby deemed to include a Subcontractor of any tier. The omission of a reference to a Subcontractor in connection with any of the Contractor's responsibilities or obligations shall not be construed to diminish, abrogate or limit any responsibilities or obligations of a Subcontractor of any tier under the Contract Documents or the applicable subcontract.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

- § 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 90 consecutive days through no act or fault of the Contractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:
 - 1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped; or
 - **.2** An act of government, such as a declaration of national emergency, that requires all Work to be stopped; or
 - .3 Because the Construction Manager has not certified or the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4 and 9.5, or because the Owner has not made payment after 14 days written notice of such failure to make payment provided that such failure is not due to a disputed amount, and except to the extent the Owner is excused from timely making all or part of any payment on a Certificate for Payment as per any other provisions of the Contract Documents.

Notwithstanding the preceding or anything else in the Contract Documents, the Contractor shall not cease or delay the progress of the Work for any reason other than one set forth in Section 9.7.1, it being agreed that monetary damages shall be an adequate remedy for the Contractor for any breach of this Agreement or the Contract Documents by the Owner.

- § 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion.
- § 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon 30 days' written notice and opportunity to cure to the Owner, terminate the Contract and recover from the Owner payment for such Work properly performed for which it has not otherwise been compensated, but in no event shall the Owner be liable to the Contractor for any prospective loss, including, but not limited to, termination expenses, loss of anticipated profits, impact damages, unabsorbed overhead, or the like. Notwithstanding the foregoing, any such payments to the Contractor shall be less any setoffs to which the Owner may be entitled as per any other provision of the Contract Documents.
- § 14.1.4 If the Work is stopped for a period of 90 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon 30 additional

days' written notice to the Owner, Construction Manager and Architect (during which the Owner shall have the right and opportunity to cure), terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

- § 14.2.1 The Owner may terminate the Contract if the Contractor
 - refuses or fails to supply enough properly skilled workers or proper materials or equipment to complete the Work in a diligent, efficient, timely, workmanlike, skillful, and careful manner;
 - .2 fails to make payment to Subcontractors or Suppliers for materials or labor in accordance with the respective agreements between the Contractor and its Subcontractors or Suppliers;
 - .3 disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority, or its health and safety plan;
 - .4 otherwise is guilty of substantial breach of or default under a provision of the Contract Documents;
 - cannot complete the Work within the Contract Time or within the time to which such completion may have been extended; provided, however, that the impossibility of timely completion is, in the Owner's opinion, attributable to conditions within the Contractor's control;
 - .6 breaches any warranty made by the Contractor under or pursuant to the Contract Documents;
 - .7 is or has been unnecessarily or unreasonably or willfully delaying the performance and completion of the Work, or the award of necessary subcontracts, or the placing of necessary material and equipment orders:
 - .8 fails to furnish the Owner with assurances satisfactory to the Owner evidencing the Contractor's ability to complete the Work in compliance with all requirements of the Contract Documents;
 - .9 refuses to proceed with the Work or extra work when and as directed by the Owner, Construction Manager or Architect;
 - fails after commencement of the Work to proceed continuously with the construction and completion of the Work for more than 10 days, except as permitted under the Contract Documents;
 - .11 fails or neglects to complete the Work within the Contract Time or in accordance with the Construction Schedule:
 - .12 refuses or fails to correct deficient Work performed by it;
 - .13 the Contractor's progress of the Work is such that the Owner reasonably believes that the Contractor shall not be able to achieve Substantial Completion by the Substantial Completion Date and the Contractor has not delivered and implemented a recovery plan required under the Contract or has not recovered the schedule sufficient to meet the respective Contract Time requirements as required by written notice to the Contractor by the Owner; or
 - disregards the instructions of the Construction Manager, Architect or Owner (when such instructions are based on the requirements of the Contract Documents).
- § 14.2.2 When any of the above reasons exist, the Owner may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven (7) days' written notice, terminate employment of the Contractor at the expiration of such seven (7) day period, and may, subject to any prior rights of the surety:
 - .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor and take possession of materials stored off-site by the Contractor;
 - .2 Accept assignment of subcontracts pursuant to Section 5.4; and
 - .3 Finish the Work by whatever reasonable method the Owner may deem expedient utilizing for such purpose such of the Contractor's plant, materials, equipment, tools and supplies remaining on the site, and also such subcontractors as it may deem advisable, or if may call upon the Contractor's surety at its own expense to do so. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work. Such accounting shall be final, binding and conclusive upon the Contractor, its surety, and any person claiming under or through the Contractor, as to the amount thereof.
- § 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.
- § 14.2.4 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.

- § 14.2.4.1 The costs of finishing the Work also include, without limitation, all reasonable attorneys' fees incurred in responding to the default and enforcing the Owner's rights and remedies under the Contract Documents, additional title costs, insurance, additional interest because of any delay in completing the Work, loss of State Building Aid, and all other direct and consequential damages incurred by the Owner by reason of the termination of the Contractor as stated herein.
- §14.2.4.2 It is recognized that: (1) if an order for relief is entered on behalf of Contractor pursuant to Title 11 of the United States Code, (2) if any other similar order is entered under any other debtor relief laws, (3) if Contractor makes a general assignment for the benefit of its creditors, (4) if a receiver is appointed for the benefit of its creditors, or (5) if a receiver is appointed on account of its insolvency, any such event could impair or frustrate Contractor's performance of the Contract. Accordingly, it is agreed that upon the occurrence of any such event, Owner shall be entitled to request of Contractor or its successor in interest adequate assurance of future performance in accordance with the terms and conditions of the Contract. Failure to comply with such request within ten (10) days of delivery of the request, or Owner's determination that the assurances are not adequate, shall entitle Owner to terminate the Contract and to the accompanying rights set forth in Subparagraphs 14.2.1 through 14.2.4 hereof. In all events pending receipt of adequate assurance of performance and actual performance in accordance therewith, Owner shall be entitled to proceed with the Work with its own forces or with other Contractors on a time and material or other appropriate basis, the cost of which will be back charged against the Contract Sum.
- § 14.2.5 If the Owner wrongfully terminates the Contract for cause, the rights, remedies and obligations of the parties will be the same as if the Owner had terminated the Contract for convenience under Section 14.4.
- § 14.2.6 In the event that the Contractor, or the Contractor's surety, challenges the Owner's termination of the Contract for cause, and the Owner prevails in litigation in connection with such challenge, whether initiated by the Owner or by the Contractor or the Contractor's surety, the Owner shall be entitled to its costs, including reasonable attorney's fees, incurred as a result of such litigation, as part of any judgment against the Contractor or the Contractor's surety. Such costs, including reasonable attorney's fees, shall be deemed a cost of finishing the Work.

§ 14.3 Suspension by the Owner for Convenience

- § 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine. The Owner shall incur no liability by reason of such suspension, delay, or interruption except that the Contractor may request an extension of its time to complete its Work in accordance with Article 8 hereof.
- § 14.3.2 The Contract Time shall be adjusted for increases in time caused by suspension, delay or interruption as described in Section 14.3.1. No adjustment shall be made to the extent:
 - .1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
 - .2 that an equitable adjustment is made or denied under another provision of this Contract.

§ 14.4 Termination by the Owner for Convenience

- § 14.4.1 The Owner may, at any time, terminate the whole or any portion of the Contract for the Owner's convenience and without cause upon not less than seven (7) days' written notice to the Contractor. Notwithstanding any other provision to the contrary in the Contract, the Owner reserves the right at any time and in its absolute discretion to terminate the services of the Contractor or the Work by giving written notice to the Contractor. This termination for convenience of the Owner provision allows and authorizes the Owner to terminate this Contract at any time and for any reason whatsoever. This right may be exercised by the Owner in its complete discretion. Termination by the Owner under this Section shall be by Notice of Termination delivered to the Contractor specifying the extent of termination and the effective date.
- § 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall immediately and in accordance with instructions from the Owner:

User Notes:

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work;
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders; and
- **.4** proceed to complete the performance of the Work required under portions of the Contract not terminated, if any.

§ 14.4.3 Upon receipt of written notice of the Owner's exercise of such termination, the Contractor shall, as the Contractor's sole and exclusive remedy, be paid for the Work properly executed in accordance with the Contract Documents prior to the effective date of termination and for items properly fabricated off-site, delivered and stored in accordance with the Owner's instructions or the Contract Documents before such effective date. The Contractor's entitlement to payment for all such work shall be predicated on its performance of such work in accordance with the Contract Documents as certified by the Architect and Construction Manager. The Contractor shall be entitled to no other payment and waives any claim for damages including, but not limited to, lost profits, any prospective loss, underutilization of personnel or equipment, unabsorbed overhead, and any and all items of consequential loss or damage. The Owner shall be entitled to credit against any payment to be made to the Contractor pursuant to this Section 14.4 the following: (1) payments previously made to the Contractor for the terminated portion of the Work; (2) claims which the Owner has against the Contractor under the Contract Documents; and (3) the value of the materials, supplies, equipment, or other items that are to be disposed of by the Contractor, the cost of which is included in the Contract Sum. Notwithstanding the foregoing, in the event of a termination under Section 14.4.1 prior to the issuance of a Notice to Proceed, the Contractor shall not be entitled to any compensation whatsoever.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. Neither a Request for Information, nor a Construction Change Directive, nor a Change Order, nor a reservation of rights, nor minutes of a meeting, nor a daily report, nor any log entry, nor an Owner's request for or the Contractor's response to a Change Order proposal, nor notice of a potential or future claim shall constitute a Claim.

§ 15.1.2 Time Limits on Claims

(Paragraph deleted)

§ 15.1.2.1 Claims by the Contractor must be initiated by written notice to the Owner and the Initial Decision Maker. Claims by the Contractor must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the Contractor first recognizes the condition giving rise to the Claim, whichever is earlier.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by the Contractor must be initiated by written notice to the Owner and to the Architect with a copy sent to the Construction Manager within the time limits set forth in Section 15.1.2.1 above. The purpose of the written notice is to give the Owner prompt opportunity: (a) to cancel or revise orders or directions, change plans, mitigate or remedy circumstances giving rise to the Claim or to take other action that may be desirable; (b) to monitor and verify the facts and circumstances as they occur; and (c) to verify any costs and expenses claimed by the Contractor contemporaneously as they are incurred. Written notice is required whether or not the Owner, Construction Manager or Architect is aware of the facts or circumstances that constitute the basis for the Contractor's Claim, and no action or conduct of the Owner, Construction Manager, Architect or any other person will be regarded as a waiver of such notice requirement except only a written statement to such effect signed by the Owner. Failure of the Contractor to give written notice as required by this Section shall be deemed conclusively to be a waiver and release of any Claim, and such written notice shall be a condition precedent to the Contractor's right to make any Claim arising out of, under or in connection with the Contract or its performance of the Work.

§ 15.1.3.2 Written notice shall contain a heading stating "Notice of Claim" to clearly identify it as such. Such notice shall set forth in detail the circumstances that form the basis for the Claim and shall include the following: (1) a clear statement of the claim, including background and chronology; (2) documentation in support of the claim; (3) documentation in support of claimed damages; and (4) certification by responsible officer of the Contractor. The

responsibility to substantiate Claims shall rest with the Contractor. An additional Claim arising from the same occurrence or condition made after the Initial Claim has been implemented by Change Order shall not be considered.

§ 15.1.3.3 The Contractor agrees that it has and will make no claim for damages against the Owner by reason of any act or failure to act by any other Contractor, Separate Contractor or Subcontractors having contracts for performance of any portion of work of the Project or in connection with the Owner's, Architect's or Construction Manager's acts or omissions to act in connection with such other Contractors, Separate Contractors or Subcontractors.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim by the Contractor, except as otherwise agreed in writing or as provided in Section 9.7, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments of undisputed amounts in accordance with the Contract Documents; provided, however, that the Contractor shall use its best efforts to furnish the Architect and Owner, as expeditiously as possible, with notice of any Claim including, without limitation, those in connection with concealed or unknown conditions, once such Claim is recognized, and shall cooperate with the Architect and the Owner in any effort to mitigate the alleged or potential damages, delay or other adverse consequences arising out of the condition which is the cause of such a Claim. The Construction Manager will prepare Change Orders and the Architect will issue a Certificate for Payment or Project Certificate for Payment in accordance with the decisions of the Initial Decision Maker.

(Paragraph deleted)

§ 15.1.5 Claims for Additional Cost. If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.3. The Contractor agrees that an express condition precedent to the Contractor's entitlement to any increase in the Contract Sum shall be full and complete compliance to the satisfaction of the Owner with the requirements of Article 15. The Contractor acknowledges the no damages for delay provisions set forth in Sections 8.3.2 and 15.1.6.1.4 hereof.

- § 15.1.5.1 The Contractor shall not be entitled to any adjustment in the Contract Sum or Contract Time if:
 - The Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner in respect of Contract Sum and Contract Times by the submission of a bid or becoming bound under a negotiated contract; or
 - .2 The existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test or study of the site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for the Contractor prior to Contractor's making such final commitment;
 - .3 The Contractor failed to give the written notice within the time and as required by Section 15.1.2; or
 - If the Owner and the Contractor are unable to agree on entitlement to or as to the amount or length of any such equitable adjustment in the Contract Sum or Contract Times, a claim may be made therefore as provided in Article 15. However, the Owner, Construction Manager, and Architect shall not be liable to the Contractor for any claims, costs, losses or damages sustained by the Contractor on or in connection with any other project or anticipated project.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Sections 15.1.2 and 15.1.3 shall be given. The Contractor's Claim shall include an estimate of the probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary.

§ 15.1.6.1.1 An application for extension of time must set forth in detail the circumstances that form the basis for the Claim, the date upon which each cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work and the number of days' increase in the Contract Time claimed as a consequence of each such cause of delay. The Contractor shall provide such supporting documentation as the Owner, Construction Manager or Architect may require including, where appropriate, a revised construction schedule indicating all the activities affected by the circumstances forming the basis of the Claim for an increase in the Contract Time.

- § 15.1.6.1.2 The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which may have concurrent or interrelated effects on the progress of the Work, or for concurrent delays due to the fault of the Contractor.
- § 15.1.6.1.3 The Contractor agrees that an express condition precedent to the Contractor's entitlement to any extension of the Contract Time shall be full and complete compliance to the satisfaction of the Owner with the requirements of Articles 8 and 15.
- § 15.1.6.1.4 The Owner shall not be liable to the Contractor or any of its Subcontractor for claims, impact costs, extended general conditions, unabsorbed overhead, or delay damages of any nature caused by or arising out of delay, disruption, interference, inefficiencies, impedance, hindrance, acceleration, resequencing, schedule impacts, lack of timeliness by the Owner or its Architect or Construction Manager, and lack of coordination or scheduling, cumulative impact of multiple change orders, errors or omissions in the design of the Project, delay and other performance impacts. The sole remedy against the Owner for such delays shall be the allowance of additional time for completion of the Work, the amount of which shall be subject to the Claims procedure set forth herein. Except 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, extended general conditions, directions given or not given by the Owner, Construction Manager, or Architect, including scheduling and coordination of the Work; the Architect's preparation of drawings and specifications or the Construction Manager's or Architect's review of shop drawings and requests for instructions; errors or omissions in the design of the Project; or, on account of any delay, disruption, interference, impedance, inefficiency, lack of productivity, obstruction or hindrance for any cause whatsoever by the Owner, Construction Manager, Architect or any other Contractor or Separate Contractor on the Project whether or not foreseeable or anticipated. The Contractor agrees that its sole right and remedy therefore shall be an extension of time, if appropriate. It is emphasized that no monetary recovery may be obtained by the Contractor for delay against the Owner, Construction Manager, Architect, other Contractor or Separate Contractor based on any reason and that the Contractor's sole remedy, if appropriate, is additional time.
- § 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction. In planning his construction schedule within the agreed Contract Time, it shall be assumed that the Contractor has anticipated the amount of adverse weather conditions normal to the site of the Work for the season or seasons of the year involved. Only those weather delays attributable to other than normal weather conditions will be considered by the Architect.
- § 15.1.7 Waiver of Claims for Consequential Damages. The Contractor waives any and all claims for consequential damages of any kind and nature arising out of or relating to this Contract. This (Paragraphs deleted)

waiver includes, without limitation, damages incurred by the Contractor for principal office expenses including compensation for personnel stationed there, unabsorbed overhead, for losses of financing, business and reputation, and loss of profit and anticipated profit. This waiver of consequential damages shall survive termination of the Contract.

§ 15.2 Initial Decision

- § 15.2.1 Claims by the Contractor, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims by the Contractor excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to binding dispute resolution of any Claim. If an initial decision has not been rendered within 30 days after the Contractor's Claim has been referred to the Initial Decision Maker, the Contractor may proceed with binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.
- § 15.2.2 The Initial Decision Maker will review Claims by the Contractor and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker

concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

- § 15.2.3 In evaluating Claims by the Contractor, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.
- § 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim by the Contractor or to furnish additional supporting data, such party shall respond, within 10 days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim by the Contractor in whole or in part.
- § 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim by the Contractor, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect and Construction Manager, if the Architect or Construction Manager is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to binding dispute resolution.
- § 15.2.6 Intentionally omitted.
- § 15.2.6.1 Intentionally omitted.
- § 15.2.7 Intentionally omitted.
- § 15.2.8 If a Claim by the Contractor relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

ARTICLE 16 SPECIAL CONDITIONS

- § 16.1 Equal Opportunity
- § 16.1.1 The Contractor shall maintain policies for equal employment opportunity for construction employment. During performance of the Agreement, the Contractor agrees as follows:
- § 16.1.2 The Contractor and its Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin. The Contractor shall take affirmative action to ensure that all applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship and on-the-job training.
- § 16.1.3 The Contractor will post and keep posted in conspicuous places, for employees and applicants for employment, notices obtained by the Contractor from the New York State Division of Human Rights as set forth in the General Regulations of that Division at 9 NYCRR 466.1(a), such conspicuous places to be as defined in 9 NYCRR 466.1(b), and such other postings as that Division may require with respect to New York State's laws, codes, rules, and regulations governing discrimination in employment.
- § 16.1.4 The Contractor will state in all solicitations or advertisements for employees placed by, or on behalf, of the Contractor, that all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color or national origin.
- § 16.1.5 The Contractor will comply with provisions of Sections 290-299 of the Executive Law and with the Civil Rights Law, will furnish all information and reports deemed necessary by the State Commissioner of Human Rights under these non-discrimination clauses and such sections of the Executive Law, and will permit access to the Contractor's books, records and accounts by the Owner, the State Commissioner of Human Rights, the Attorney

General and the Industrial Commissioner for the purposes of investigation to ascertain compliance with these nondiscrimination clauses and such sections of the Executive Law and Civil Rights Law.

§ 16.1.6 The Contractor will send to each labor union, or representatives of workers, with which it has, or is bound by a collective bargaining or other Agreement or understanding notices obtained from the State Commissioner of Human Rights, advising such Labor Union or representative of the Contractor's Agreement under requirements of this Article. If the Contractor was directed to do so by Owner as part of the Bid, the Contractor shall request such labor union or representative to furnish him with a written statement that such labor union or representative will not discriminate because of race, creed, color or national origin and that such labor union or representative either will affirmatively cooperate within the limits of its legal and contractual authority in the implementation of the policy and provisions of these non-discrimination clauses or that it consents and agrees that recruitment accordance with the purposes and provisions of these non-discrimination clauses. If such labor union or representative fails or refuses to comply with such a request that it furnish such a statement, the Contractor shall promptly notify the Owner and State Commissioner of Human Rights of such failure or refusal.

§ 16.1.7 The Agreement may be forthwith canceled, terminated or suspended in whole, or in part, by Owner upon the basis of a finding made by the State Division of Human Rights, that the Contractor has not complied with these non-discrimination clauses, and the Contractor may be declared ineligible for future Contracts made by, or in behalf of, the State, or Authority or Agency of the State, or Housing Authority or an Urban Renewal Agency, or Contracts requiring the approval of the Commissioner of Housing and Community Renewal, until it has satisfied the State Division of Human Rights, that it has established and is carrying out a program in conformity with the provisions of these non-discrimination clauses. Such findings shall be made by the State Division of Human Rights after conciliation efforts by the Division have failed to achieve compliance with these non-discrimination clauses and after a verified complaint has been filed with the Division, notice thereof has been given to the Contractor, and an opportunity has been afforded by the Contractor to be heard publicly in accordance with the Executive Law. Such sanctions may be imposed and remedies invoked immediately of, or in addition to sanction in remedies otherwise provided by law. If the Agreement is canceled or terminated under provisions of this Article, in addition to other rights of Owner provided in the Agreement upon its breach by the Contractor, the Contractor will hold Owner harmless against any additional expenses or costs incurred by Owner in completing the work or in purchasing the services, materials, equipment or supplies contemplated by Agreement and Owner may withhold payments from the Contractor in an amount sufficient for this purpose and recourse may be had against authority on the Performance Bond if necessary.

§ 16.1.8 The Contractor will include the provisions of this Article in every subcontract or purchase order in such a manner that such provisions will be binding upon each subcontractor or vendor as to operations to be performed within the State of New York. The Contractor will take such action in enforcing such provisions of such subcontractor or purchase order as the State Division of Human Rights or the Owner may direct, including sanctions or remedies for non-compliance. If the Contractor becomes involved in or is threatened with litigation with a subcontractor or a vendor, as a result of such direction by the State Division of Human Rights, the Contractor shall promptly so notify the Owner and the Attorney General, requesting the Attorney General to intervene and protect the interests of the State of New York.

§ 16.2 Waiver of Immunity

§ 16.2.1 The Contractor hereby agrees to the provisions of Paragraph 139-a and 139-b of the New York State Finance Law and Section 103-a of the New York General Municipal Law, which require that upon the refusal of a person, when called before a grand jury, head of a State department, temporary State commission or other State agency, or the organized crime task force in the Department of Law, which is empowered to compel the attendance of witnesses and examine them under oath, to testify in an investigation concerning any transaction or contract had with the State, any political subdivision thereof, a public authority or with any public department, agency or official of the State or of any political subdivision thereof or of a public authority, to sign a waiver of immunity against subsequent criminal prosecution or to answer any relevant question concerning such transaction or contract.

§ 16.2.1.1 Such person, and any firm, partnership or corporation of which he is a member, partner, director or officer shall be disqualified from thereafter selling to or submitting bids to or receiving awards from or entering into any contracts with New York State or any public department, agency or official thereof for goods, work or services, for a period of five years after such refusal.

(Paragraph deleted)

§ 16.2.1.2 Any and all contracts made with the State of New York, or any public department, agency or official thereof since the effective date of this law, by such person, and by an firm, partnership or corporation of which he is a member, partner, director or officer may be canceled or terminated by the State of New York without incurring any penalty or damages on account of such cancellation or termination, but any moneys owning by the State of New York for goods delivered or work done prior to the cancellation or termination shall be paid.

§ 16.3 Non-Collusive Clause as Required by NYS General Municipal Law Section 103-d

(Paragraph deleted)

§ 16.3.1 Every bid or proposal hereafter made to a political subdivision of the state or any public department, agency or official thereof where competitive bidding is required by statute, rule, regulation or local law, for work or services performed or to be performed or goods sold or to be sold, shall contain the following statement subscribed by the bidder and affirmed by such bidder as true under the penalties of perjury: Non-collusive bidding certification.

(Paragraph deleted)

§ 16.3.2 By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief, the following:

(Paragraph deleted)

- § 16.3.2.1 The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competitions, as to any matter relating to such prices with any other bidder or with any competitor.
- § 16.3.2.2 Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor.

(Paragraph deleted)

- § 16.3.2.3 No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
- § 16.3.3 A bid shall not be considered for award nor shall any award be made where requirements of this Article have not been complied with; provided however, that in any case the bidder cannot make the foregoing certification, the bidder shall so state and shall furnish with the bid a signed statement which set forth in detail the reasons therefore. Where requirements of this Article have not been complied with, the bid shall not be considered for award nor shall any award by made unless the head of the purchasing agent of the political subdivision, public department, agency or official thereof to which the bid is made, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

(Paragraph deleted)

- § 16.3.4 The fact that a bidder (a) has published price lists, rates, or tariffs covering items being procured, (b) has informed prospective customers of proposed, or pending, publication of new or revised price list for such items, or (c) has sold the same items to other customers at the same prices being bids, does not constitute a disclosure within the meaning of this Article.
- § 16.3.5 Any bid hereafter made to any political subdivision of the state or any public department, agency official thereof by a corporate bidder for work or services performed or to be performed or good sold or to be sold, where competitive bidding is required by statute, rule, regulation, or local law, and where such bid contains the certification referred to in subdivision one of this section, shall be deemed to have been authorized shall be deemed to include the signing and submission of the bid and the inclusion therein of the certificate as to non-collusion as the act and deed of the corporation.

(Paragraph deleted)

§ 16.4 Assignment of Public Contracts

As provided in Section 109 of the General Municipal Law, the Contractor is prohibited from assigning, transferring, conveying, subletting or otherwise disposing of the same, or of his right title, or interest therein, or his power to execute such contract or any other person or corporation without the previous consent in writing of the officer, board or agency awarding the contract. If any contractor, to whom any contract is let, granted and awarded, as required by law, by any officer, board or agency in a political subdivision, or of any district therein, shall without the previous written consent specified in subdivision one of this section, assign, transfer, convey, sublet or otherwise dispose of such contract, or his right, title or interest therein, or his power to execute such contract, to any other person or corporation, the officer, board or agency which let, made, granted, or awarded such contract shall revoke and annul such contract, and the political subdivision or district therein, as the case may be, and such officer, board or agency shall be relieved and discharged form any and all liability and obligations growing out of such contract to such contractor, and to the person or corporation to which such contract shall have been assigned, transferred, conveyed, sublet or otherwise disposed of, and such contractor, and his assignees, transferees or sublessees shall forfeit and lose all moneys, theretofore earned under such contract, except so much as may be required to pay his employees. The provisions of this section shall not hinder, prevent, or affect an assignment by any such contractor for the benefit of his creditors made pursuant to the laws of this state.

§ 16.5 Fingerprinting

Pursuant to the Safe Schools Against Violence in Education Act ("SAVE" legislation) and Part 87 of the Regulations of the Commissioner of Education, any individual who, as a result of their work on this capital project, will move (or migrate) in and out of student occupied areas for more than five (5) days a year, must be fingerprinted. The Contractor shall be responsible to ensure that it (and its employees) are in full compliance with the fingerprinting provisions New York's SAVE Legislation and Part 87 of the Regulations of the Commissioner of Education at the Contractor's sole cost and expense.

(Paragraph deleted)

ARTICLE 17 NEW YORK STATE LABOR LAW REQUIREMENTS

§ 17.1 Working Hours

(Paragraph deleted)

§ 17.1.1 The Contractor specifically agrees as required by the New York State Labor Law ("Labor Law"), Sections 220 and 220-d, as amended, that:

- No laborer, worker, or mechanic in the employ of the Contractor, Subcontractor or other person doing or contracting to do the whole or any part of the work included in the Contract Documents shall be permitted or required to work more than eight hours in any one calendar day or more than five (5) days in any one week, except to the extent permitted in the case of extraordinary emergencies described in the Labor Law.
- The wages to be paid to each laborer, worker, or mechanic in the employ of the Contractor, Subcontractor, or other person doing or contracting to do all or any part of the work included in the Contract Documents for a legal day's work shall be not less than the prevailing rate of wages as defined by the Labor Law.
- Each laborer, workman or mechanic employed by the Contractor, a Subcontractor, or other person doing or contracting to do all or any part of the work included in the Contract Documents shall be provided the supplements required by Article 8 of the Labor Law.
- The minimum hourly rate of wage to be paid shall be not less than that stated in the General Conditions, and shall be as designated by the industrial Commissioner.
- The Contractor's and any Subcontractor's or other person's filing of payrolls in a manner prescribed by subdivision 3-a of Section 220 of the Labor Law shall be a condition precedent to the to the Owner's payment of any sums due and owing to the Contractor, Subcontractor or other party for work done on or with respect to the Project.

§ 17.2 Wage Rates

(Paragraph deleted)

§ 17.2.1 The Contractor specifically agrees, as required by the Labor Law, that the Contract may be forfeited and no sum paid for any work done thereunder on a second conviction for willfully paying less than:

- the prevailing wage rates as provided in Labor Law Section 220(3) as amended, or, .1
- .2 the minimum wage rates as provided in Labor Law Section 220-d, as amended.

§ 17.2.2 The Contractor shall comply with Prevailing Wage Rates as issued by the State of New York Department of Labor for the location and duration of this Project. Current wage rates for this project are included in the Project Manual as part of the Contract Documents. The Contractor is responsible to regularly review "Prevailing Wage Schedules/Updates" available on the "Prevailing Wage/Public Work" link on State of New York Department of Labor "Business in New York" web page (www.labor.state.ny.gov) to identify and implement any applicable changes to Prevailing Wage Rates during the Project.

(Paragraph deleted)

§ 17.2.3 The Contractor shall comply with all the requirements of the Labor Law Section 220-a, as amended, regarding mandatory submission of certified payroll records, which shall be included with each application for payment.

(Paragraphs deleted)

§ 17.3 Anti-Discrimination

- § 17.3.1 The Contractor specifically agrees, as required by the provisions of Section 220-e of the Labor Law, as amended, that:
 - .1 In the hiring of employees for the performance of work under the Contract or any subcontract hereunder, no contractor, subcontractor, nor any person acting on behalf of such contractor or subcontractor, shall be reason of race, creed, color, sexual orientation, or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the work to which the employment relates;
 - .2 No contractor, subcontractor, nor any person on its behalf, shall in any manner, discriminate or intimidate any employee hired for the performance of work under the contact on account of race, creed, color, sexual orientation, or national origin.
 - .3 There may be deducted from the amount payable to the Contractor by the Owner under the contract a penalty at fifty dollars for each person for each calendar day during which such person was discriminated against or intimidated in violation of the provisions of the contract; and
 - .4 The Contract may be canceled or terminated by the Owner, and all monies due or to become due thereunder may be forfeited for a second or any subsequent violation of the terms or conditions of this section of the Contract.

ARTICLE 18 GENERAL MUNICIPAL LAW REQUIREMENTS OF THE STATE OF NEW YORK

§ 18.1 Payment of Contractors and Subcontractors

§ 18.1.1 The Contractor specifically agrees it is bound by Section 106-b of the New York General Municipal Law.

ARTICLE 19 SPECIFIC CONFORMANCE TO THE LAWS OF THE STATE OF NEW YORK

§ 19.1 Statutory Requirements

§ 19.1.1 The parties agree that each is bound to the provisions of the laws of the State of New York governing bidding and contracting for public improvement projects, including but not limited to applicable provisions of the General Obligations Law, Labor Law, and General Municipal Law. To the extent any provisions in the Contract Documents conflict with any provisions of New York Law, the statutory provisions shall prevail and the conflicting provisions in the Contract Documents shall be deemed to conform to the statutory provisions.

§ 19.1.2 To the extent the laws of the State of New York governing bidding and contracting for public improvement projects mandate inclusion of specific terms in contracts for such improvements, but which are not already included in these General Conditions, such terms shall be deemed and hereby are incorporated into these General Conditions.

OWNER'S INSURANCE REQUIREMENTS

- 1. Notwithstanding any terms, conditions or provisions, in any other writing between the parties, the contractor hereby agrees to effectuate the naming of Orange Ulster BOCES, the Architect, their Consultants and Subconsultants as an Additional Insured on the contractor's insurance policies, except for workers' compensation and N.Y. State Disability insurance.
- 2. The policy naming the District as an Additional Insured shall:
 - **a.** Be an insurance policy from an A.M. Best A- rated or better insurer, **licensed and admitted** to conduct business in New York State. A New York licensed and admitted insurer is **required.**
 - b. State that the organization's coverage shall be primary and non-contributory coverage for Orange Ulster BOCES, its Board, employees and volunteers and the Architect, their Consultants and Subconsultants (KG+D Architects and all consultants listed on the cover of the project/specifications manual), and the Construction Manager (if applicable) including a waiver of subrogation in favor of Orange Ulster BOCES for all coverages including Workers Compensation.
 - c. Additional insured status for General Liability coverage shall be provided by standard or other endorsements that extend coverage to Orange Ulster BOCES for on-going operations (CG 20 38 or equivalent) and products and completed operations (CG 20 37 or equivalent). The decision to accept an endorsement rest solely with the Orange Ulster BOCES. A completed copy of the endorsements must be attached to the Certificate of Insurance to include General Liability, Auto Liability and Umbrella/Excess coverages.
- 3. a. The certificate of insurance must describe **all services** provided by the contractor (e.g., roofing, carpentry or plumbing) that are covered by the liability policies.
 - b. At Orange Ulster BOCES' request, the contractor shall provide a copy of the declaration page of the liability and umbrella/excess policies with a list of endorsements and forms. If requested, the contractor will provide a copy of the policy endorsements and forms.
 - c. There will be no coverage restrictions and/or exclusions involving New York State Labor Law statutes or gravity related injuries.
 - d. No policies containing escape clauses or exclusions contrary to the Owner's interests will be accepted.
 - e. 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.

4. The contractor agrees to indemnify Orange Ulster BOCES for applicable deductibles and self- insured retentions.

5. Minimum Required Insurance:

a. Commercial General Liability Insurance

\$1,000,000 per Occurrence/\$2,000,000 Aggregate \$2,000,000 Products and Completed Operations \$1,000,000 Personal and Advertising Injury \$100,000 Fire Damage \$10,000 Medical Expense The general aggregate shall apply on a per-project basis.

b. Owners Contractors Protective (OCP) Insurance

For projects less than or equal to \$1,000,000 and/or work on 1 story (10 feet) only; \$1,000,000 per occurrence, \$2,000,000 aggregate with Orange Ulster BOCES as the Named 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 Orange Ulster BOCES as the Named Insured.

The OCP Policy must be with a NYS licensed and admitted carrier.

Orange Ulster BOCES will be the Named Insured on OCP Policies. There will be no Additional Insureds on any OCP Policies.

c. Automobile Liability

\$1,000,000 combined single limit for owned, hired, borrowed and non-owned motor vehicles.

d. Workers' Compensation and NYS Disability Insurance

Statutory Workers' Compensation (C-105.2 or U-26.3); and NYS Disability Insurance (DB-120.1) for all employees. Proof of coverage must be on the approved specific form, as required by the New York State Workers' Compensation Board. ACORD certificates are not acceptable. A person seeking an exemption must file a CE-200 Form with the state. The form can be completed and submitted directly to the WC Board online.

e. Builder's Risk

Must be purchased and maintained by the Owner to include interest of the Owner, Contractor, Subcontractors and Sub subcontractors jointly. The limit must reflect the total completed value (all material and labor costs) and provide coverage for fire, lightning, explosion, extended coverage, vandalism, malicious mischief,

windstorm, hail and/or flood. Coverage will remain in effect until the Owner is the only entity that has an insurable interest in the property.

f. Umbrella/Excess Insurance

\$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.

- 6. Contractor acknowledges that failure to obtain such insurance on behalf of Orange Ulster BOCES constitutes a material breach of contract and subjects it to liability for damages, indemnification and all other legal remedies available to Orange Ulster BOCES. The contractor is to provide Orange Ulster BOCES with a certificate of insurance, evidencing the above requirements have been met, prior to the commencement of work. The failure of Orange Ulster BOCES to object to the contents of the certificate or the absence of same shall not be deemed a waiver of any rights held by Orange Ulster BOCES.
- 7. Subcontractors are subject to the same terms and conditions as stated above and must submit same to the District/BOCES for approval prior to the start of any work.
- 8. In the event the General Contractor fails to obtain the required certificates of insurance from the Subcontractor and a claim is made or suffered, the General Contractor shall indemnify, defend, and hold harmless Orange Ulster BOCES, its Board, employees and volunteers, the Architect, their Consultants and Subconsultants (KG+D Architects and all consultants listed on the cover of the project/specifications manual), and the Construction Manager (if applicable) 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.

ADDITIONAL REQUIREMENTS ASBESTOS, LEAD ABATEMENT AND/OR HAZARDOUS MATERIALS

Asbestos/Lead Abatement/Pollution Liability Insurance

\$2,000,000 per occurrence/\$2,000,000 aggregate, including products and completed operations. Such insurance shall include coverage for the Contractor's operations including, but not limited to, removal, replacement, enclosure, encapsulation and/or disposal of asbestos, or any other hazardous material, along with any related pollution events, including coverage for third-party liability claims for bodily injury, property damage and clean-up costs. If a retroactive date is used, it shall pre-date the inception of the Contract.

25 October 2024 44-90-00-00-0-009-036 Bid Issue Orange-Ulster BOCES Emanuel Axelrod Special Education Center Additions & Alterations

If the Contractor is using motor vehicles for transporting hazardous materials, the Contractor shall maintain pollution liability broadened coverage (ISO Endorsement CA 9948 or CA 01 12), as well as proof of MCS 90. Coverage shall fulfill all requirements of these specifications and shall extend for a period of three (3) years following acceptance by Orange Ulster BOCES of the Certificate of Completion.

Testing Company Errors and Omission Insurance

\$1,000,000 per occurrence/\$2,000,000 aggregate for the testing and other professional acts of the Contractor performed under the Contract with Orange Ulster BOCES.

PROJECT LABOR AGREEMENT

1.1 REQUIREMENT FOR PROJECT LABOR AGREEMENT

- A. As a condition of being awarded a contract for work covered by the Bid Documents, the successful Bidder agrees to enter into, become signatory to, and to abide by, the provisions of the Project Labor Agreement negotiated on behalf of the Owner by the Palombo Group with the Hudson Valley Building and Construction Trades Council, AFLCIO and the signatory local unions. A copy of this Project Labor Agreement ("PLA") is attached to this Section 007013.
- B. The successful Bidder shall require any and all of its subcontractors of any tier on the ORANGE ULSTER BOCES CAPITAL IMPROVEMENT PROJECTS, including this Project, the Additions and Alterations to Emanuel Axelrod Special Education Center, to become signatory to, and to abide by, the PLA.

1.2 APPRENTICE TRAINING PROGRAMS

- A. As required by Section 222 of the New York Labor Law, the Owner will require each contractor and subcontractor performing work on the Project to participate in apprentice training programs in the trades of work it employs.
- B. Each such apprentice training program must have at least one apprentice currently enrolled in the program and must have been approved by the New York State Department of Labor for not less than three (3) years.

1.3 DESIGN AND CONSTRUCTION

A. As required by Section 222 of the New York Labor Law, the design of the Project shall be subject to the review and approval of the Owner and the design and construction standards of the Project shall be subject to the review and approval of the Owner.

1.4 APPLICABLE PLA

A. A copy of the PLA is attached to this Section 007013

PROJECT LABOR AGREEMENT

COVERING CONSTRUCTION OF

ORANGE-ULSTER BOCES

CAPITAL IMPROVEMENT

PROJECTS

September 8, 2023

ORANGE - ULSTER BOCES CAPITAL IMPROVEMENT PROJECTS PROJECT LABOR AGREEMENT

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PROJECT LABOR AGREEMENT

PREAMBLE

WHEREAS, ORANGE - ULSTER BOCES desires to provide for the cost efficient, safe, quality, and timely completion of the ORANGE - ULSTER BOCES CAPITAL IMPROVEMENT PROJECTS in a manner designed to afford the lowest reasonable costs to the BOCES and component districts, and the committee they represent, and the advancement of permissible statutory objectives;

WHEREAS, ORANGE - ULSTER BOCES engaged Hill International ("Hill") to undertake a study of which a copy is on file with ORANGE - ULSTER BOCES of whether the use of a Project Labor Agreement will best serve ORANGE - ULSTER BOCES 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, the Hill Due Diligence Assessment of the Impacts and Implementation of a Project Labor Agreement, (the "Study"), concluded that use of a Project Labor Agreement would provide ORANGE - ULSTER BOCES with measurable economic benefits and would promote ORANGE - ULSTER BOCES interest in obtaining the best work at the lowest prices as well as preventing favoritism, fraud and corruption; and

WHEREAS, ORANGE - ULSTER BOCES has carefully reviewed and considered the Study and determined, among other things, that ORANGE - ULSTER BOCES interest in obtaining the best work at the lowest possible price, preventing favoritism, fraud and corruption, preventing the impact of delay owing to labor unrest, obtaining cost savings advantages, 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 apply;
- (6) providing comprehensive and standardized mechanisms for the settlement of work disputes, including those relating to jurisdiction;

- (7) promoting work opportunities for those within ORANGE ULSTER COUNTIES and surrounding areas.
- (8) ensuring a reliable source of skilled and experienced labor;
- (9) promoting and creating work opportunities on this project for former and future ORANGE ULSTER BOCES graduates.

WHEREAS, ORANGE - ULSTER BOCES, has, through independent investigation and analysis, determined the likelihood of substantial cost savings to the Project will result from the application of this Agreement; and

WHEREAS, 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 others; and

WHEREAS, the Parties desire to maximize project safety conditions for both workers and others;

NOW, THEREFORE, the Parties enter into this Agreement:

I. ARTICLE 1 - PARTIES TO THE AGREEMENT

SECTION 1.1 PARTIES TO THE AGREEMENT

This is a Project Labor Agreement ("Agreement") entered into for all Project construction, as defined herein, as part of the ORANGE - ULSTER BOCES CAPITAL IMPROVEMENT PROJECTS (as defined below) between (1) ORANGE - ULSTER BOCES (2) the Palumbo Group as Construction Managers (3) Hudson Valley Building and Construction Trades Council ("Council") on behalf of itself and its affiliated Local Unions ("Local Unions"); and the signatory Local Unions on behalf of themselves and their members.

II. ARTICLE 2 - GENERAL CONDITIONS SECTION

SECTION 2.1 DEFINITIONS

Throughout this Agreement:

- (A) "Contractor(s)" means any contractor and subcontractors of whatever tier engaged in Project Work within the scope of this Agreement as defined in Article 3, subject to exclusions defined in Section 3.3; 20.3 and 20.4.
- (B) "Council" means the Hudson Valley Building & Construction Trades Council, AFL-CIO.
- (C) "Local Union(s)" means the Local Unions signatory to this Agreement, individually

and collectively.

- (D)"Owner" means ORANGE ULSTER BOCES.
- (E) "Owner's Representative" means any Construction Manager or other individual or entity designated by the Owner to enter into this Agreement or otherwise act on its behalf.
- (F) "The Project" means the work to be performed in connection with all construction associated with the ORANGE ULSTER BOCES CAPITAL IMPROVEMENT PROJECTS as more fully set forth in Article 3, Section 3.1, subject to exclusions defined in Sections 3.3, 20.3 and 20.4.
- (G)"Project Work" means the work covered by this Agreement and fully defined in Article 3, Section 3.1, subject to exclusions defined in Section 3.3; 20.3 and 20.4.
- (H)"Schedule A" means and refers to collective bargaining agreements of affiliated Local Unions.
- (I) "Union Parties" and "Unions" means the Hudson Valley Building & Construction Trades Council, AFL-CIO and the signatory Local Unions to this Agreement, individually and collectively.

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 NABTU; (4) the Agreement is authorized by the Owner and signed by the Owner or 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, subject to exceptions in Sections 3.3, 20.3 and 20.4. 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 bound by this Agreement with respect to that subcontracted Project 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 except that, 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 (the "National Agreements"), those National Agreements shall apply, except that when Contractor is also a signatory to an agreement listed in Schedule A hereof, Articles 7, 9, and 10 of this Agreement shall prevail over the applicable National Agreement and any Schedule A agreement. Where a subject covered by the provisions of this Agreement is also covered by a Schedule A agreement, 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 (unless otherwise excepted under this Agreement) become bound by 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 otherwise excepted under this Agreement. 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 ProjectWork.

III. 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 all construction associated with the ORANGE - ULSTER BOCES CAPITAL IMPROVEMENT PROJECTS in various locations listed below. Project Work, unless otherwise excepted under Sections 3.3, 20.3 or 20.4, shall include all sitework, utilities, demolition, environmental work, MEP's and all construction related to the ORANGE - ULSTER BOCES CAPITAL IMPROVEMENT PROJECTS, but not limited to the following:

Arden Hill Campus – Regional Education Center (Main Building) – Interior Alterations to Third Floor

This project is a renovation of the currently unoccupied third floor of the OUB Regional Education Center (Main Building) at Arden Hill for BOCES educational and administrative programs. Renovations include framing, finishes, doors, and related accessories for creation of new classrooms spaces and support spaces in the area of renovation. Fully renovated mechanical, electrical and plumbing systems will be installed throughout renovated areas.

Arden Hill Campus – Regional Education Center (Main Building) – Additions & Alterations to North Wing

This project is a renovation to the existing North Wing of the OUB Regional Education Center (Main Building) at Arden Hill. This two-story portion of the building is currently unoccupied. Renovations and infrastructure upgrades will include renovation of both stories of the North Wing for use by BOCES educational and administrative programs. Renovations include framing, finishes, doors, and related accessories for creation of new classroom spaces and support spaces. Exterior renovations include masonry repointing, roof replacement and replacement of all exterior doors and windows. Fully renovated HVAC, electrical and plumbing systems will be installed throughout the renovated areas. A new exterior "Learning Stair" addition will be constructed that will be utilized for outdoor education purposes. Site improvements at the exterior of the building include renovations to the plaza area and new sidewalks for ADA accessibility.

Arden Hill Campus - Site Preparation and Demolition of Buildings 2 and 3

At the OUBOCES Arden Hill Campus, this project involves demolition of Building 2 and Building 3 with associated sitework preparations, in advance of a future proposed Gymnasium Addition to the Arden Hill Regional Education Center Main Building. The future Additions and Alterations Project will involve a New Gymnasium Addition and Site Improvements including grass play fields, hardscape play areas, parking areas, driveways and walkways. See related project "Arden Hill Campus Regional Education Center (Main Building) – Additions and Alterations.

Arden Hill Campus – Regional Education Center (Main Building) – Additions & Alterations

This project involves a new Gymnasium Addition (Gymnasium, Multi-Purpose Room, Support Spaces) to the Existing Regional Education Center (Main Building). Additional work includes full roof replacement and window replacement to the Main Building. Site Improvements include grass and hardscape play areas, parking areas, driveways, walkways, landscaping, and utilities.

Arden Hill Campus – Additions and Alterations to Building 1

This project involves additions and alterations to existing unoccupied Building 1 at the Arden Hill Campus. Renovation work includes a full gut renovation of the building including framing, finishes, doors, and related accessories for creation of new administrative office spaces and support spaces. Exterior renovations include masonry repointing, siding replacement, roof replacement and replacement of all exterior doors and windows. Fully renovated HVAC, electrical and plumbing systems will be installed throughout the renovated areas. A new small Main Entrance addition will be constructed to house an ADA lift for access to both floor levels. Site improvements at the exterior

of the building include new sidewalks, parking, landscaping and utilities.

Gibson Road Campus - Additions and Alterations to Axelrod

This project is an addition and renovation to the existing Axelrod Special Education School Building located at the Gibson Road Campus. Renovation work includes renovations to classroom spaces, toilet rooms, corridors, stairways, Auditorium and Cafeteria. Additional work includes full roof replacement and exterior door and window replacement throughout. Upgrades to HVAC, electrical and plumbing systems will be provided throughout the interior renovated areas. A new Main Entrance Addition will be constructed with a Lobby, Security Vestibule, Main Office suite and exterior canopy. Site improvements include renovations to the front plaza, sidewalks and paving.

Gibson Road Campus – Additions and Alterations to Career and Tech Building (CTEC)

This project involves additions and renovations to the existing Career and Technical Institute Building (CTEC) at the Gibson Road Campus. Renovation work includes renovations to general classroom spaces and other specialty classrooms spaces (shops, labs, etc.). Renvoations will also occur at the ktichesn, toilet rooms, corridors, and stairways. Additional work includes full roof replacement and exterior door and window replacement throughout. Upgrades to HVAC, electrical and plumbing systems will be provided throughout the interior renovated areas. The existing 400 Building will be demolished. A new security vestibule addition will be provided at the Main Entrance. Two additional building additions will create additional classroom spaces and a multipurpose room. Site improvements include sidewalks, driveways, landscaping, utilities, and other paving.

SECTION 3.2 TIME LIMITATIONS

- A. To be covered by this Agreement, Project Work must be awarded after the effective date of this Agreement.
- B. This Agreement shall expire upon completion and acceptance by the Owner of the Project.
- C. This Agreement may be extended by written mutual agreement of the parties.

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 except for any local deliveries of materials such as fill, construction debris removal, ready mix, asphalt, concrete and other aggregates which shall be covered under this Agreement.
- D. Employees of the Construction Manager, except that performing manual, onsite construction labor who will be covered by this Agreement.
- E. Employees engaged in onsite 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.

IV. 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 County property.
- C. No more than twelve and a half (12.5%) 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 twelve and a half (12.5%) 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) (5) 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 Project Work 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, then 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 Project Work. Those hired through this provision shall be laid off before those of an affiliated Union.

E. Notwithstanding the foregoing, ORANGE - ULSTER BOCES or a representative of, shall have the sole discretion to request that a person be removed from working on this Project.

SECTION 4.3 NON-DISCRIMINATION IN REFERRALS

A. 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 each 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 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 in relation to employees of such Contractors performing Project Work.

V. 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 only during times when Project Work is being conducted.

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 Construction Manager 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 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.
- C. Requirements for stewards or lead engineer shall be as per the applicable Schedule A agreement.
- D. Where multiple projects or more than one general contractor is performing work at the same time, the construction manager may employ the laborer steward or another craft steward.

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 agreement, such provisions shall be recognized to the extent the Steward or Lead Engineer possesses the necessary qualifications to perform the Project 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

- A. 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.
- B. ORANGE ULSTER BOCES, 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, except those materials included m Section 3.3, when not covered under New York State Labor Law 220.
- C. While the scope of the Agreement is limited to Project Work as defined and subject to exceptions herein, 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.
- D. This Section does not refer to construction material normally purchased preassembled or manufactured, it references Project Work normally and historically done on-site or in Local Union fabrications shops.
- E. If any dispute should arise with respect to this Section, the Contractors 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.

VI. 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 Project 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 Project Work; the promulgation of reasonable Project Work rules; and the requirement, timing and number of employees to be utilized for overtime Project Work. Nothing contained herein shall be construed so as to allow direction of an Employee to perform Project 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

A. 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 Project 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.

VII. ARTICLE 7 - WORK STOPPAGES AND LOCKOUTS SECTION

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 Local 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 employee(s) 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)(2) 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. 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 Owner) 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)(2) 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 stopwork order with respect to the Project Work involved and reassign the Project 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.

VIII. ARTICLE 8 - LABOR MANAGEMENT COMMITTEE

SECTION 8.1 SUBJECTS

The Project Labor Management Committee ("Committee") will meet as established by the Committee 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; 5) review Affirmative Action and equal employment opportunity matters pertaining to the Project, if any and increase work opportunity within the County for County residents, and former or future ORANGE - ULSTER BOCES graduates.

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 Project 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 or General Contractor shall be advised in advance of such conferences and may participate if they wish. This pre-job conference with the Council is in addition to any pre-job/pre-construction conferences required by the Project Contract Documents.
- B. The purpose of the pre-job conference with the Council 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 with the Council required by this Section, each Contractor shall fill out the attached Schedule E- 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 Project 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 within three (3) days of the submission of the Proposed Trade Assignments 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 objection position in writing, together with support documentation, within seven (7) calendar days of the submission of the Proposed Trade Assignments to the Contractor or Subcontractor with a copy to all affected Local Unions. Failure of any objecting Local Union and/or other affected Unions to timely object or submit such objection positions in writing waives any objection to the Proposed Trade Assignments. The Contractor or Subcontractor will review all submitted supporting documentation regarding the Proposed Trade Assignments and will submit to the Construction Manager, 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 for Settlement of Jurisdictional Dispute in the Construction Industry established by the Building and Construction Trades Department, incorporated by reference in Schedule D, 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) Contractor's failure to conduct a pre-job conference with the Council, failure to include all required parties in a pre-job conference with the Council, or failure to adhere to agreed-upon Schedule E 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.

IX. 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 of Section 7.1, and Section 8.3(D)(2)), 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 Project Work site representative of the involved Contractor and the Construction Manager. To be timely, such notice must be in writing given within 7 calendar days after the act, occurrence or event giving rise to the grievance. Strict compliance with this 7-day notice is a condition precedent to proceeding with

such grievance. The Local Union representative or the job steward shall meet with the Project Work site representative of the involved Contractor and the Construction Manager 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 Construction Manager, within twentyfour (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 Construction Manager, 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 Construction Manager) along with copies of the minutes from Step 1 and Step 2, to the acting Arbitrator under this procedure alternating between J. Pierson, Roger Moyer and Thomas Hines. 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 Construction Manager, 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.

X. ARTICLE 10 - JURISDICTIONAL DISPUTES

SECTION 10.1 ASSIGNMENT

The assignment of Project Work shall be solely the responsibility of the Contractor performing the Project Work involved, subject to the pre-job conference with the Council and the procedures set forth in Section 8.3(C), and such Project Work assignments shall be in accordance with the National Plan for the Settlement of Jurisdictional Disputes in the Construction Industry ("National Plan"), incorporated by reference into Schedule D, 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 Project Work shall continue uninterrupted and as assigned by each 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 Project Work belongs. The deciding person or group hereunder shall have no authority to (a) assign Project Work to a double crew, that is, to more employees than the minimum required by the Contractor to perform the Project Work involved; (b) assign work to employees who are not qualified to perform the work involved; or (c) assign Project 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.

XI. 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 the applicable Schedule A agreement, 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 which are 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 1 1.2(A):

(1) Contractors who designate employees pursuant to Article 4 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 40l(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 each 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 the applicable Schedule A agreement, if the Contractor does not have an apprentice training program approved by the Department of Labor (However, all Contractors with contracts for this Project in excess of \$500,000 must participate in apprenticeship training programs pursuant to New York State Labor Law §222(2)(e)). 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 the applicable Schedule A agreement shall be responsible for and guarantee employee benefit/supplement payments and shall indemnify and hold harmless the jointly trusteed funds designated in the applicable Schedule A agreement 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 Project Work done 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 Construction Manager within 120 hours excluding weekends whenever a Contractor or Subcontractor fails to make a required benefit payment and such delinquency remain 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 Construction Manager within that 120-hour period 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 Construction Manager shall have no other obligation with respect to contributions owed by any Contractor (or its Subcontractor); but that each Contractor shall continue to be obligated with respect to contributions based on Project Work done by that respective 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.

XII. 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 plus½ 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 may be 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. This minimum 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 Construction Manager and 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 applicable Schedule A agreement 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 Agreement.

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 trade, for example if a trade's 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 and holidays which occur on a Saturday shall be observed on the previous Friday.

- B. Payment-Regular holiday pay, if any, for work performed on a recognized holiday shall be in accordance with the applicable Schedule A agreement. 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 in relation to holiday pay and benefits.

SECTION 12.5 REPORTING PAY

- A. When on a five-day work week, employees who report to the work location pursuant to a regular schedule and who are not provided with work for whatever reason, shall receive two (2) hours reporting pay, four (4) hours if work starts and eight (8) hours pay if work occurs after the 4th hour except in the case of inclement weather in which hours worked after the four hours shall be paid and when on a four-day work week with a 10-hour day, (3), (4), (5) and (10) shall apply as per the same terms above.
- 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 two (2) hours 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 agreement 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 Project Work, suffers a work-related injury or disability while performing Project 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 Project Work available 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 Project Work, employees shall be paid for "stand- by" time at their hourly rate of pay.

XIII. 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 Project 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 agreement 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 the applicable Schedule A agreement), unless the applicable Schedule A agreement 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 agreement.

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.

SECTION 13.3 NEW YORK 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 "New York 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, SDVOB, LABOR SURPLUS AREA)

- A. ORANGE ULSTER BOCES, Construction Manager, Contractors, the Hudson Valley Building and Construction Trades Council and its affiliated Unions are committed to meeting federal and New York State Participation Goals, if any are applicable to the Project, and shall be in alignment with the current goals or standards set for by federal or New York State requirements for Minority Business Enterprises (MBE), Woman Owned Business Enterprise (WBE), Service-Disabled Veteran Owned Business (SVDOB), and federal Labor Surplus Area requirements, to ensure participation on the project by MBE, WBE and SVDOB firms and job-seekers from federal Labor Surplus Areas (for 2022, City of Middletown, Town of Monroe, and City of Newburgh) while maintaining fiscal responsibility.
- B. Outreach by the Construction Manager, Contractors, Hudson Valley Building and Construction Trades and affiliated Unions and contractor associations to ensure

participation goals of NYS Certified MBE, WBE and SDVOB firms and Labor Surplus Area recruitment are met will be required through the project.

XIV. 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 all genders.

XV. ARTICLE 15 - GENERAL TERMS SECTION 15.1 PROJECT RULES

SECTION 15.1 PROJECT RULES

- A. ORANGE ULSTER BOCES, the Construction Manager and 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 with the Council, detailed in the contract documents, approved by the President of the Council, posted at the Project site, and may be amended thereafter as necessary.
- B. Security Protocols The Construction Manager with Owner's approval and in their sole discretion, will determine security protocols for the entire Project Site. Strict compliance by all Contractors and subcontractors of all tiers and their respective personnel with security procedures, protocols, and directives issued by these entities or its delegated, is required 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 Project Work performed. Employees using these tools shall perform any of the Project 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 Project Work within the employee's jurisdiction.

SECTION 15.3 SUPERVISION

Employees or other personnel shall work under the supervision of the craft foreperson or general foreperson for the applicable hiring or subcontracting Contractor

SECTION 15.4 FULL WORKDAY

- A. Employees shall be at their Project Work area at the starting time established by the Contractor.
- B. The signatories to this Agreement reaffirm their policy of a fair day's work for a fair day's wage.

XVI. 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 Project Work at all times in a safe manner and protect themselves and the property of the Contractor 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 Project 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 Manager'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 referenced in the Contract Documents and may be distributed to Contractors for further distribution to personnel and/or posted in conspicuous places throughout the Project.

SECTION 16.3 INSPECTIONS

The Contractors, Owner, Architect/Engineer, and Construction Manager retain the right to inspect incoming shipments of equipment, apparatus, machinery, and construction materials of every kind.

XVII. ARTICLE 17 - TEMPORARY SERVICES

Temporary light, power, cooling, ventilation and other services shall only be required on the specific request of a Contractor and when requested shall be assigned in accordance with the Contract Documents. Temporary coverage may be provided by the supplying Contractor's employees already working under this Agreement during regular work hours. The supplying 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 Contractor responsible for supplying the temporary light and power panels. Coverage requirements 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.

XVIII. 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.

XIX. ARTICLE 19 - FUTURE CHANGES IN SCHEDULE A AREA CONTRACTS

SECTION 19.1 CHANGES TO AREA CONTRACTS

Each Schedule A agreement incorporated by reference into this Agreement by Schedule A 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 applicable Schedule A agreement, notify the Owner and Construction Manager in writing of the agreed upon changes in the Schedule A agreement which is 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.

XX. ARTICLE 20 - PROJECT SPECIFIC

SECTION 20.1 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 subcontractors working on this Project agree to be bound by the Collectively Bargained Workers Compensation Alternative Dispute Resolution Agreement (ADR Agreement), incorporated by reference into Schedule F to this 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.

SECTION 20.2 HUDSON VALLEY BUILDING AND CONSTRUCTION TRADES LABOR MANAGEMENT ALLIANCE

If not prohibited by law, to the parties to this Agreement, the parties agree to participate in the Hudson Valley Building and Construction Trades Labor Management Alliance.

SECTION 20.3 CLEAN UP

A clean work site results in a safe and more productive job site. All cleanup during construction shall be performed by the trade having jurisdiction for cleanup in accordance with the Project Contract Documents. The Owner will ensure a clean and safe workplace. The Owner or Construction Manager may back charge Contractors accordingly if clean up becomes unsatisfactory.

Once construction is complete and a building, section or floor is turned over to a professional cleaning company for final cleaning, including but not limited to, windows and floor prep, up to 33.3% of the Employees may be a direct employee of the cleaning company. Those direct employees shall be exempt from this Agreement.

SECTION 20.4 FURNITURE, FIXTURES AND EQUIPMENT (FFE)

Project work related to furniture, fixtures, and equipment that is free standing and requires no onsite assembly and is not fastened, mounted, anchored, hardwired or hard piped to any part of the building structure or surface by glue, screws, nails, mechanical fastener or by any other means is excluded from this agreement. Accordingly, for avoidance of doubt, all unloading, handling, assembly, installation and clean up of all furniture, fixture, and equipment which requires fastening, mounting, anchoring, hardwiring or hard piped to any part of the building structure or surface by glue, nails, screws, mechanical fasteners, wire, pipe or by other means, or requires any onsite assembly shall be included project work under this agreement.

When the owner or construction manager directs or contracts excluded work under this Section (20.4) to be performed this Agreement shall apply.

EXCLUDED WORK SHALL INCLUDE:

The installation of all data cabling and components, security/fire alarm systems, audio visual equipment including all associated "low voltage" electrical connections is excluded. It is noted that the installation of all conduits, piping or wiring within the walls, floors and ceilings is included within the work of this agreement. A pre-job meeting between the vendors, electrical contractor, construction manager and IBEW shall be scheduled prior to any work related to the excluded work above begins. Movable partitions motorized and non-motorized are also excluded.

IN WITNESS WHEREOF the parties have caused this Agreement to be executed and effective as of the day of September 2023.

FOR THE HUDSON VALLEY BUILDING AND CONSTRUCTION TRADES COUNCIL:

Ву: А.Т.

L. Todd Diorio, President

ORANGE - ULSTER BOCES:

By: Enginis Panch

Eugenia Pavek, President of Cooperative Board

FOR CONSTRUCTION MANAGER:

By:

Luis Rodriguez, President, the Palombo Group

FOR LOCAL UNIONS:

International Union of Bricklayers and Allied Craftworkers Local NO. 1:

Signed:	Title:
Email:	Phone:
International Brotherhood of Helpers District NO. 5:	f Boilermakers, Iron Ships Builders, Blacksmiths, Forgers
Signed:	Title:
Email:	
Local NO. 7: Signed:	, Tile, Marble & Terrazzo Union of New York & New Jersey Title:
Email:	
Bricklayers United Union of R	Roofers, Waterproofers and Allied Workers Local NO. 8:
Signed:	Title:
Email:	Phone:
District Council NO. 9, Intern	ational Unio. of Painters and Allied Trades, A.F.L-C.1.0:
Signed:	Title:
Email:	Phone:

Laborers International Union of N.A. Local 17:

Signed:	Title:
Email:	
International Association of S Local NO. 38:	Sheet Metal, Air, Rail and Transportation Workers (SMART)
Signed:	Title:
Email:	
International Association of H	IBAT and Frost Insulators and Allied Workers Local NO. 91:
Signed:	Title:
Email:	
International Union of Elevat	ors (IUEC) Local NO. 138:
Signed:	Title:
Email:	
O.P.C.M.I.A. Plasters Union 1	Local NO. 262:
Signed:	Title:
Email:	

North Atlantic States Regional Council of Carpenters Local NO. 279:

Signed:	Title:	
Email:	Phone:	
International Brotherhood of	Electrical Workers Local NO. 363:	
Signed:	Title:	
Email:	Phone:	
Plumbers, Steamfitters & Sen	vice Technicians Local NO. 373:	
Signed:	Title:	
Email:	Phone:	
International Association of Local NO. 417:	Bridge, Structural, Ornamental and Reinforcing Iron Wo	rkers
Signed:	Title:	
Email:	Phone:	
International Brotherhood o	Teamsters Local Union NO. 445:	
Signed:	Title:	
Email:	Phone:	

Road Sprinkler Fitters Union Local NO. 669:

Signed:	Title:	
Email:		
New York City District Carp	enters Local NO. 740 & Local NO. 2287:	
Signed:	Title:	
Email:		
United Cement Masons Loca Signed:		
Email:		
International Union of Opera	ating Engineers Local NO. 825:	
Signed:	Title:	¥
Email:	Phone:	

SECTION 008700 - WAGE AND HOUR RATES

1.1 GENERAL

- A. The following minimum wage rates, health and welfare and pension fund contributions are as determined by the Industrial Commissioner of the State of New York in accordance with the provisions of Section 220 of the Labor Law.
- B. All contractors will be bound and obligated by the Laws of New York State to ensure payment to all workers involved with the construction of the Project.

1.2 MINIMUM WAGE RATES

The "Request for Wage and Supplement Information" (PW 39) you have submitted has been accepted, and a Prevailing Rate Case Number (PRC# 2023012400 - OUB Axelrod A&A) has been assigned to the project.

To access the PDF file of your schedule, click on https://apps.labor.ny.gov/wpp/publicViewProject.do?method=showlt&id=1557971 or copy and paste into your browser

SECTION 011000 MULTIPLE CONTRACT SUMMARY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

Section include/reference:

- 1. Project information.
- 2. Work covered by Contract Documents.
- 3. Construction schedule.
- 4. Requirements and assignments for the Contract.
- 5. Owner-furnished products.
- 6. Access to site.
- 7. Coordination with occupants.
- 8. Work restrictions.

This Section includes a summary of the contract, including responsibilities for coordination and temporary facilities and controls.

The Contractor is responsible to review all Drawings and Specifications for every contract to gain a complete understanding and knowledge of the entire Project, to determine how the work of the contract is to interface with every other contract.

1.3 DEFINITIONS

Project Identification: Project consists of all labor, materials, equipment, appliances, services, and incidentals necessary for layout, installing, and performing Additions and Alterations at the Orange Ulster BOCES School as shown on the Contract Drawings and described in the Specifications.

- 1. The work consists of but is not limited to the following:
- 2. The Work will be performed at
 - a. The EMANUEL AXELROD EDUCATION CENTER Campus located at 53 Gibson Rd GOSHEN, NY, 10924
- 3. Architect Identification: The Contract Documents were prepared for the Project by Architect of Record, KG+D Architects, PC.
- 4. Construction Manager: The Palombo Group has been engaged as Construction Manager for this Project to serve as an advisor to Owner and to provide assistance in administering the Contract for Construction between Owner and Contractor, according to a separate contract between Owner and Construction Manager.
- 5. Building Code in Effect for Project: 2020 Building Code of New York State as adopted and the Energy Conservation Construction Code of New York State.
- 1.4 Comply with the following: New York State Energy Conservation Code and the building

standards of the New York State Education Department.

1.5 THE CONTRACT

The Project will be constructed under a multiple prime contracting arrangement with the Owner awarding and holding separate Contracts. The Contractor shall furnish all labor, material, tools, equipment, supervision, layout, delivery, trucking, shop drawings, submittals, closeout etc. necessary to complete the work described in the Division of Work of their respective Contracts and based upon a complete set of Contract Documents.

It is the Owner's intention to continue to occupy the existing buildings and site 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 at all times. 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.
- c. Schedule construction operations so as 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 remain operational at all times. The Contractors are responsible to maintain all systems, such as but not limited to fire alarm, clocks, electric, public address system, gas service, heat etc.
 - a. District intends to occupy all levels of the main building throughout the construction duration. Coordination is required for all movements into the bldg., shutdowns, tie-ins and any other operational affecting operations/task.

The Prime Contractor shall:

- Provide field-engineering services, in addition to those provided by the General Work Prime Contract, to install site utilities included in the applicable Prime Contract.
- 2. Coordinate construction schedule information in order to formulate one master schedule for the entire Project "Baseline". General Contract to organize, publish and update said schedule as direct by the CM, but no less than bi-monthly (twice per month).
- Coordinate weekly construction schedules and activities. Every week
 Prime is to submit to the CM and other Primes a detailed plan of
 activities in the field to include, but not be limited to work planned, crew

- size, hours of work, deliveries, coordinated activities with others, Owner requested coordination needs. Prime Contractor to take responsibility for submitting this on account for all of their vendors and subcontractors.
- 4. Provide reflective vests and other necessary PPE to be worn by all onsite personnel at all times. Parties that do not abide by this requirement will be escorted off the premises.
- Provide erosion and Sediment Control and dewatering as it relates 5. to any excavation associated with its own Prime Contract.
- 6. Provide potable drinking water for its own employees.
- 7. 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.
- 8. 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.
- 9. 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.
- 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.
- 11. 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.
- 12. Provide traffic control for deliveries, and equipment needed to perform the work of their own Prime Contract.
- 13. Provide protection of its own finished Work, after installation, until accepted by the Owner.
- 14. Provide fire caulking for any penetration related to the work for its own Prime Contract.
- 15. Provide any office and storage trailers required to complete the work of their own Prime Contract.
- 16. Provide final cleaning of all surfaces and areas within the work areas to the satisfaction of the CM.
- 17. Project closeout requirements including As-Builts, Owner's Manual, Training etc.
- 18. The Contractor shall review the facility asbestos report to become familiar with any materials that may contain asbestos. If the contractor encounters materials that have not been tested for asbestos, he shall cease work and contact the Construction Manager. The Contractor will be held responsible for clean-up costs

- if they continue to remove materials that have not been tested for asbestos.
- 19. Provide for a thorough final cleaning of the site, building, and equipment provided under their Prime Contract immediately before the final inspection, to be performed by an independent third party cleaning company. The Prime Contractor is responsible for cleaning and dust and debris generated from the work of their own Contract.
 - a. Maintain areas in a cleaned condition until the Owner occupies the space.
 - b. Personnel: Experienced workman or professional cleaners approved by the Construction Manager.

1.6 SUMMARY OF WORK

The work will be constructed under multiple prime contracts. One set of contract documents is issued covering the multiple contracts. The Prime Contract is defined as:

- 1. CONTRACT 1 GC GENERAL CONSTRUCTION WORK
- 2. CONTRACT 2 HZ HAZARDOUS MATERIAL CONSTRUCTION WORK
- 3. CONTRACT 3 RC ROOFING CONSTRUCTION WORK
- 4. CONTRACT 4 PC PLUMBING CONSTRUCTION WORK
- 5. CONTRACT 5 MC MECHANICAL CONSTRUCTION WORK
- 6. CONTRACT 6 EC ELECTRICAL CONSTRUCTION WORK

1.7 WORK UNDER SEPARATE CONTRACTS

The project will be constructed under a multiple-prime contracting arrangement.

One set of documents is issued covering all prime contracts' scope of work. The prime contractor is to review ALL drawings and specifications for complete understanding and knowledge of the work to be performed.

The following Contract Documents are specifically included and defined as integral to the Prime Contract.

- 1. Bidding Requirements
- 2. Performance and Payment Bonds
- 3. Conditions of the Contract, including
 - a. General Conditions & Supplementary Conditions
 - b. Insurance Requirements
 - c. NYS Prevailing Wage Rates
 - d. Project Labor Agreement

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.

a. Unless otherwise indicated, the Work described in this Section for the contract shall be complete systems and assemblies, including products, components, accessories, controllers/programming, and all installation

- required by the Contract Documents.
- b. Local custom and trade-union jurisdictional settlements do not control the scope of the Work of the contract. When a potential jurisdictional dispute or similar interruption of work is first identified or threatened, affected contractors shall negotiate a reasonable settlement to avoid or minimize interruption and delays.
- It is implied, unless otherwise noted, that any new work that has existing C. work in its place, the removal of the existing work is included in the scope of new work installer.
- d. All contractors are responsible for the removal and reinstallation of ceiling where work must be installed above a ceiling not scheduled for removal or out of sequence for new installation.
- The General Contractor shall provide excavation, support of excavation, e. backfilling material, restoration etc. for all scope of work.
- f. The General Contractor are responsible to provide all cutting and patching/restoration, wall and floor trenching, etc. associated with all Contracts. All patching/restoration is to be performed by mechanics qualified and experienced with the materials and finishes being patched. New openings requiring structural reinforcing will be the responsibility of the General Construction Contract. Core drilling, fireproofing etc. shall be by Prime Contractor. Layout to be performed by the Prime requiring the opening, coordinated by Prime Contractor
- Firestopping for the Work of the contract shall be provided by the g. contract for its own Work. Firestopping shall comply with Division 7 Section "Through Penetration Firestop Systems".
- h. Access doors not shown on Architectural drawings and required for access to junction boxes, valves and similar equipment for the Work of the contract shall be furnished by the contract for its own Work to the General Construction Contractor for installation.
- i. Lead Based Paint precautions for the Work of the contract shall be provided by the contract for its own Work. The Prime Contractor shall provide procedures for OSHA Lead precautions.
- j. The 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 by their Contract; 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.
- Termination and removal of its temporary facilities shall be provided k. by the contract for its own Work.
- Ι. The Electrical Contractor Shall provide temporary power and lighting at the areas of work for all trades within the building, as required for the duration on construction.

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," the Contractor is responsible for the following:
- a. 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.
- b. Generators, plug-in electric power cords and extension cords, supplementary plug- in task lighting, and special lighting necessary exclusively for its own activities.
- c. Its own field office, complete with necessary furniture, and telephone service.
- d. Its own storage and fabrication sheds.
- e. Its own dust protection to control dust where dust partition is not scheduled or shown on the drawings but are necessary to protect the building from dust contamination. General Contractor to include temp walls, zip walls, portion walls, as needed or as directed by the CM to contain dust/protection during construction. General Contractor to include 10 such walls in base bid with the width equaling the hallway and height up to drop ceiling.
- f. Temporary enclosures for its own construction activities.
- g. Hoisting requirements for its own construction activities.
- h. Staging and scaffolding for its own construction activities.
- i. Collection and disposal of its own hazardous, dangerous, unsanitary, or other harmful waste material.
- j. Daily clean-up and disposal is required by the Contractor for the periods which that Contractor is performing work on site. Dumpsters will be provided by the General Construction contract for use by the prime contractors, recycling of materials will be instituted daily. Each trade will assign at least one person to the weekly general clean-up. Any Contractor not providing personnel will be "backcharged" for labor provided by the Construction Manager. Progress cleaning of its own areas on a daily basis.
- k. Secure lockup of its own tools, materials, and equipment.
- I. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.
- m. Temporary heat, to install and protect the work, is place where scheduled temporary heat is not in place or not called for in the contract documents.
- n. Safety procedures as dictated by the district, OSHA, and the NYS Department of Labor
- 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.

Temporary Heating, Cooling, and Ventilation: The General Contractor is responsible for temporary heating, cooling, and ventilation before permanent enclosure of building is complete and/or when a system is removed or otherwise disabled. The General Construction Contract is responsible for temporary heating, cooling, and ventilation after permanent enclosure of building is complete and Owner will pay electric utility-use charges.

Temporary ventilation: The Contractor to control fumes from their own construction operations including interior panting and "off gassing" of new

finish materials.

Use Charges: Comply with the following:

- a. Water Service: Water service is available at no charge.
- Electric Power Service: Electric Power service is available at no charge. Except when power shut down to the building occurs, the EC to provide temp power to facilitate the ongoing work of other trades.

Storage: The Contractor shall coordinate with the Construction Manager for locations of on-site storage for material, employee parking, material loading/unloading etc. It is the intent of the Project to store approved delivered material on site in phases. Any storage required for material, tools, and equipment outside the summer schedule is the responsibility of the Contractor. Example locations are proposed in a Project Staging Plan. Material available and not on site will not be a basis for delay.

1.8 OWNER SUPPLIED & STATE/CO-OP CONTRACTED SCOPE

All work associated with Owner Provided Scope provided scope includes, but is not limited to, the following, providing a fully operational, code compliant, system, including stamped designs as required. This includes, but is not limited to, work shown on the following:

1. Coordination

- a. Prime Contractor shall provide Coordination of their scope of work with all other contractors, third parties, Owner activities/agents/suppliers/contractors.
- b. Prime Contractor shall become familiar with scope of all State Contractors and their support/scope coordination and interface responsibilities.

2. Public Address & Clock System

- **a.** The Electrical Contractor shall install infrastructure items, such as conduit, supports, cable/wire, terminations, identification, cable testing
- **b.** The Owner (Day Automation) shall supply final technology devices, panels, headend equipment and installation and testing for a complete system

3. Fire Alarm

- The Electrical Contractor shall install infrastructure power needs for main/sub panels
- **b.** The Electrical Contractor shall install infrastructure items, such as conduit, boxes and supports.
- **c.** The Owner (ADT) shall install infrastructure items cable/wire, identification, cable testing
- **d.** The Owner (ADT) shall supply final devices, panels, headend equipment, installation and testing for a complete system

4. Lockdown System

- **a.** The Electrical Contractor shall install infrastructure items, such as conduit, supports, cable/wire, identification, cable testing
- **b.** The Owner (Eastern Datacom) shall supply final devices, panels, headend equipment, installation and testing for a complete system

5. Security Cameras

- **a.** The Electrical Contractor shall install infrastructure items, such as conduit, supports, cable/wire, identification, cable testing
- **b.** The Owner (Day Automation) shall supply final devices, panels, headend equipment, installation and testing for a complete system

6. Classroom Smart Boards

- **a.** The Electrical Contractor shall install infrastructure items, such as conduit, supports, cable/wire, terminations, identification, testing
- **b.** The Owner (School District) shall supply final devices, panels, headend equipment, installation and testing for a complete system

7. Phones

- **a.** The Electrical Contractor shall install infrastructure items, such as conduit, supports, cable/wire, terminations, identification, cable testing
- **b.** The Owner (School District) shall supply final technology devices, panels, headend equipment and installation and testing for a complete system

8. Building Management System Controls

- a. The Electrical Contractor shall install infrastructure power needs for main/sub control panels as they are needed
- b. The Owner (Trane) shall furnish and install Spec Section 23 0900 and 23 0993. There are some various components within these specifications provided by Trane and installed by the Mechanical Contractor. Trane's proposal has been included via an Addendum to this section for inclusions/incorporation as to what will be provided by whom. In the absence of Trane's inclusion, the scope shall be the responsibility of the Mechanical Contractor.
- c. The Mechanical Contractor shall coordinate with BMS provider on access, coordination drawings, submittals, infrastructure requirements, installation schedule, to ensure all required points are maintained for control.

9. Mechanical Equipment

- a. The Electrical Contractor shall install infrastructure power needs for mechanical equipment
- b. The Mechanical Contractor shall install Owner provided material per Trane's proposal has been included via an Addendum to this section for inclusions/incorporation as to what will be provided by whom.
- d. The Owner (Trane) shall furnish the equipment in the following specification sections. Mechanical Contractor shall take delivery of material and store on site upon its delivery. Coordinate with storage as required to maintain schedule and install equipment the specifications and manufacture requirements
 - i. 237223.19 PACKAGED INDOOR FIXED PLATE ENERGY RECOVERY UNITS
 - ii. 237223.29 PACKAGED OUTDOOR FIXED PLATE ENERGY RECOVERY UNITS
 - iii. 237416.11 PACKAGED, SMALL-CAPACITY, ROOFTOP AIR-CONDITIONING UNITS
 - iv. 237416.13 PACKAGED, LARGE-CAPACITY, ROOFTOP AIR-CONDITIONING UNITS
 - v. 238126 SPLIT-SYSTEM AIR CONDITIONERS
 - vi. 238129 VARIABL REFRIGERANT FLOW HVAC SYSTEMS

i. 238216 HYDRONIC AIR COILSii. 238219 FAN COIL UNITSiii. 238223 UNIT VENTILATORS

10. Access Control

- **a.** The General Contractor shall provide and install doors, frames, glazing, accessories, trim, saddles etc.
- **b.** The Electrical Contractor shall install infrastructure items, such as conduit, supports, cable/wire, terminations, identification, cable testing for access readers
- **c.** The Owner (Day Automation & Kelley Bros.) shall provide all hardware sets
- **d.** The General Contract shall install all Owner provided hardware sets
- **e.** The Owner (Day Automation) shall supply final technology devices, panels, headend equipment and installation and testing for a complete system

11. Classroom Furniture

a. The Owner (School District) shall provide and install all furniture

12. Bathroom Accessories

 The Owner (School District) shall provide paper towel dispenser, soap dispenser, toilet paper dispensers for the General Contractor to install.

1.9 GENERAL CONSTRUCTION CONTRACT

Work in the General Construction Contract includes Architectural, Structural, Masonry, Roofing, Finishes, Blocking for Equipment, Sitework, plus other construction operations traditionally recognized as General Work Construction. This includes, but is not limited to, work shown on the following:

- a. Drawings:
- a. All "title sheets, general notes, code compliance and Phasing Drawings" (General)
- b. All "CC" series Drawings (Code Compliance)
- c. All "S" series Drawings (Structural)
- d. All "C" series Drawings (Civil)
- e. All "L" series Drawings (Landscaping)
- f. All "A" series Drawings (Architectural)
- g. All "G" "GEN", Drawings, as it pertains to Work of this Contract
- h. Applicable information as shown on the "AA" "M" "P" "FA" "E" drawings, unless noted otherwise. It also includes Administrative and coordination responsibilities.
- i. All reference to other drawings from all other drawing listed above
- b. Coordination:
 - a. Coordination with their work with all of the other contractors.
 - b. Coordinate with Owner Supplied State Contract scope of work, see section for details
- c. Demolition:
- a. Removal of any all exterior sitework, including but not

- limited to concrete, railings, fence, foundations, slabs, curbs, stairs, bituminous paving, asphalt, pavers, footings and sidewalks as shown or described as it relates to the scope shown or required to install new work to the exterior of the building.
- b. Removal of all underground utilities and/or equipment as shown or described as it relates to the scope shown.
- c. Provide and install shoring bracing, underpinning, sloping/benching as related to the exterior site work; provide for excavation and structural backfill for footing, foundations, trenches and ground openings.
- d. Provide and install shoring, bracing, supports needed for the installation/opening for new work, to include, but not limited to the roof deck, walls, concrete slabs between floors, and other openings/removals.
- e. Selective/miscellaneous demolition after a cleared work area, as needed for new install.
- f. Removal of all interior finishes, including but not limited to ceilings, walls, floors, doors/frames, windows, casework, seating, structures, railings, fence, slabs, as shown or described as it relates to the scope shown or required to install new work to the interior of the building. Floors, walls and ceilings needed to be "trenched" or removed for finishes or in set utilities will be removed and replaced/restored by the General Contractor. Remove material not called out in demolition on the roof/fascia or of containing hazardous material.

d. Temporary Facilities

- a. Temporary facilities and controls that are not otherwise specifically assigned to the Mechanical Contract or Electrical Contract.
- b. Provide and maintain dust protection and temporary 4' high orange fencing around work areas. The site shall be protected from any open excavations in accordance with OSHA guidelines.
- c. Sediment and erosion control. Provide wash out area for concrete& construction vehicles as required
- d. Storm water control.
- e. Unpiped temporary toilet fixtures, wash facilities, and drinking water facilities, including disposable supplies at each facility for the duration of the project
- f. Dewatering facilities and drains.
- g. Excavation support and protection
- h. Special or unusual hoisting requirements for construction activities, including hoisting loads in excess of 2 tons, hoisting material or equipment into spaces below grade, and hoisting requirements outside building enclosure.
- i. Project identification and temporary signs for construction
- j. General waste disposal facilities including dumpsters for the project duration at each school for <u>all</u> trades. Specific Contractors

- to also carry general waste of their specific removed/demolished articles of work.
- k. Pest control.
- I. Temporary stairs.
- m. Temporary fire-protection equipment.
- n. Barricades, warning signs, and lights.
- o. Site enclosure fence as shown or directed in the field
- p. Covered walkways as shown
- q. Security enclosure and lockup.
- r. Environmental protection.
- s. Dust mitigation/containment and control measures i.e. "zip walls", plastic may need to be required in classrooms, hallways, office, to protect unmoved equipment, furniture, finishes, as required and as directed.
- t. Restoration of Owner's existing facilities used as temporary facilities.
- u. Site restoration, topsoil seed and straw for damaged lawns due to temporary storage units
- v. Provide dust protection and temporary site/security fencing, reference phasing and logistics plan
- w. Provide temporary roads/ access and continuous exits in and out of the construction area as shown. Provide stone entry pad at staging yard. Repair back to natural state when complete. Provide work as shown on the phasing and logistics plan.
- x. Provide temporary access and continuous exits in and out of all construction areas
- y. Provide frost protection during excavation; protect concrete slab and masonry from cold temperatures during and after pour.
- z. Protect exterior wall and interior spaces when performing tie in work for new addition and any type of window wall replacements.
- aa. Provide all temporary partitions, egress doors, and temporary egress parameters indicated by the CM inside and outside the building. Restore all areas to original condition upon completion. Review Logistics and Phasing Plans.
- bb. Provide Temporary Facilities indicated as Work of this Contract in Division 1 Section 01 5000, "Temporary Facilities and Controls"
- cc. Provide all temporary fall protection, guardrails, handrails, slab and roof openings protection, temporary stairs and ramps as required. Include maintaining these items throughout the project as well as removal when no longer needed.
- dd. Provide Temporary storage for salvaged materials as indicated on the drawings until reinstallation of such materials.
- e. New Construction:
 - a. This Contractor shall be responsible for the construction of all exterior site work, including but not limited to all concrete/asphalt sidewalks, precast/stone/cast curbs, stairs/steps/landings/ramps,

- prep, finish, reinforcement/pins, railing, subgrade/base, drainage systems etc. asphalt, striping, fencing, guardrails, as per details shown
- b. The General Construction Work Contract shall perform all necessary trenching and excavation, backfilling, and compaction and field restoration required for all other primes. Include setting of precast material provided by other primes.
- c. Earthwork
 - GENERAL: All earthwork shall be confined to the construction area as shown on the plans, and shall be done in an approved manner with proper equipment. Earthwork shall be suspended during rain and inclement weather, or when unsatisfactory field conditions are encountered, unless otherwise directed by the AE and CM. At all times during construction, the CONTRACTOR shall maintain proper drainage in the construction area and shall take all measures necessary for erosion and sediment control.
 - 2. Existing Utilities: CONTRACTOR shall take every precaution to protect existing utility services from damage during construction operations. If damage occurs, the OWNER of the utility shall be notified immediately, and repairs shall be made promptly at the CONTRACTOR'S expense. All repair work shall be satisfactory to the AE and CM and the OWNER of the utility. When interruptions of existing utilities occur, temporary service shall be provided as approved by the AE and CM and OWNER of the utility.
- d. Dressing Off: All cuts, fills and slopes shall be neatly dressed off to the required grade or subgrade, as indicated on the plans.
 - Cleanup: Cleanup of the site shall be made upon completion of grading work or any major part thereof. Unless otherwise noted, excess or surplus material shall be wasted and dressed off on the site, or adjacent thereto, to the AE and CM'S satisfaction. Excess or surplus material wasted in off- site spoil areas shall be spread and leveled as directed.
 - 2. Topsoil Placement: Topsoil shall consist of a natural friable loam, occurring usually in a surface layer 6 to 18 inches thick, and free of roots, grass, weeds, stone and other foreign matter. Topsoil may be obtained from the graded area, if available, and stockpiled for future use. Otherwise, the CONTRACTOR shall provide topsoil from other sources at his own expense. All topsoil shall be acceptable to the AE and CM. Topsoil shall be placed on the entire graded area as shown on the plans, or as directed by the AE and CM. Topsoil shall be distributed to a depth of 4

inches, measured loose, and dressed off neatly to finish grade, with all debris removed. Topsoil shall receive final dressing of seed and mulch or straw and watered until germination.

- e. Provide temporary driveway, parking lot paving and drainage as required.
- f. Areas modified for construction/staging/etc. to be placed back to its natural state once construction is complete by this trade.
- g. Provide all site signage as requested by the CM. Example; Gates, Hard hat area, No smoking, Construction personnel only, Exit signs, Etc.
- h. Provide underground storm water distribution systems as shown or called out for a complete system, including catch basins, pipe, underdrains, infiltrators, fabric, stone, testing, inspection ports, excavation, backfill restoration act.
- i. Furnish and Install fence systems, wind/privacy screens
- Furnish and Install all landscape including but not limited to, plantings, mulch, topsoil, specialty substrate, pavers, curbs, benching, seating, accessories, sod,
- k. Provide all structural elements for a complete system, including but not limited to survey, subgrade, drainage, compaction, insulation, moisture protection, reinforcement, hardware, welding as necessary, concrete, vapor barriers, steel, finish, act. Coordinate with PC and EC on utility stub ups.
- The General Construction Contract is to provide rough opening in walls, floors, and roofs both inside and out, including lintels and any required structural framing for penetrations as part of this Contract. All lintels and/or framing are to be sized per the Architect.
- m. Provide all associated lintels at new or old openings as shown. Coordinate with mechanical trades. Removal and replacement of ceilings as required to perform work by this trade.
- n. Provide and install interior construction finishes, including partitions, doors-frames-hardware, thresholds, sills, signage, storefront doors/windows/panels, pass through windows, interior glazed openings, and fittings and all work required to install select work. Provide all steel required at new openings, coordinate with all Prime contracts. Power for electrified hardware to be provided to the door by the Electrical Contractor.
- Provide and install all interior finishes, including but limited, to rough carpentry finish carpentry, ceilings, architectural woodwork, filler panels, casework, countertops, blocking. Salvage and re-install work as applicable.
- p. Provide repairs to masonry and concrete structures and openings. Include all ties, accessories, cleaning, prep, and washing for finished system. Patch to match exterior and interior finishes

- including work from other trades. Provide masonry walls including reinforcement, inserts, expansion joints, infills, veneer, anchors, drainage, weeps, insulation, flashing, lintels act for a complete system as detailed
- q. Provide and install sitework restoration on disturbed areas, regardless of cause during construction of, asphalt, concrete, curb, topsoil, seed act.
- r. Provide and install thermal and moisture protection as required
- s. Provide and install Purple (moisture resistant) gypsum wallboard in all wet areas and finishing for same.
- t. Provide and install finishes and subfloor prep requirements, including but limited, polished concrete, terrazzo, tile flooring, resilient vinyl tile, ceramic tile. carpeting, base cove, painting, high performance coatings, grout, caulk, setting material, suspended acoustical and gypsum walls/ceilings, chassis ways/walls, grid/track/studs, insulation, spray vapor barrier, plastic vapor barrier. Provide self-leveling underlayment and/or other surface prep as required by manufacturer to allow for acceptable flooring installation. Patch existing floor penetrations for installation of new work. This includes any moisture mitigation requirement by the flooring manufacturer due to site conditions. Removable wall covering, equipment, displays accessories act to be removed prior to painting walls and reinstall upon completion.
- Include surface prep as required by the product manufacturer.
 Remove and re-install obstructions as needed for finish work installation.
- v. Provide all building signage, fire-protection specialties, visual display boards, whiteboards, smartboards/TVs, corkboards/tackboards.
- w. Provide temporary hard protection over finished products. Include maintenance and removal of protection. Contractor shall anticipate that all existing areas to receive new flooring shall require both light grinding and self leveling underlayment. Provide additional flash- patching where old walls were removed.
- x. Provide and install exterior facade repairs such as pointing, repointing cracks repairs, facade replacement, new lintels, lintel replacements, expansion joints, caulk. Include infills, removals, waterproofing, anchors act as detailed
- y. Mechanical Contractor to install all new mechanical equipment. Roof mounted equipment installation shall be coordinated for location and building tie-in. Curb material will be provided by the Contractor providing the equipment (Mechanical Contractor or Owner). The roofing, insulation and curb cut in shall be by the Roofing Contractor, along with all necessary, waterproofing, act. Any structural support modifications and building envelope

- penetrations will be by General Contractor.
- z. Provide and Install all misc. metals including but not limits to handrails, railings, structural steel support, supports for openings/lintels
- aa. Provide and install new/modifications to lecture type seating, acoustical panels and baffles, movable partitions, curtains, drapery
- bb. Provide and Install Window system to include, but not limited to; windows, blocking, lintel, flashing, trim, caulking, shades, sills, stickers, glazing, bug screens, painting/patching insulating etc., for a complete system both exterior and interior.
 - a. Remove window, trim, frame, glazing, caulking, glazing, shades act for a complete clean removal of the window system, prep for new work as needed for new install. Adhere to manufactures requirements for this work.
 - Window openings shall be protected, supported and weather tight during the removal and reinstallation sequence. Coordinate with Owner on sequence and durations
- cc. Provide and Install Movable Partitions system.
- dd. Provide and Install spray fireproofing, interior and exterior. Coordinate with other Primes prior to performing work.
- ee. Provide and Install concrete (Ardex) floor leveling. Coordinate with other Primes prior to performing work.
- ff. General Contractor to include structural elements up to and including the metal roof deck. Roofing Contractor to include the roof deck as their limits of transition into their scope of work. Coordinate with the Electrical and Mechanical Contractors for install support connections and reconnections act as needed for the roof replacement.
- gg. General Contractor is responsible for all interior work below the roof deck. Electrical Contractor shall support remove, rerouting, and reinstallation of wires/cables/ etc. to support this scope. For roof penetrations, the Roofing Contractor will remove existing roof to the specified limits or as required for the Structural reinforcement, up to and including the roof deck. General Contractor is responsible for all structural scope. General Contractor is responsible for the structural deck installation. Post decking, the Roofing Contractor will waterproof the opening, as shown/specified. Roofing Contractor shall replace anything that was removed because of the opening within the roof limits. General Contractor shall maintain a dry building envelope during this scheduled duration. Submit schedule and plan to A/E and CM for coordination and approval.

f. Misc. Inclusions

a. Contractor shall include prime coats, final painting, stone, brick,

ceiling tile, gypsum, plaster, chalk, grout, floor tile etc. Paint entire patched wall, corner to corner. Color/Finish to be coordinated with Owner prior to commencing. "Patch" to match existing at the following conditions

- 1. At all removed existing walls.
- 2. At all new door openings cut through existing walls.
- 3. At all new walls in existing construction.
- g. Include (furnish, and install, unless noted otherwise):
 - a. As indicated on the plans.
 - b. Provide exterior and interior equipment and housekeeping pads, structural slabs etc. including but not limited to including formwork, rebar, pins, sleeves, finishing, etc. for completion of work
 - c. Provide and install Bathroom finishes and accessories. Coordinate with Owner supplied material
 - d. Provide within the Base Bid, furnish and install additional to the contract documents, 3,500 square feet of finished sheetrock and support, paint etc. at the direction of the CM. This work shall be used for Owner requested items, bulk heads, chase-ways, infills and excessive patch areas.
 - e. Provide Professional cleaning prior to substantial completion including but not limited to, window washing, vacuuming of carpeting, and waxing of flooring. This shall be done with all trades complete. A Third Party vendor is required and must be submitted for approval. This work shall be itemized on the baseline schedule in order to maintain Owner acceptance date.
 - f. Provide and Install Misc. access for work, as directed by the AE or CM.
 - 1. Ten 18" x 18" fire-rated access doors for gypsum wallboard
 - 2. Ten 18" x 18" fire-rated access doors for masonry construction.
 - 3. Ten 8" x 8" non-rated, primed steel, trimless, access doors for gypsum wallboard construction.

The Work of the General Construction 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 particular work. This prime contract is defined as, and includes, all Sections in the Divisions indicated by reference, and specific Sections noted as well as manufacturer requirements for new work:

- 1. Division 0 Procurement and Contracting Requirements, All Sections
- 2. Division 1 General Requirements, All Sections, including Temporary Facilities
- 3. Division 2 Existing Conditions, As applicable to work of this contract
- 4. Division 3 "Concrete" All Sections
- 5. Division 4 "Masonry" All Sections

- 6. Division 5 "Metals" All Sections
- 7. Division 6 "WOOD, PLASTICS, AND COMPOSITES" All Sections
- 8. Division 7 "THERMAL AND MOISTURE PROTECTION" All Sections
- 9. Division 8 "OPENINGS" All Sections
- 10. Division 9 "FINISHES" All Sections
- 11. Division 10 "SPECIALTIES" All Sections
- 12. Division 11 "Equipment" All Sections
- 13. Division 12 "Furnishings" All Sections
- 14. Division 14 "Conveying Equipment" All Sections
- 15. Division 31 "Earth Work" All Sections
- 16. Division 32 "Exterior Improvements" All Sections
- 17. Division 33 "Utilities" All Sections

1.10 ROOFING CONSTRUCTION CONTRACT

Work in the Roofing Construction Contract includes Architectural, Structural, Masonry, Roofing, Finishes, Blocking for Equipment, plus other construction operations traditionally recognized as General Work Construction. This includes, but is not limited to, work shown on the following:

a. Drawings:

- a. All "title sheets, general notes, code compliance and Phasing Drawings" (General)
- b. All "CC" series Drawings (Code Compliance)
- c. All "A" series Drawings (Architectural)
- d. All "G" "GEN", Drawings, as it pertains to Work of this Contract
- e. Applicable information as shown on the "AA" "M" "P" "FA" "E" "L" "C" "S" drawings, unless noted otherwise. It also includes Administrative and coordination responsibilities.
- f. All reference to other drawings from all other drawing listed above

Coordination:

- a. Coordination with the work with all of the other contractors.
- Coordinate with Owner Supplied State Contract scope of work, see section for details

3. Demo:

- Remove existing roofing system including but not limited to membrane, ballast, trim, flashing, insulation, anchors, supports, etc. for a complete system replacement
- Removal and disposal of miscellaneous equipment including equipment not shown if impacting work to be demolished (i.e. skylights, EF, curbs)
- c. During removals, adjacent area protection and/or surface coverings will be required to keep cleanliness to a minimum.

4. Temp Facilities:

a. Roofing Contractor shall be responsible for temp. roof protection during periods where new roof has yet to be installed, and existing

roof has been removed. No new removals shall progress without proper watertightness has been established on removed area or planned/coordinate to progress.

5. New Work:

- a. Provide and install roofing scope as shown, including patching, coverings, flashings, roof specialties and glazed openings. The roofing shall be by the Roofing Contractor, along with all necessary supports, waterproofing, manufacturer inspection etc.
- a. Provide and Install new roof, as directed in and/or via approved Alternates, as specified. It is the intent to provide a new roofing system, per the manufacturer, with warranty as noted. Provide workmanship and material that will satisfy the requirements of the manufacturer.
- b. Provide new insulation, taper if required for slope, and other deck infill/backing. Provide all fasteners, chemically and/or mechanically
- c. Provide metal scope, including but not limited to ladders, copings, scuppers, terminations, flashing, riglets, and counterflashing, gutters/leaders etc. as shown. This includes prep work, anchors, coring, patching and tie-in to when existing is to remain and adjoin to new work.
- d. Provide and Install all rough and finish carpentry, blocking and fascia work as shown or as required per manufacturer requirement of mechanical equipment installation
- e. Provide and Install flashing, counter-flashing repair and elastomeric coatings, through wall flashing with reglet details as shown.
- f. Provide roof walkway pads up to and entirely around all roof mounted mechanical equipment per the detail shown
- g. Plumbing Contractor to tie in roof drains below deck to roof drain system.
- h. Provide expansion joints as shown.
- i. Provide thermal and moisture protection.
- j. Provide Warranty Training on new system.
- k. Where new work abuts existing work, care shall be taken to seem the work together keeping a watertight connection and aesthetics acceptable to the Architect and Manufacture.
- Provide and install closure to skylights including curbs. Contractor to waterproof system into new roofing system as required by the roofing manufacturer.
- m. All roofing work in accordance with new roofing application/manufacturer. If details are different than those shown in the project documents, follow details provided by the manufacturer.
- n. Coordinate with Mechanical Electrical Contractor for support of systems as required to install the specified roofing system. Including but not limited to conduit, lights, solar systems, PA/Speakers, security, weather stations, radio systems lightening protection, exhaust fans, electricalmechanical-plumbing stubs, RTUs, AHUS, condensers etc. Mechanical and Electrical Contractor to provide supports for all new work. Coordinate with Mechanical and Electrical Contractor for any watertight requirements of the supports.
 - Mechanical Contractor to install all new mechanical equipment. Roof mounted equipment installation shall be coordinated for location and building tie-in. Curb material will be provided by the Contractor

providing the equipment (Mechanical Contractor or Owner). The roofing, insulation and curb cut in shall be by the Roofing Contractor, along with all necessary, waterproofing, etc. Any structural support modifications and building envelope penetrations will be by General Contractor.

o. Provide and install all gutters, downspouts, supports and site drainage for a complete system

The Contractor is directed to examine all drawings since certain details and/or notes may appear anywhere therein that apply to his/her particular work. This prime contract is defined as, and includes, all Sections in the Divisions indicated by reference, and specific Sections noted:

- 1. Division 0 Procurement and Contracting Requirements, All Sections
- 2. Division 1 General Requirements, All Sections, including Temporary Facilities
- 3. Division 2 Existing Conditions As applicable to work of this contract
- 4. Division 3 Concrete As applicable to work of this contract
- 5. Division 4 Masonry As applicable to work of this contract
- 6. Division 5 Metals As applicable to work of this contract
- 7. Division 6 WOOD, PLASTICS, AND COMPOSITES As applicable to work of this contract
- 8. Division 7
 - Section 07 8410 Penetration Firestopping, as required for the Work of this Contract
 - b. Sections 07 5323, 07 7200, 07 6200 are exclusively apart of the Contractors scope of work

1.11 ELECTRICAL CONTRACT

Work of the Electrical Contract includes a complete working system for system such as Electrical Distribution Service, Lighting, CATV systems, Communications, Fire Alarm, Intercom Systems, Security Systems, Emergency Lighting, and other systems traditionally recognized as Electrical work. This includes, but is not limited to, work shown on the following:

1. Drawings:

- All "title sheets, general notes, code compliance and Phasing Drawings" (General)
- b. All "CC" series Drawings (Code Compliance)
- c. All "FA" series Drawings (Fire Alarm)
- d. All "E" series Drawings (Electrical)
- e. All "G" "GEN", Drawings, as it pertains to Work of this Contract
- f. Applicable information as shown on the "AA" "M" "P" "S" "C" "L" "A" drawings, unless noted otherwise. It also includes Administrative and coordination responsibilities.
- g. All reference to other drawings from all other drawing listed above

Coordination:

- a. Coordination with the work with all of the other contractors.
- Coordinate with Owner Supplied State Contract scope of work, see section for details

3. Demolition

a. Coordinate with the General, Plumbing and Mechanical Contractors for necessary shutdowns and disconnects. Remove and reinstall equipment, obstructions, etc. as required for the installation of new work required by other Prime's scope.

4. Temporary Facilities

- a. Provide Temporary Facilities indicated as Work of this Contract in Division 1 Section 01 5000, "Temporary Facilities and Controls"
- b. Provide temporary lighting applicable to OSHA requirements until permanent lighting is established for the duration of the project.
- c. Fire alarm devices shall be surveyed and protected during the work. Contractor shall maintain a safe and operable system during construction, up until the new system us operational.

5. Construction:

- a. Selective/miscellaneous demolition after a cleared work area, as needed for new install.
- b. Selective demolition in a safe and approved manner (LOTO)
- c. Provide and install panels, conduit, wire, enclosures, junction/splice boxes grounding, terminations, tagging/labeling of new work
- d. Provide and install electrical equipment such as transformers, junction boxes, panels, breakers, enclosures, switch gear, pull boxes, supports, etc.
- e. Provide and install power to all mechanical and plumbing equipment, reference applicable drawings. Disconnect and safe as required for reuse. Reconnect power to new equipment as required. Prior to disconnecting, in a reasonable timeline, record panel, breaker, wire size, amps, voltage, phase information for the A/E and MC for coordination of new equipment submittals.
- f. Salvage all required equipment and re-install as applicable
- g. Provide and install Interior and Exterior Lighting, including poles, supports, emergency and exit lighting, sensors, controls, cable/wire for a complete system as required by the manufacture per the design intent.
- h. Provided in wall cores for system/equipment penetrations. Firestop according to wall type.
- i. Provide and install all bonding and grounding
- j. Provide all power wiring to all HVAC equipment. Install motor controllers/disconnects supplied by Mechanical Contractor. Reference Mechanical drawings for equipment count, type, size and coordinate. Bring to the Architects attention any discrepancies between the mechanical and electrical schedule during the procurement period.

- k. Mechanical Contractor to provide pumps, motor starters, VFDs etc. Disconnects to be provided by Mechanical Contractor. Coordinate installation of power wires, conduits etc. from source to various equipment. Controls to be by Mechanical Contractor.
- Provide power to all ADA hardware and electric hardware shown in door hardware schedule. Provide control wiring and connection for electrified door hardware. Provide additional conduits and wire/terminations for connections to electrified hardware. Coordinate with other Primes prior to installing new work.
- m. Provide all phone, CAT, and communication/networking work/systems as shown.
- n. Provide all fees required for inspections and permits.
- o. Furnish access doors for electrical access (to be installed by GC)
- Provide and maintain a temporary electric service, including lighting and power, for the site office trailers from the main building.

The Work of the Electrical 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 particular work. This prime contract is defined as, and includes, all Sections in the Divisions indicated by reference, and specific Sections noted:

- 1. Division 0 Procurement and Contracting Requirement, All Sections.
- Division 1 General Requirements All Sections, including Temporary Facilities indicated
- 3. Division 2 Existing Conditions As applicable to work of this contract
- 4. Section 07 07 8410 Penetration Firestopping, As required for the Work of this Contract
- 5. Division 14 "Conveying Equipment" As applicable to work of this contract
- 6. Division 22 "Plumbing" As applicable to work of this contract
- 7. Division 23 "Heating Ventilating and Air Conditioning" As applicable to work of this contract
- 8. Division 26 "Electrical" All Sections

10. PLUMBING CONTRACT

Work of the Plumbing includes Plumbing as a working finish system such as supply, venting, drainage, fixtures, supports, pipe, insulation, housekeeping pads, plus other construction operations traditionally recognized as plumbing work. This includes, but is not limited to, work shown on the following:

- a. Drawings:
 - a. All "title sheets, general notes, code compliance and Phasing Drawings" (General)
 - b. All "CC" series Drawings (Code Compliance)
 - c. All "P" series Drawings (Plumbing)
 - d. All "G" "GEN", Drawings, as it pertains to Work of this Contract

- e. Applicable information as shown on the "AA" "M" "S" "C" "L" "A" "E" "FA" drawings, unless noted otherwise. It also includes Administrative and coordination responsibilities.
- f. All reference to other drawings from all other drawing listed above

b. Coordination:

- a. Coordination with the work with all of the other contractors.
- b. Coordinate with Owner Supplied State Contract scope of work, see section for details

c. Demolition:

a. Provide demolition of all Plumbing equipment, piping, supports as required for a system / location gut removal. Included any work found abandoned in place or unused adjacent to work scope. Salvage, Store, Protection of equipment for reinstallation as indicated on the drawings.

b. Temporary Facilities

 a. Provide Temporary Facilities indicated as Work of this Contract in Division 1 "Temporary Facilities and Controls"

c. Construction:

- a. Selective/miscellaneous demolition after a cleared work area, as needed for new install.
- b. Salvage and re-install work as applicable.
- c. Provide and install potable water supply and distribution including valves, hoses, support, insulation, fittings and applicable accessories
- d. Provide and install insulation on all new work. Tie into existing lines and insulate up to existing work for a unified insulation performance.
- e. Provide and install bathroom fixtures, supports, anchors, shutoffs, covers, and applicable accessories.
- f. Provide and install drainage pipe, cleanouts, vents covers etc. as required
- g. Provide and install water fountains for a complete system.
- h. Provide and install water service testing, connections, and commissioning
- i. Provided inwall cores, openings, etc. for system/equipment penetrations, firestopping.
- j. Contractor to provide and install new additional valves above and beyond what is shown on the drawings (5) five 1", (2) 1 ½", (2) 2", (1) 3" for pricing purposes. Exact sizes and location to be determined in the field, at the direction of the construction manager.
- k. Provide and install plumbing piping, hangers, fittings, valves, joints and applicable accessories including insulation, labels, tags, expansions joints for a maintainable system.
- I. Provide and install all labeling, startup, cleaning, disinfection, chemicals, testing, inspection, permits, balancing, commissioning etc.
- m. Provide Training on new systems and equipment.
- n. Provide the necessary layout for all equipment and

penetrations with other Contracts

The Work of the Plumbing 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 particular work. This prime contract is defined as, and includes, all Sections in the Divisions indicated by reference, and specific Sections noted:

- 1) Division 0 Procurement and Contracting Requirement, All Sections
- 2) Division 1 General Requirements, All Sections, including Temporary Facilities indicated
- 3) Division 2 Existing Conditions, As applicable to work of this contract
- 4) Section 07 07 8410 Penetration Firestopping, as required for the Work of this Contract
- 5) Division 14 "Conveying Equipment" As applicable to work of this contract
- 6) Division 22 "Plumbing" All Sections
- 7) Division 23 "Mechanical" As applicable to work of this contract
 - a. Section 231123 Facility Natural Gas Piping are exclusively apart of the Contractors scope of work

11. MECHANICAL CONTRACT

Work of the HVAC Contract includes, but is not limited to, the following: Includes HVAC as a complete working finish system such as equipment, piping, ductwork, insulation, , supports/ pads, plus other construction operations traditionally recognized as heating, ventilating and cooling work. This includes, but is not limited to, work shown on the following:

a. Drawings:

- a. All "title sheets, general notes, code compliance and Phasing Drawings" (General)
- b. All "CC" series Drawings (Code Compliance)
- c. All "M" series Drawings (Mechanical)
- d. All "G" "GEN", Drawings, as it pertains to Work of this Contract
- e. Applicable information as shown on the "AA" "E" "FA" "P" "S" "C" "L" "A" drawings, unless noted otherwise. It also includes Administrative and coordination responsibilities.
- f. All reference to other drawings from all other drawing listed above

b. Coordination:

- a. Coordination with the work with all of the other Prime Contractors.
- Coordinate with Owner Supplied State Contract scope of work, see section for details. Coordinate and support the new HVAC equipment controls including (Building Management System -BMS). Coordinate with the Owner on existing equipment tie-in.

c. Demolition

a. Provide demolition of all HVAC equipment, piping, supports

as required for a full legacy system/equipment removal. Included any work found abandoned in place or unused adjacent to work scope. Salvage, Store, Protection of equipment for reinstallation as indicated on the drawings.

b. Temporary Facilities

a. Provide Temporary Facilities indicated as Work of this Contract in Division 1 "Temporary Facilities and Controls"

c. Construction:

- a. Selective/miscellaneous demolition after a cleared work area, as needed for new install.
- Remove and dispose of all unused equipment, fuel lines, piping, etc. adjacent to the new work and/or as shown on the Drawings
- c. Mechanical Contractor to install all new mechanical equipment. Roof mounted equipment installation shall be coordinated for location and building tie-in. Curb material will be provided by the Contractor providing the equipment (Mechanical Contractor or Owner). The roofing, insulation and curb cut in shall be by the Roofing Contractor, along with all necessary, waterproofing, etc. Any structural support modifications and building envelope penetrations will be by General Contractor.
- c. For the purposes of coordination and work phasing, Mechanical Contractor to include installing shutoff valves in the hallway on all new <u>and</u> existing equipment feed lines from main branch. Provide necessary installation, support, draining, filling, purging etc. to support the system while re-establishing system. This will allow for demolition of a portion of the system (i.e. rooms) during the school year without interrupting the system during use.
- d. Provide and install Ductwork, supports, grilles, louvers, valves, dampers hatches, insulation, and applicable accessories
- Adjust (add or remove) necessary duct extensions to make up the difference in height/locations or other necessary adjustments for grills/louvers etc. in the ceilings.
- f. Provide and install Exhaust fans, hoods, motors, fan, equipment, penetrations, pitch pockets, and applicable accessories for a complete system. Curbs to be provided by the Contractor/Vendor purchasing the equipment. See referenced roof/curb for interface between Roofing-General-Mechanical Contractor.
- g. Provide and install Pumps, controls, motor starters, VFDs. Disconnects to be provided by Mechanical Contractor. Coordinate installation of main power from disconnect/breaker/panel to be performed by Electrical Contractor.
- h. Support Owner provided vendor on install equipment, and material such as, ductwork, piping, insulation, supports etc., and controls via the Owner provided vendor for a complete cooling system.
- i. Provide and install all equipment as per the schedule on the "M" drawings not provided by Owner. Reference OWNER SUPPLIED &

- STATE/CO-OP CONTRACTED SCOPE Portion of this specification section.
- j. Provide and install mechanical piping, hangers, fittings, valves, joints and applicable accessories including insulation, labels, tags, expansions joints for a maintainable system.
- Clean existing ductwork prior to system startup, replace filters as needed
- I. Mechanical Contractor to include construction filters and change them out with permanent ones prior to startup/turnover on all equipment.
- m. Provided in wall cores, openings, etc. for system/equipment penetrations. Penetrations for exterior louvers to be laid out be the Mechanical Contractor to be cut out by the General Contractor. General Contractor to provide all required lintels and wall finish repair. Mechanical Contractor to furnish and install the louvers.
- n. Provide and install all labeling, startup, cleaning, disinfection, chemicals, testing, inspection, permits, balancing, etc... Per the specifications Commissioning shall be provided by the Owner. Mechanical Contractor shall support, as needed, the Commissioning process until acceptance.
- o. Salvage and re-install work as applicable.
- p. Provide Training on new systems and equipment as provided by this Contract. New equipment and system start up shall be by Owner provided material vendors.
- q. Provide and Install all controls components into air and hydronic systems such as, but not limited to, and shall be reviewed and coordinated with Owner provided material.
 - a. Install motor actuated dampers.
 - b. Install airflow measuring stations.
 - c. Install airside temperature and pressure sensors.
 - d. Install hydronic control valves.
 - e. Install hydronic temperature and pressure sensor wells, monitor sensors
- r. Provide all ductwork as indicated on the drawings
- s. Provide all equipment as scheduled on drawing
- t. Furnish access doors for HVAC access (to be installed by GC)
- u. Provide the necessary layout for all equipment and penetrations with other Contracts.
- v. Provide Owner training / commissioning of equipment as provided by this Contract
- w. General Requirements, including but not limited to, additional items specifically indicated as the Work of this Contract.

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 particular work. This prime contract is defined as, and includes, all Sections in the Divisions indicated by reference, and specific Sections noted:

- 1. Division 0 Procurement and Contracting Requirement, All Sections.
- 2. Division 1 General Requirements All Sections, including Temporary Facilities indicated
- 3. Division 2 Existing Conditions As applicable to work of this contract
- 4. Section 07 07 8410 Penetration Firestopping, as required for the Work of this Contract
- 5. Division 23 "Heating Ventilating and Air Conditioning", All Sections
 - a. Reference Owner Supplied and State/Co-Op Contracted Scope

12. ABATEMENT OF HAZARDOUS MATERIALS CONTRACT

Work of this Contract includes Hazardous Materials abatement/removal plus other construction operations traditionally recognized as Hazardous Materials Construction. This includes, but is not limited to, following:

1. Drawings:

- a. All "title sheets, general notes, code compliance and Phasing Drawings" (General)
- b. All "CC" series Drawings (Code Compliance)
- c. All "AA" series Drawings (Asbestos Abatement)
- d. All "G" "GEN", Drawings, as it pertains to Work of this Contract
- e. Applicable information as shown on the "FA" "M" "P" "S" "C" "L" "A" drawings, unless noted otherwise. It also includes Administrative and coordination responsibilities.
- f. All reference to other drawings from all other drawing listed above

Coordination:

- Coordination with the work of all of the other contractors. Review with adjacent Contractors and ensure that the work and facilities are always protected
- Coordinate with Owner Supplied State Contract scope of work, see section for details

3. Demolition:

- a. Asbestos containing material removal as shown in the contract documents and disposal per Code Rule 56.
- Construction of hard barriers separating abatement areas from all other areas.
- c. Removal of casework, sink, flooring, ceiling and walls, anything incidental for access to hazardous material removal.
- d. Provide demolition of all Electrical equipment, piping, supports as required for a full building gut removal. Included any work found abandoned in place or unused adjacent to work scope. Salvage, Store, Protection of equipment for reinstallation as indicated on the drawings.
- Removal of finishes noted on plans or as needed to install new work including but not limited to flooring (systems), wall (systems), ceiling (systems), soffits and misc. items attached to such.

Removal of doors, windows, roofing systems and interior partitions as required for new work. Removal and disposal of all material and/or equipment, including equipment not shown if impacting new work. Salvage, Storage, Protection and Repair work as needed as shown or described within the documents or discovered in the field as required to install new work.

4. Temporary Facilities

- a. Provide Temporary Facilities indicated as Work of this Contract in Division 1 Section 01 50 00, "Temporary Facilities and Controls"
- b. Provide and install temporary power to Hazardous Material Contractor temporary equipment as required for the Hazardous Material Contractor provided sub/supply panel.
- c. Provide and install temporary roof, water tight as specified. Temporary enclosure for building exterior.
- d. Provide and install temporary enclosure for removed windows, water tight as specified.
- e. Fire alarm devices shall be surveyed and protected during the work.

The Work of the Hazardous Material Abatement Work Contract includes, but is not limited to, the complete removal of all material within the building, the roof and windows. Removal will include items down to, but not including the structure. The Contractor is directed to examine all drawings since certain details and/or notes may appear anywhere therein that apply to his/her particular work. Focus shall be spent on other Prime documents to ensure material removals for the purpose of installation of new material and equipment. This prime contract is defined as, and includes the following listed sections:

- 1. Division 0 Procurement and Contracting Requirement, All Sections
- 2. Division 1 General Requirements, All Sections
- 3. Division 2 Existing Conditions, All Sections
 - Sections 020800 are exclusively a part of the Contractors' scope of work
- 4. Section 07 078410 Penetration Firestopping, as required for the Work of this Contract

13. ADDITIONAL SCOPING

Definition of Extent of Prime Contract Work; Additional Prime Contract Work not previously described.

- a. All Prime Contractors are responsible for reviewing plans and specs as they pertain to their scope of work mentioned in the contract documents. Scopes of work referenced may be found in multiple locations throughout the plans, specifications and addendums. Contractor will conform to their own bid set of documents.
- b. Local custom and trade union jurisdictional settlements do not control the scope of work included in the prime contract. When a potential jurisdictional dispute or similar interruption of work is first identified or threatened, the affected prime contracts shall promptly negotiate a reasonable settlement to avoid or minimize the pending interruption and

delays.

- c. All OSHA safety and hazardous materials regulations will be enforced on this project. All Contractors must submit a safety program, a hazardous materials program, (all required data must be maintained at the job site) and attend safety meetings. Toolbox talks will be required from each prime/sub contractor.
- d. After completion of the demolition/removals by the Hazardous Material Contractor, all Contractors are responsible for removals and any debris caused by their work. Daily clean- up and disposal is required by each Contractor for the periods in which that Contractor is performing work on site, on a day selected by the Construction Manager. Each trade will assign at least one person to the weekly clean-up; the name of this person is to be submitted to the Construction Manager. Any Contractor not providing personnel will be "backcharged" for labor provided by the Construction Manager.
- e. All exposed finishes must be ready to receive paint, etc.; all concealed openings (piping, ductwork, conduit, etc.) must be repaired to comply with specified wall or deck conditions.
- f. Multiple Crews: To maintain the project schedule, the Prime Contractor is to provide multiple crews as required. Each crew is to be furnished with its own supervision, equipment, access and other means necessary to maintain the Project Milestone Schedule.
- g. Supervision: The proposed project manager and field superintendent for the project is to have at least five years' experience in the proposed position. Each successful bidder shall submit resumes to the Construction Manager for the proposed project manager and field superintendent for the project. This information will be reviewed with the Owner, Architect and Construction Manager for approval. Should the Project Manager and/or Superintendent prove unqualified for the 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. Action by the contractor must be made within seven calendar days of receipt of such letter.
- h. All Prime Contractors shall return areas disturbed by their work activities to condition prior to start of work when in occupied areas. Timing to be coordinated with the Construction Manager and Owner.
- i. All Prime Contractors shall maintain within its field office a complete and current set of Contract Documents (including any Addenda, Change Orders, and Modifications thereto), approved shop drawings, samples, color schedules and other data pertinent to the Project.
- j. All Prime Contractors to survey existing work and submit to the Construction Manager a list of damaged areas (i.e. plaster walls, woodwork) prior to commencing work. Any damaged areas not identified prior to work shall be the responsibility of the contractor/ Contractors working in that area. Construction Manager will have photos of existing conditions on file for reference. Failure to submit these photos, Contractor agrees that the location is free of damage/defect prior to the start of work.

- k. The General Contractor is required to submit a construction schedule based on the milestone dates to the Construction Manager for review and comment no later than 2 weeks after a Notice to Proceed for the work is issued. Other Prime Contractors have 5 days to complete their construction and submittal schedules after the General Contractor distributes the schedule. The General Contractor will continue to develop the schedule until all input is entered and agreed upon.
- I. Unless a specific item or material is noted as to remain the Owner's property or to become the Contractor's property, any material having salvage or reuse value shall be inspected/retained by the Owner. If the Owner wishes to retain this material, it shall be turned over to him on the site where directed. If the Owner designates the material as scrap, it shall become the Construction Manager's property and removed/disposed or from the site by the Contractor. Material having salvage value shall be carefully removed. If the Construction Manager designates the material as waste/debris/trash, it shall become the Contractor's property and removed from the site by the contractor. Material having salvage value shall be carefully removed.
- m. When the building is occupied and fire alarm and safety system work is in progress, the Electrical Contractor shall continuously maintain the existing building's fire alarm and detection system, exit and emergency lighting system or provisions must be made by the Electrical Contractor to provide equivalent safety. Electrical Contractor must notify the Construction Manager and Owner of any non-operating systems immediately.
- n. All personnel on site shall at all times have all required personnel protective equipment on at all times.
- o. All personnel on site shall at all times have a photo ID displayed where visible. Those without will be removed from site at once. If the same individual fails to have the ID a second time they will be removed from site and not be allowed back on site.

14. TESTING

Required testing and test procedures are indicated under each Division of the Technical Specifications. Other testing shall be performed per generally accepted standards.

The Architect shall reserve the right to require additional information as is deemed necessary to fully evaluate testing results.

The Owner shall employ and pay for an independent testing and inspection agency for testing requirements of their work as assigned by this scope of work. All testing shall be per technical specification requirements. The Prime Contractor requiring testing will notify the Construction Manager 3 days in advance of the required testing to allow for coordination and scheduling. Failure to give sufficient notice will require the prime contractor to pay for alternate testing to

satisfy the specification.

15. WORK SEQUENCE

The Work will be conducted to provide the least possible interference to the activities of the Owner's personnel.

- All contract scopes of work in unoccupied areas of work can be performed on weekdays from 7:00 AM to 3:30 PM unless otherwise noted. Work cannot be performed in occupied areas or adjacent to. Should work be required and coordinated, separation of work is mandatory per applicable codes/standards. When this is not feasible, work shall be scheduled off-hours, vacations and weekends for occupied areas. A representative from the Construction Manager firm must be on site at all times that work is being performed. Second shift is considered after bus dismissal and coordinated for various after school clubs/activities/operations. For the purpose of the bid, the scopes of work below are assumed to be second, shift, weekends or off shift times and included with the Base Bid.
 - a. Work in the months of Sept through June, less holiday breaks and school closures
 - b. Any activity requiring access to student faculty occupied areas.
 - c. Periods for student testing disturbances
 - d. Tie-ins requiring shutdowns, for the duration of the outage.

Work in Zone 1 is permissible to be normal day hours, less the activity of concrete slab/sidewalk demo and activities with the use of a crane.

- If a contractor fails to maintain the progress as indicated by the milestone schedule by no other fault but its own and requires overtime to complete the work, the contractor shall make arrangements with the Construction Manager 24 hours in advance and pay for a Construction Manager's superintendent at \$125.00 per hour. In the event that the cause for delay is multi-contract, then the costs shall be distributed evenly among contracts. Advise the Construction Manager 48 hours prior to commencing work inside the building.
- Failure to progress the schedule in a fashion to maintain the overall completion date that causes other Primes to "accelerate" is subject to back charges as determined by the Architect and CM. Prime Contractor accelerating is to place CM and Prime on notice prior to any additional charges will be approved.
- 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.
- 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.

Each Contractor shall inspect the site and review the AHERA report on file for the presence of asbestos. Unless otherwise noted, there will be asbestos containing material in place that will require work to take place in the vicinity of, around and/or next to. The prime contractor that will be working above ceilings, demolishing, in crawl spaces, boiler rooms and all other areas that may contain asbestos per the AHERA report, shall employ "Allied Trades: certified/licensed tradesman as part of the onsite workforce".

16. OCCUPANCY REQUIREMENTS

The General Work Contractor shall provide indoor air quality management as specified by the Department of Labor and OSHA for the building, when the building is enclosed, as determined by the Construction Manager.

- a. Provide an exhaust air system for the project indoor areas that could produce fumes, VOC's off-gasses, gasses, dusts, mists, or other emissions.
- b. Exhaust air system for the project areas that could produce emissions listed in Paragraph 1 shall be utilized.
- c. Provide temporary partitions and air seals to prevent the migration of airborne contaminants from unoccupied areas to occupied areas when applicable.

Quality assurance:

- a. Maintain negative pressure between the work area and the space surrounding the
- b. Before start of work, submit a design for the exhaust air system. Do not begin work until approval of the Owner is obtained.
- c. Location of the machines in the work space.
- d. Description of the methods used to test air flow and pressure differential.

System operation:

- A sufficient quantity of exhaust fans in existing window openings or other approved locations shall be operated in accordance with the following applicable standards.
- b. Exhaust air system shall operate for a minimum of 72 hours after work is completed, or until all materials have cured sufficiently to stop out gassing of fumes or odors and area has been ventilated to remove all detectable traces of odors and fumes.
- c. Maintain twenty-five (25) feet clearance from all temporary exhaust outlets to all active building outdoor air intakes.

17. PROJECT MILESTONE SCHEDULE

See the milestone schedule to be provided in Addendum.

All Prime Contractors are required to submit a schedule based on the milestone dates to the Construction Manager for review and comment no later than 10 days after a Notice to Proceed for the work is issued.

Orange-Ulster BOCES
Emanuel Axelrod Special Education Center
Additions & Alterations

18. ALTERNATES

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.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 011501 - SPECIAL PROJECT REQUIREMENTS

Excerpts from 8 NYCRR Section 155.5 as they address "General Safety and Security Standards for Construction Projects".

STATEMENT OF PURPOSE: "The occupied portion of any school building shall always comply with the minimum requirements necessary to maintain a certificate of occupancy"

1.1 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the General Conditions and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. All contractors, subcontractors, Sub-subcontractors, vendors and the like shall monitor their workers and require that they adhere to the following safety provisions during all construction and maintenance activities for the duration of the project.

1.2 REQUIREMENTS INCLUDED

- A. Safe and Secure Storage of Construction Materials
- B. Fencing Project; Material storage areas; Container/Refuse areas
- C. Gates Manned during working hours; locked and secure off hours.
- D. Sidewalk bridges, security barriers, etc. reference "Exterior Renovations"
- E. Worker identification system
- F. Temporary partitions separation of construction areas from occupied spaces; construction, materials, inspection and maintenance
- G. Worker access both horizontal and vertical in occupied buildings
- H. Debris removal.
- I. Ventilation of workspaces
- J. Exiting
- K. Fire and hazard prevention
- L. No Smoking
- M. Fire extinguishers
- N. Temporary sprinklers (if any)
- O. Smoke detectors (temporary)
- P. Fire watch and maintenance of existing fire alarm systems
- Q. Storage of gas and welding equipment
- R. Noise abatement procedures
- S. Construction fume controls
- T. Off-Gassing/bake out procedures
- U. Manufacturer's Material Safety Data Sheet log
- V. Asbestos Code Rule 56
- W. Asbestos TEM
- X. Lead Abatement/Lead paint

- 1.3 SAFE AND SECURE STORAGE OF CONSTRUCTION MATERIALS Coordinate with Sections 01 50 00 and 01 61 00 each as included with these documents.
 - A. Upon written approval from the Owner materials stored on the Site shall be neatly arranged and protected and shall be stored in an orderly fashion in locations that shall not interfere with the progress of the Work.

<u>NOTE</u> - If approval is given to store materials in any part of the building area, they shall be so stored as to cause no overloading of the structure.

- 1.4 FENCING PROJECT; MATERIAL STORAGE AREAS; CONTAINER/REFUSE AREAS Coordinate with Section 01 50 00
 - A. Barrier fencing constructed as outlined in Section 01 50 00 shall be provided surrounding all work areas, material storage locations and around dumpsters and/or chutes when involved with demolition/removal operations.
 - B. Fencing shall be maintained in good sound condition throughout the entire course of construction by the Contractor and removed only when directed by the Architect.

1.5 GATES

- A. Gates in construction fencing shall be of construction outlined in Section 01 50 00 and shall be under the Contractors' supervision throughout the workday and shall be secured in a locked condition at the close of any single business day and on all non-workdays. Gates shall be manned at all times work is in progress.
- 1.6 SIDEWALK BRIDGES, SECURITY BARRIERS, ETC. REFERENCE "EXTERIOR RENOVATIONS"
 - A. As applicable to the project involved, provide overhead protective devices for the work consisting of tubular framed scaffold bridges, joist trusses and solid decking. Provide guard rails, lights and warning signs.
- 1.7 WORKER IDENTIFICATION SYSTEM Coordinate with Section 01 10 00, Article 1.01.
 - A. All Contractors' employees shall use a single means of access and egress, except in the case of emergency, to be designated by the Contractor.
 - B. The Contractor shall, for all work covered under the Contract, establish a security control system for personnel and material involved with the work herein.
 - C. The control system shall include photo identification badges and the like so as to insure against unauthorized entry to the site and resultant entry to the building proper.
- 1.8 TEMPORARY PARTITIONS SEPARATION OF CONSTRUCTION AREAS FROM OCCUPIED SPACES; CONSTRUCTION, MATERIALS, INSPECTION AND MAINTENANCE Coordinate with Section 01 50 00.
 - A. Provide temporary partitions from floors to underside of structure above, in sash and any other openings created by new construction, additions and alterations.
 - B. Such partitions shall be constructed dust-tight using steel studs and acoustically and/or thermally insulated, Level 1 taped fire rated gypsum.
 - C. Locate enclosures as directed by the Architect and/or as shown on the drawings.

- D. In addition to partitions and closures, provide tight fitting filters over all return air grilles and/or open ducts in order to properly protect central air handling equipment.
- E. <u>Take all necessary precautions to avoid unnecessary dust spreading to adjoining</u> rooms and spaces.
- F. Keep all doors to spaces closed and provide positive seals around cracks, frames, doors and other openings within work areas.
- G. WHERE EXTERIOR CLOSURES ARE REQUIRED, INSULATE SAME TO MAINTAIN A TEMPERATURE OF SIXTY-FIVE (65) DEGREES F. WITHIN THE PLANT WITHOUT THE USE OF SPECIAL HEATING EQUIPMENT.
- H. All temporary enclosures/partitions/containment barriers shall be periodically inspected and maintained in good repair so as to prevent exposure to dust and contaminants outside the work and/or containment areas.

1.9 WORKER ACCESS BOTH HORIZONTAL AND VERTICAL IN OCCUPIED BUILDINGS

- A. A specific stairwell and/or elevator shall be assigned for construction worker use during work hours. Workers may not use corridors, stairs or elevators designated for students or school staff.
- 1.10 DEBRIS REMOVAL Coordinate with Sections 01 50 00, 01 77 00 and 02 41 20 as applicable to Project.
 - A. Large amounts of debris must be removed by use of enclosed chutes or similar systems. There shall be no movement of debris through corridors of occupied spaces of the building. No materials shall be dropped or thrown outside the walls of the building.
 - B. All occupied parts of the building or buildings affected by renovation activity shall be cleaned at the close of each workday.
 - C. School buildings occupied during any construction period shall maintain required health, safety and educational capabilities at all times that classes are in session.

1.11 VENTILATION OF WORKSPACES - SEE SECTIONS 02 82/83 00

1.12 EXITING

A. At all times, the Contractor is responsible for maintenance of safety and egress requirements from work areas.

NOTE: All legal forms of egress must be maintained at all times.

- B. Provide temporary exit passage system(s) with guard and handrails and ramps and such other measures indicated on the drawings and as applicable to the particular project.
- 1.13 FIRE AND HAZARD PREVENTION See Section 01 50 00 for requirements for fire watches, storage and maintenance of welding gasses and temporary heating and the like.
- 1.14 NO SMOKING No smoking is permitted on the grounds or within the construction area of any project.

- 1.15 FIRE EXTINGUISHERS Fire extinguishers shall be provided within the work area and shall be monitored on a scheduled maintenance basis and so tagged to indicate same.
- 1.16 TEMPORARY SPRINKLERS (IF ANY) See Section 01 50 00 for applicable text and requirements.
- 1.17 SMOKE DETECTORS The respective prime contractor shall provide a temporary battery powered smoke detection system for all areas under construction.
- 1.18 FIRE WATCH AND MAINTENANCE OF EXISTING FIRE ALARM SYSTEMS See Section 01 50 00
 - A. All Contractors shall comply with the safety provisions of the National Fire Protection Association's "National Fire Codes" pertaining to the work and, particularly, in connection with any cutting or welding performed as part of the work.
 - B. During welding or cutting operations, a contractor's man shall act as a fire watcher. The fire watcher shall have proper eye protection and suitable firef ighting equipment including fire extinguisher (bearing current inspection Certificate), protective gloves and any other equipment deemed necessary.
 - C. The Respective Prime Contractor will provide for and maintain the proper operation of fire alarm and smoke detection systems in all areas throughout the course of the project. The Respective Prime Contractor will provide all labor and material required to accomplish this in occupied areas of the school buildings and in areas under construction.
- 1.19 STORAGE OF GAS AND WELDING EQUIPMENT See Section 01 50 00 for specific requirements and controls.

1.20 NOISE ABATEMENT PROCEDURES

- A. Develop and maintain a noise abatement program and enforce strict discipline over all personnel to keep noise to a minimum. Equipment and work shall not produce noise in excess of 60db in occupied areas or shall be scheduled for off hours or acoustical abatement procedures shall be taken. Noise level measurements (dba) shall be taken with a type 2 sound level meter in the occupied space in a location closest to the source of the noise.
- B. Execute construction work by methods and by use of equipment which will reduce excess noise.
- C. Equip air compressors with silencers, and power equipment with mufflers.
- D. As established in Section 01 10 00, all contractors shall abide by the "no work" periods designated by the Owner.
- 1.21 CONSTRUCTION FUME CONTROLS See Article 1.11 herein.
- 1.22 OFF-GASSING/BAKE OUT PROCEDURES Not Required
- 1.23 MATERIAL SAFETY DATA SHEET LOG Coordinate with Section 01 33 00
 - A. Contractor shall maintain "MSDS" file on site, accessible to workers and Uniform Safety Standards

otherwise in compliance with jurisdiction's "Right To Know" legislation.

NOTE: The submittal of the required MSDS information shall be segregated from the required material/shop drawing/sample submittals in a separate binder and not co-mingled with the technical submittals, failure to so conform will be cause for rejection of any submittal.

1.24 ASBESTOS CODE RULE 56 AND ASBESTOS CONTAMINATED MATERIALS (ACM)

- A. Abatement projects as defined by Rule 56 shall not be performed while the building is occupied.
- B. In the event asbestos-contaminated materials are encountered during the work Contractor shall immediately notify the Architect and/or Owner for instructions as to procedures to be taken.
- C. All asbestos abatement projects shall comply with all applicable federal and State laws including but not limited to the New York State Department of Labor industrial code rule 56(12 NYCRR 56), and the federal Asbestos Hazard Emergency Response Act (AHERA), 40 CFR Part 763 (Code of Federal Regulations, 1998 Edition, Superintendent of Public Documents, Government Printing Office, Washington, DC 20402; 1998; available at the Office of Facilities Planning, Education Building Annex, Room 1060, State Education Department, Albany, New York 12234). Large and small asbestos projects as defined by 12 NYCRR 56 shall not be performed while the building is occupied. Minor asbestos projects defined by 12 NYCRR 56 as an asbestos project involving the removal, disturbance, repair, encapsulation, enclosure or handling of 10 square feet or less of asbestos or asbestos material, or 25 linear feet or less of asbestos or asbestos material may be performed in unoccupied areas of an occupied building in accordance with the above referenced regulations.

1.25 LEAD ABATEMENT/LEAD PAINT

- A. In the event lead based paint is encountered during the work Contractor shall immediately notify the Architect and/or Owner for instructions as to procedures to be taken.
- B. Attention is directed to technical Section 02 83 00 for "protocols" concerning lead paint removals and preparation.
- C. Any construction or maintenance operations which will disturb lead based paint shall be abated pursuant to protocols detailed in the "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing" (June 1995; U.S. Department of Housing and Urban Development, Washington, DC 20410; available at the Office of Facilities Planning, Education Building Annex, Room 1060, State Education Department, Albany, NY 12234). All areas scheduled for construction as well as areas of flaking and peeling paint shall be tested for the presence of lead and abated or encapsulated in accordance with the above noted guidelines

End of Section

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for unit prices.

1.2 DEFINITIONS

A. Unit price is a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.3 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. 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.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.
- E. Unit prices represent the cost, in place, unless otherwise specified, of the unit of measure or quantity for each item of material or labor, or both, or of equipment in each respective trade or classification listed herein. All unit prices include all cost of work to the Contractor, including all charges for materials, labor, plant, equipment, overhead, profit, additional insurance, taxes and all charges of whatever kind.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

- 3.1 SCHEDULE OF UNIT PRICES GENERAL CONSTRUCTION CONTRACT #1 ONLY
 - A. Unit Price No. GC-1: Removal and Reinstallation of Existing ACT Ceilings
 - 1. Description: Removal and reinstallation of existing ACT ceilings for spaces adjacent to work areas, in addition to what is scheduled on the Contract

Documents. Contractor shall assume existing ceilings at approximately 9-foot height.

- 2. Unit of Measurement: Per Square Foot
- 3. Base Bid includes amounts as indicated on Drawings

B. Unit Price No. GC-2: New Chase Walls

- Description: Provide chase wall assembly including 3-5/8" metal stud framing, 1
 layer 5/8" gypsum board installation at one side, and finishes (paint and base).
 Contractor shall assume finish ceilings at approximately 9-foot height, and 12-foot height to underside of decking.
- 2. Unit of Measurement: Per Square Foot
- 3. Base Bid includes amounts as indicated on Drawings

C. Unit Price No. GC-3: Rock Removal

- 1. Description: On-site rock removal including excavation, removal and disposal.
- 2. Unit of Measurement: Per Cubic Yard
- 3. Base Bid includes amounts as indicated on Drawings

D. Unit Price No. GC-4: Unsuitable Soils

- Description: Contractor shall excavate, remove and dispose of unsuitable soils.
 Include the placement and compaction of suitable fill materials to replace over excavated materials back to required depths for installation of new work. No payment for excavation or backfill of suitable site soils used in installation of work shall be made on this pay item.
- 2. Unit of Measurement: Per Cubic Yard
- 3. Base Bid includes amounts as indicated on Drawings

3.2 SCHEDULE OF UNIT PRICES – ABATEMENT CONTRACT #2 ONLY

A. Unit Price No. HAZ-1: Mudded Joint Fittings

- Description: Abatement and removal of mudded joint fittings (any size) while under previously erected containment, in addition to what is scheduled in the Contract Documents.
- 2. Unit of Measurement: Per Each Fitting
- 3. Base Bid includes amounts as indicated on Drawings

B. Unit Price No. HAZ-2: Pipe Insulation

- 1. Description: Abatement and removal of pipe insulation while under previously erected containment, in addition to what is scheduled in the Contract Documents.
- 2. Unit of Measurement: Per Linear Foot
- 3. Base Bid includes amounts as indicated on Drawings

C. Unit Price No. HAZ-3: ACT Ceiling Tiles

- 1. Description: Abatement and removal of ACT ceiling tiles while under previously erected containment, in addition to what is scheduled in the Contract Documents.
- 2. Unit of Measurement: Per Square Foot
- 3. Base Bid includes amounts as indicated on Drawings

D. Unit Price No. HAZ-4: Floor Mastic

- 1. Description: Abatement and removal of floor mastic while under previously erected containment, in addition to what is scheduled in the Contract Documents.
- 2. Unit of Measurement: Per Square Foot
- 3. Base Bid includes amounts as indicated on Drawings

E. Unit Price No. HAZ-5: Exterior Caulking

- 1. Description: Abatement and removal of exterior window and door caulking in addition to what is scheduled in the Contract Documents.
- 2. Unit of Measurement: Per Linear Foot
- 3. Base Bid includes amounts as indicated on Drawings

3.3 SCHEDULE OF UNIT PRICES – ROOFING CONTRACT #3 ONLY

A. Unit Price No. ROOF-1: Rigid Insulation

- 1. Description: Provide 2inches rigid insulation at roofing, in addition to what is scheduled in the Contract Documents.
- 2. Unit of Measurement: Per Square Foot
- 3. Base Bid includes amounts as indicated on Drawings

B. Unit Price No. ROOF-2: Tapered Insulation

- Description: Provide tapered rigid insulation at roofing, in addition to what is scheduled in the Contract Documents.
- 2. Unit of Measurement: Per Square Foot
- 3. Base Bid includes amounts as indicated on Drawings

3.4 SCHEDULE OF UNIT PRICES – PLUMBING CONTRACT #4 ONLY

A. Unit Price No. PC-1: Piping Insulation

- 1. Description: Provide piping insulation, in addition to what is scheduled in the Contract Documents.
- 2. Unit of Measurement: Per Linear Foot: 1" or less; 1.25"-2"; 2.5"+ Greater
- 3. Base Bid includes amounts as indicated on Drawings

B. Unit Price No. PC-2: Ball Valve Shutoffs

- 1. Description: Provide ball valve shutoffs, in addition to what is scheduled in the Contract Documents.
- 2. Unit of Measurement: Per Each Valve: 1" or less; 1.25"-2"; 2.5"+ Greater
- 3. Base Bid includes amounts as indicated on Drawings

C. Unit Price No. PC-3: Roof Drain Body and Piping

- 1. Description: Provide one roof drain body and 50feet of 4-inch storm piping, in addition to what is scheduled on the Contract Documents.
- 2. Unit of Measurement: Per Each Occurrence
- 3. Base Bid includes amounts as indicated on Drawings

3.5 SCHEDULE OF UNIT PRICES – MECHANICAL CONTRACT #5 ONLY

- A. Unit Price No. MC-1: Piping Insulation
 - 1. Description: Provide piping insulation, in addition to what is scheduled in the Contract Documents.
 - 2. Unit of Measurement: Per Linear Foot: 1" or less; 1.25"-2"; 2.5"+ Greater
 - 3. Base Bid includes amounts as indicated on Drawings
- B. Unit Price No. MC-2: Ball Valve Shutoffs
 - 1. Description: Provide ball valve shutoffs, in addition to what is scheduled in the Contract Documents.
 - 2. Unit of Measurement: Per Each Valve: 1" or less; 1.25"-2"; 2.5"+ Greater
 - 3. Base Bid includes amounts as indicated on Drawings

3.6 SCHEDULE OF UNIT PRICES – ELECTRICAL CONTRACT #6 ONLY

A. No Unit Prices for Electrical Contract No. 6

END OF SECTION 012200 UNIT PRICES

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SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.2 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. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. 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.

1.3 PROCEDURES

- A. Coordination: Revise 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 revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Add Alternate No. 1: EXTERIOR WINDOWS

- 1. Description of Alternate: Remove existing windows and interior sills, and prep for new window installation. Provide and install new window/storefront assembly and associated flashings, trim, and new solid surface sills at interior. Abatement work required at windows in Original 1969 wing per abatement specifications.
- 2. Base Bid Work: Existing windows and sills to remain. Provide new window treatments at all renovated spaces.
 - Abatement contractor shall refer to Architectural Drawings for windows/storefronts that are included in base bid verses Add-Alternate No.1.
- 3. Contracts Involved in this Alternate:
 - a. Contract No. 1 General Construction Work
 - b. Contract No. 2 Abatement Work

B. Add Alternate No. 2A: RENOVATIONS TO EXISTING GROUND FLOOR CLASSROOMS/OFFICES – AREA A

- Description of Alternate: Demolition of existing classrooms including removals of finishes, fixtures, abatement, plumbing, mechanical and electrical equipment as noted on the drawings. Renovation work including new finishes (flooring, paint, ceilings), window treatments, casework/millwork, mechanical and electrical work and all associated work as noted on the drawings.
- 2. Alternate Area A = Classrooms 129, 131, 133, 137, 139, 141 and Offices 135, 135A, 135B, 143 and 143A; along with adjacent areas as required for the new work.
- 3. Base Bid Work: Existing conditions to remain.
- 4. Contracts Involved in this Alternate:
 - a. Contract No. 1 General Construction Work
 - b. Contract No. 2 Abatement Work
 - c. Contract No. 5 Mechanical Work
 - d. Contract No. 6 Electrical Work

C. Add Alternate No. 2B: RENOVATIONS TO EXISTING GROUND FLOOR CLASSROOMS/RESOURCE ROOMS – AREA B

- Description of Alternate: Demolition of existing classrooms including removals of finishes, fixtures, abatement, plumbing, mechanical and electrical equipment as noted on the drawings. Renovation work including new finishes (flooring, paint, ceilings), window treatments, casework/millwork, mechanical and electrical work and all associated work as noted on the drawings.
- 2. Alternate Area B = Classrooms 111, 113, 123, 125 and Converting existing Classroom 115 to Resource Rooms 118 and 120; along with adjacent areas as required for the new work.

- 3. Base Bid Work: Existing conditions to remain.
- 4. Contracts Involved in this Alternate:
 - a. Contract No. 1 General Construction Work
 - b. Contract No. 2 Abatement Work
 - c. Contract No. 5 Mechanical Work
 - d. Contract No. 6 Electrical Work

D. Add Alternate No. 2C: RENOVATIONS TO EXISTING GROUND FLOOR CLASSROOMS – AREA C

- Description of Alternate: Demolition of existing classrooms including removals of finishes, fixtures, abatement, plumbing, mechanical and electrical equipment as noted on the drawings. Renovation work including new finishes (flooring, paint, ceilings), window treatments, casework/millwork, mechanical and electrical work and all associated work as noted on the drawings.
- 2. Alternate Area C = Classrooms 103, 105, 107; along with adjacent areas as required for the new work.
- 3. Base Bid Work: Existing conditions to remain.
- 4. Contracts Involved in this Alternate:
 - a. Contract No. 1 General Construction Work
 - b. Contract No. 2 Abatement Work
 - c. Contract No. 5 Mechanical Work
 - d. Contract No. 6 Electrical Work

E. Add Alternate No. 3: RENOVATIONS TO EXISTING POOL AND ADJACENT TOILET ROOM SPACES

- Description of Alternate: Gut Demolition of existing pool and adjacent Toilet Room Spaces including removals of finishes, fixtures, pool equipment and accessories, abatement, plumbing, mechanical and electrical equipment as noted on the drawings. Renovation work including infill of pool for new concrete floor slab, new finishes (flooring, paint, ceilings), modifications to toilet rooms to create storage spaces, plumbing, mechanical and electrical work and all associated work as noted on the drawings.
- 2. Base Bid Work: Existing conditions to remain.
- 3. Contracts Involved in this Alternate:
 - a. Contract No. 1 General Construction Work
 - b. Contract No. 2 Abatement Work
 - c. Contract No. 4 Plumbing Work
 - d. Contract No. 5 Mechanical Work
 - e. Contract No. 6 Electrical Work

F. Add Alternate No. 4: EXTERIOR PLAZA RENOVATIONS

 Description of Alternate: In lieu of new concrete paving/sidewalk at courtyard/plaza around New Addition, Contractor to provide triangular pavers, landscape elements, plantings, benches, planters, greenwall and additional lighting as noted on the drawings.

- 2. Base Bid Work: Removals at existing plaza as noted including concrete pavement, curbs, planters, drainage, utilities, and equipment as noted on drawings. Provide new concrete paving/sidewalks, curbs, fencings, pads, flag pole, plantings, grading, drainage and utilities as noted on drawings.
- 3. Contracts Involved in this Alternate:
 - a. Contract No. 1 General Construction Work
 - b. Contract No. 6 Electrical Work

END OF SECTION 012300 ALTERNATES

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ALTERNATES

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

- 1. Section 012300 "Alternates" for products selected under an alternate.
- 2. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and assemblies which deviate from the requirements of the Contract Documents and proposed by Contractor which the Contractor deems will perform the same function and have equal capabilities, service life, economy of operations, and suitability for the intended purpose.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 ACTION SUBMITTALS

- A. Substitution Requests: Submit requests for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use the electronic version of form included as an attachment to this Section; submit in portable document format (.pdf).
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - Coordination information, including a list of changes or revisions 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. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures in .pdf format.
- e. Samples, where applicable or requested.
- f. Certificates and qualification data, where applicable or requested.
- g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
- h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
- i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES
- j. 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 date of receipt of purchase order, lack of availability, or delays in delivery.
- k. Cost information, including a proposal of change, if any, in the Contract Sum.
- I. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
- m. 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.
- Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Forms of Acceptance: Change Order.

1.4 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 30 days prior to time required for preparation and review of related submittals.
 - Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Requested substitution does not require revisions to the Contract Documents.
 - c. Requested substitution provides sustainable design characteristics that specified product provided for achieving LEED prerequisites and credits.
 - d. Substitution request is fully documented and properly submitted.
 - e. Requested substitution will not adversely affect Contractor's construction schedule.
 - f. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - g. Requested substitution is compatible with other portions of the Work.
 - h. Requested substitution has been coordinated with other portions of the Work.
 - i. Requested substitution provides specified or superior warranty.
 - j. Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule; or if requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
 - k. Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
 - I. Maintenance service and source of replacement parts, as applicable, is available similar to the specified product.
 - m. Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
 - n. Proposed substitution does not affect dimensions and functional clearances.

- o. Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 120 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.
 - Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require revisions to the Contract Documents or, if revisions are required, the Contractor acknowledges that the cost of the Architect's redesign fee will be deducted from the Contract Price.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Requested substitution provides sustainable design characteristics that specified product provided for achieving LEED prerequisites and credits.
 - e. Substitution request is fully documented and properly submitted.
 - f. Requested substitution will not adversely affect Contractor's construction schedule.
 - g. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - h. Requested substitution is compatible with other portions of the Work.
 - i. Requested substitution has been coordinated with other portions of the Work.
 - j. Requested substitution provides specified or superior warranty.
 - k. Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule; or if requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
 - I. Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
 - m. Maintenance service and source of replacement parts, as applicable, is available similar to the specified product.
 - n. Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
 - o. Proposed substitution does not affect dimensions and functional clearances.

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p. Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

ATTACHMENT: SUBSTITUTION REQUEST FORM

Date:

By:

Telephone/Fax:

Approved For Subcontractor Submittal:

Orange-Ulster BOCES Emanuel Axelrod Special Education Center Additions & Alterations

SUBSTITUTION REQUEST FORM

To:			<u>Project</u>	t <u>:</u>
Section	Page	Paragraph	Specified Item	
Att. pho FURTHI Di	ached data shall tographs, perform ER, The P mensions in	include, in a tabular mance and laboratory Proposed Sub dicated on the o	estitution WILL (OR Willrawings?	on - product description, specifications, drawings, ons of said data <u>clearly</u> identified.
Ot Ma Th	her trades an anufacturer's e constructi	nd abutting or ir signary guarantees and on schedule?	terconnection work? warranties?	
	1)	NOTE - If Subs	stitution WILL affect any ite	m above, explain in detail.)
1. 2.	Any a electr Any a	and all changes o/mechanical sy and all additiona	to the building design, including stems engineering (if any), deal construction costs caused by	ng structural, civil or tailing; <u>and</u>
			superior to the Specified	
SUBMITTED:			DESIGN PROFESSIONAL'S COMMENTS	
By:			Accepted	Accepted as Noted
Firm:			Not Accepted	Received Too Late

Contractor:

Date:

By:

Date:

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 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.

1.3 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect within 10 days after Notice of Award of Contract or at the preconstruction meeting, whichever comes first.
- B. Format and Content: Use 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. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 - 2. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related specification section or division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.

- f. Change Orders (numbers) that reflect value.
- g. Dollar value as a percentage of the Contract Sum to nearest onehundredth percent, adjusted to total 100 percent.
- Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum. No line item should exceed 10% of the contract sum.
- 4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
- 5. 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 required, include evidence of insurance.
- 6. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
- 7. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
- 8. 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.
- 9. Include a line item for each of the following in the specified percentage of the Contract Sum:
 - a. Submittals and Shop Drawings: 1%
 - b. Meetings and Documentation: 2%
 - c. O&M and Closeout: 3%
 - d. Punch List: 1%
- 10. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when fully executed Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 - 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

- 2. Each Application for Payment after the Initial Application for Payment shall include lien wavers for amounts paid with respect to the immediately preceding Application for Payment.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
 - 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- C. Application for Payment Forms: Use AIA Document G732 and AIA Document G703 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. Architect 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 for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 - 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 - 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 - 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 - 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- 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, before 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. Waiver Delays: Submit each Application for Payment with Contractor's waiver of mechanic's lien for construction period covered by the application.
 - a. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
- 5. Waiver Forms: Submit partial waivers of lien on form included at the end of this Section, executed in a manner acceptable to Owner.
- G. Attachments to Applications for Payment: In addition to other requirements stated in the Contract Documents, include with each Application for Payment fully executed Partial Release and Waiver of Liens on the form included at the end of this Section. In addition, provide a current copy of the approved Contractor's Construction Schedule, signed, indicating agreement to the schedule.
- H. Transmittal: Submit two signed and notarized original copies of each Application for Payment to the Architect by a method ensuring receipt within 24 hours. Both copies shall include waivers of lien, and all other required attachments.
 - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- I. Initial Application for Payment: Administrative actions and submittals (that have been previously approved) that must precede or coincide with submittal of first Application for Payment include the following:
 - 1. List of subcontractors.
 - 2. Schedule of values.
 - 3. Contractor's construction schedule.
 - 4. Products list.
 - 5. Submittal schedule.
 - 6. List of Contractor's staff assignments.
 - 7. List of Contractor's principal consultants.
 - 8. Copies of building permits.
 - 9. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 - 10. Initial progress report.
 - 11. Report of preconstruction conference.
 - 12. Certificates of insurance and insurance policies.
 - 13. Performance and payment bonds.
 - 14. Data needed to acquire Owner's insurance.
 - 15. Initial settlement survey and damage report if required
- J. Application for Payment at Substantial Completion: After Architect issues 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 Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- K. Final Payment Application: After completing Project closeout requirements, 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.
 - 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 - 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."
 - 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
 - 6. AIA Document G707, "Consent of Surety to Final Payment."
 - 7. Evidence that claims have been settled.
 - 8. 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.
 - 9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

Attachments: Partial Waiver of Liens Form

REQUISITION FOR PARTIAL PAYMENT - WAIVER OF LIENS

PROJECT	OWNER	
GENERAL CONTRACTOR	SUBCONTRACTOR/VENDOR	
CONTRACT	WORK COMPLETE	
PROJECT:	CONTRACT -\$	
TRADE:	CHANGE ORDERS -\$	
CONTRACT -\$	TOTAL COMPLETE -\$	
CHANGE ORDERS -\$	RETAINAGE (%) -\$	
TOTAL CONTRACT -\$	LESS PRE. REQ\$	•
	THIS REQUISITION -\$	

Waiver of Lien

The undersigned, upon receipt of the above requisition payment hereby releases and discharges the Owner of and from any liability or obligation in any way related to or arising out of this project up to and including the date of this document.

The undersigned further covenants and agrees that it shall not in any way claim or file a mechanic's or other lien against the premises of the above designated project, or any part thereof, or against any fund applicable thereto for any of the work, labor, materials heretofore furnished by it in connection with the improvement of said premises.

The undersigned further warrants that, in order to induce the Owner to release this partial payment, they have paid all claims for labor, material, insurance, taxes, equipment, etc., employed in the prosecution of the work above, to date of this requisition.

The undersigned hereby releases and agrees to hold the Owner harmless from any and all claims in connection with the furnishing of such labor and materials, etc., for the construction of the aforementioned project.

The undersigned further guarantees that all portions of the work furnished and/or provided by them are in accordance with the contract and that the terms of the contract with respect to these guarantees will hold for the period specified in said contract.

IN WITNESS WHEREOF, we have executed under seal this release on the below date and to be legally bound hereby:

WITNESS:	_ FIRM:
BY:	DATE:

Orange-Ulster BOCES Emanuel Axelrod Special Education Center Additions & Alterations

CORPORATE ACKNOWLEDGEMENT	
State of)SS.	
)	
County of	
On the day of, before me came to me known and who by me being duly sworn did depose and say that he	
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; that he is the officer of the said executing the foregoing instrument, that he knows the seal of said corporation, the affixed to said instrument is such corporate seal, that it was so affixed by order of the Directors of said corporation and that he signed his name thereto by like order.	nat the seal ne Board of
Notary Public	
INDIVIDUAL ACKNOWLEDGEMENT	
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behalf of said partnership.	
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Notary Public	

012901-2

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General project coordination procedures.
 - 2. Conservation.
 - 3. Administrative and supervisory personnel.
 - 4. Project meetings.
 - 5. RFI's.

1.2 COORDINATION

- A. Coordination: 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 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 accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. If necessary, 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 Architect, Owner and separate contractors if coordination of their Work is required.
- C. 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. Progress meetings.

- 6. Preinstallation conferences.
- 7. Project closeout activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work.
- E. Use of the Site: The Architect will administer allocation of available space equitably among separate Prime Contractors and other entities needing access and space, so as to produce the best overall efficiency in performance of the total work of the project. Each contractor shall schedule deliveries so as to minimize space and time requirements for storage of materials and equipment on site.

1.3 SUBMITTALS

- A. Staff Names: Within 5 days of Notice to Proceed, 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 addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
 - 1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone.
- B. Company Safety Plan: Submit safety program including MSDS Management Plan for the Work of this Project.

1.4 REQUESTS FOR INFORMATION (RFI's)

- A. General: All requests for information or clarification shall be forwarded to the Architect. Contractor shall maintain a log of the status of each request shall be prepared to discuss outstanding items at each progress meeting.
- B. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.
 - 1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
 - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- C. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:

- 1. Project name.
- 2. Date.
- 3. Name of Contractor.
- 4. Name of Architect
- 5. Names of Trade/Specialty Contractors affected and coordinated with.
- 6. RFI number, numbered sequentially.
- 7. Specification Section number and title and related paragraphs, as appropriate.
- 8. Drawing number and detail references, as appropriate.
- 9. Field dimensions and conditions, as appropriate.
- 10. 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.
- 11. Contractor's signature.
- 12. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
 - Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.
- D. Hard-Copy RFIs; Prepare on the RFI Submittal Form included at the end of this Section.
 - 1. Identify each page of attachments with the RFI number and sequential page number.
- E. Software-Generated RFIs: Software-generated form with substantially the same content as indicated above.
 - 1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- F. Architect's Action: Architect will review each RFI, determine action required, and return it. Allow five working days minimum for Architect's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.
 - 1. The following RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals.
 - f. Incomplete RFIs or RFIs with numerous errors.
 - 2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.
 - 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be processed under "Changes to the Work" provisions in the General Conditions.

- a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response, unless otherwise established in the General Conditions.
- G. 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.
- H. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log bi-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 dropped and not submitted.
 - 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.

1.5 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. General: In addition to Project Superintendent, Contractor shall provide other administrative and supervisory personnel as required for proper performance of the Work
 - 1. Administrative and/or supervisory personnel 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.
 - 2. Include special personnel required for coordination of operations with other contractors.

1.6 PROJECT MEETINGS

- A. General: Architect will schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
 - 1. Attendees: Architect will inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Architect will notify Owner of scheduled meeting dates and times.
 - 2. Agenda: Architect will prepare the meeting agenda and distribute the agenda to all invited attendees.
 - 3. Minutes: Architect will record significant discussions and agreements achieved at all other meetings and will distribute the meeting minutes to everyone concerned, including Owner and Architect, within 3 days of the meeting.
- B. Preconstruction Conference: Architect will schedule 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. Conference will be held at Project site or another convenient location. Architect will conduct the meeting to review responsibilities and personnel assignments.

- Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
- 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing.
 - d. Designation of responsible personnel.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for processing Applications for Payment.
 - g. Distribution of the Contract Documents.
 - h. Submittal procedures.
 - i. Preparation of Record Documents.
 - j. Use of the premises.
 - k. Responsibility for temporary facilities and controls.
 - I. Parking availability.
 - m. Office, work, and storage areas.
 - n. Equipment deliveries and priorities.
 - o. First aid.
 - p. Security.
 - q. Progress cleaning.
 - r. Working hours.
- 3. Contractor shall submit the following items at this meeting:
 - a. Preliminary Contractor's Construction Schedule (if schedule has not yet been submitted).
 - b. List of Subcontractors.
 - c. Schedule of Values.
 - d. Submittal Schedule.
 - e. Products List (Proposed products and manufacturers including any substitution products proposed).
- C. Preinstallation Conferences: When required in the individual Specification Section, conduct a Preinstallation conference at Project site before each construction activity that requires coordination with other construction.
 - 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 in advance.

- 2. Contractor shall prepare agenda, preside at conference, record minutes, and distribute copies after conference to participants. 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 Change Orders.
 - d. Purchases.
 - e. Deliveries.
 - f. Submittals.
 - g. Review of mockups.
 - h. Possible conflicts.
 - i. Compatibility problems.
 - j. Time schedules.
 - k. Weather limitations.
 - I. Manufacturer's written recommendations.
 - m. Warranty requirements.
 - n. Compatibility of materials.
 - o. Acceptability of substrates.
 - p. Temporary facilities and controls.
 - q. Space and access limitations.
 - r. Regulations of authorities having jurisdiction.
 - s. Testing and inspecting requirements.
 - t. Required performance results.
 - u. Protection of construction and personnel.
- 3. Record significant conference discussions, agreements, and disagreements.
- 4. 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: Architect will conduct progress meetings at weekly intervals, or as needed in the temporary field office at the Project site.
 - 1. Architect will preside over these meetings.
 - 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 conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - a. A representative of Contractor shall be present at every progress meeting, regardless of whether or not that Contractor is performing work at the site at the time.
 - b. Any decision reached at a job meeting shall be binding on a Contractor, whether or not he or his representative is present at such job meeting.

- 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.
 - 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 utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Change Orders.
 - 14) Documentation of information for payment requests.
- 4. Reporting: Architect will distribute minutes of the meeting to each party present and to parties who should have been present and will include a brief summary, in narrative form, of progress since the previous meeting and report.
 - 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. Coordination Meetings: Architect will conduct Project coordination meetings at intervals required by the Construction Documents. 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 conference 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.

- 3. Any decision reached at a job meeting shall be binding on a Contractor, whether or not he or his representative is present at such job meeting
- 4. Reporting: Architect will 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

ATTACHMENTS: RFI SUBMITTAL FORM

REQUEST FOR INFORMATION (RFI FORMAT)

Contractor:		Architect: KG&D Architects, PC		
Address:		Address: 285 Main Street, Mt. Kisco, NY 10549		
Telephone:		Telephone: 914-666-5900		
Fax:		Fax: 914-666		
Email:		Email: Bmangan@kgdarchitects.com		
Project Name:		Project Location:		
RFI Number:	Date of Request:	Requested Date of Response (5 business days		
	,		ose date Feb 26, 2021):	
Description, complete with ba	and as necessary alla	onou nereto.		
Sketches of Conditions	Specification Paragraph Reference(s):	1	Drawing Reference(s):	
Proposed Solution:				
Cost Impact:		Time Impact:		
Trade/Specialty Contractors	Affected:			
Trade/Specialty Contractors (Coordinated With:			
Submitted By:				
Architect's Response:				
Ву:		Date of Resp	onse:	

SECTION 013115 - COORDINATION DRAWINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes preparation of coordination drawings for architectural, structural, mechanical, plumbing, fire protection, fire alarm, lighting, information technology, security, and electrical Work.
- B. Related Sections include the following:
 - 1. Division 01 Section "Project Management and Coordination" for administrative provisions for coordinating construction operations.
 - 2. Division 01 Section "Closeout Procedures" for project record drawing requirements.
 - 3. Division 21, 22, 23, 26, 27 and 28 for additional requirements.

1.2 DEFINITION AND INTENT

- A. The Contract Drawings (mechanical, plumbing, and electrical plans) are diagrammatic only and are not intended to show the alignment, exact physical locations, or configurations of such Work. Performance by the Contractor shall be required to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results. Where possible, the Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents before commencing coordination drawings.
- B. Coordination drawings are drawings prepared by Contractor that superimpose Work of multiple trades involved in the construction process. Coordination drawings indicate systems and components to be installed by the Contractor to maximize clear height and free area in ceiling cavities, allow for proper and adequate equipment service clearances, minimize space required by shafts and chases and provide the most efficient functioning and use of materials possible while complying with the final performance and finished appearance required by the Contract Documents.
- C. Coordination drawings are intended to show the relationship and integration of different construction elements that require coordination during fabrication or installation to fit in the space provided, to function as intended, and to present the intended final finished appearance.
- D. Coordination Drawings are not a replacement for shop drawings specified in the technical specifications or the Record Drawings required in Division 01.
- E. The Contractor shall manage the process so that each trade/ sub contractor provides all required information in a timely manner. Coordination Drawings may be completed on a phased basis so as not to delay the overall project schedule. The CPM Schedule

specified elsewhere in Division 01 Section "Construction Progress Documentation" shall include the submission of Coordination Drawings. The same shall demonstrate how the Contractor intends to integrate the submission of Coordination Drawings to suit the overall project schedule. The Contractor shall pay all costs for reproducing copies of coordination drawings for use in the field.

F. Contractor shall maintain equipment access and pathways as indicated on the Drawings. Floor space in equipment rooms shall be maintained as indicated on the Drawings. Contractor shall clearly indicate access and floor space to be maintained in coordinated shop drawings submitted to the Owner and Architect as per the Specifications

1.3 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

A. Refer to Division 01 Section "Submittal Procedures" for availability of and use of Architect's CAD Background Drawings.

1.4 SUBMITTALS

- A. Coordination Drawings: Prepare and submit as informational submittal within 15 days of Notice to Proceed.
- B. Submit coordination drawings in the same manner as shop drawings; refer to Section 013300 Submittal Procedures.

1.5 PROJECT CONDITIONS

- A. Maintain marked up set of coordination drawings at Project site available for reference by Owner and Architect.
- B. Maintain original CAD drawings or base drawings used to produce coordination drawings updated with revisions to reflect actual construction. Make drawing revisions at time of change to construction; Transfer information to CAD drawings no later than every 7 days.
- C. Failure to submit coordination drawings will result in no changes to contract sum for necessary corrections to uncoordinated work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARATION OF COORDINATION DRAWINGS, GENERAL

A. Prepare coordination drawings for Project using CAD drawings or similar coordination documentation overlay drawings indicating coordination of the project.

- B. CAD Drawings: Produce coordination drawings and overlays using Architect's electronic base drawings furnished by the Architect.
 - Each trade shall be assigned a layer to create the detailing work of each section
 or division of the Specifications requiring coordination. The Contractor shall
 ensure that the layer assigned to one trade cannot be modified by another trade,
 and that the final product clearly differentiates which trade is responsible for the
 respective information shown. The latter may occur through the use of colors or
 other distinct graphic methods.

3.2 INFORMATION REQUIRED IN COORDINATION DRAWINGS

- A. Architectural Work Information Required in Coordination Drawings:
 - 1. Items which are recessed into ceilings and ceiling plenums, or surface mounted to ceilings.
 - 2. Anchorages, fastenings, and supporting for items recessed in, attached to, or suspended from ceilings or structure above ceilings.
 - 3. Firewalls, Fire Barrier, Fire partitions and smoke partitions on coordination drawings for coordination of life safety requirements.
- B. Plumbing Work Information Required in Coordination Drawings:
 - 1. Sizes and bottom elevations of piping with insulation thickness included.
 - 2. Dimensions of major components, such valves, access doors and cleanouts.
 - 3. Fire-rated enclosures around piping
 - 4. Support of all roof mounted plumbing piping and equipment.
 - 5. Required space to install, service and maintain all plumbing mechanical items and systems.
- C. HVAC Work Information Required in Coordination Drawings:
 - 1. Sizes and bottom elevations of ductwork, piping with insulation thickness included.
 - 2. Fire dampers.
 - 3. Acoustical lining in ductwork.
 - 4. Identification of ductwork pressure class.
 - 5. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - 6. Fire-rated enclosures around ductwork.
 - 7. Support of all roof mounted HVAC piping and equipment.
 - 8. Required space to install, service and maintain all HVAC items and systems.
- D. Electrical Work Information Required in Coordination Drawings:
 - 1. Electrical Work, including telecommunications, data, security, lighting and fire alarm systems.
 - 2. Runs of vertical and horizontal conduit 1 inch diameter and larger.
 - 3. Light fixture locations.

- 4. Emergency egress light locations.
- 5. Smoke detector, and other fire alarm device locations.
- 6. Panelboard, switchboard, transformer, cable tray, and motor control center, and exit signs.
- 7. Location of pull boxes and junction boxes, dimensioned from column center lines.
- 8. Bottom elevation of all conduit runs 1-1/4 -inch diameter and larger and of all cable trays.
- 9. Support of all roof mounted conduit and photovoltaic equipment, cameras, and security system devices.
- 10. Required space to install, service and maintain all electrical items and systems.
- 11. Lightning protection.

E. Structural Work Information Required in Coordination Drawings:

- 1. Ceiling system.
- 2. Openings and sleeve locations required in slabs, walls, beams and other structural elements, including required openings not indicated on Contract Documents.
- 3. Slab edge locations and locations of sleeves dimensioned from building lines and floor lines.

F. Ceiling Systems and Plenum Space in Coordination Drawings:

- 1. For mechanical, plumbing, fire alarm, electrical, controls, and telecommunications Work penetrating acoustical ceilings, show locations of each item (including sprinkler heads, diffusers, grilles, access doors, light fixtures, smoke detectors, exit signs, speakers, and other visible ceiling mounted devices) relative to acoustical ceiling grid or to wall in gypsum board ceilings.
- 2. Locate components within ceiling plenums to maximize clear area for future installations of lights and equipment.
- 3. Clearly indicate areas of conflict between light fixtures, diffusers and grilles and plenum boxes and other components on coordination drawings.
- 4. Draw elements to dimensions appropriate for products to be installed. Use of symbols is not acceptable.

3.3 TRADE CONFLICTS IN CAD DRAWINGS AND OTHER OVERLAY DRAWINGS

A. The General Construction Contractor shall review the Coordination Drawings and indicate areas of Architectural, Equipment, Structural and other conflicts and obstacles and coordinate locations of rated and exterior walls to assure their continuity and closure as specified. The each trade Contractor shall determine that all work can be installed without interference. In the case of unresolved interference, the General Contractor shall notify the Architect. The Architect will then suggest to the General Construction Contractor as to how to revise the Drawings to eliminate interference. The General Construction Contractor shall then have the trade(s) revise their respective Drawings to eliminate the interference.

1. Each Contractor or trade shall approve the Coordination drawings in writing indicating approval of installation coordination and clearances

3.4 PREPARATION OF COORDINATION DRAWINGS

- A. Organize coordination drawing submittals as follows:
 - 1. Floor Plans: Provide floor plans and reflected ceiling plans for all floors. Show architectural, structural, mechanical, plumbing, fire protection, fire alarm, electrical, and telecommunications elements on floor plans and reflected ceiling plans.
 - 2. Equipment Rooms and Spaces: Provide large scale drawings for equipment rooms and spaces showing plans and elevations of mechanical, plumbing, fire protection, electrical, and telecommunications equipment.
 - 3. Structural Penetrations: Provide coordination drawings for each floor indicating penetrations and openings required for all trades.
 - 4. In public and occupied areas without scheduled finish ceilings, appearance is a major coordination factor. Reposition proposed locations of work after Coordination Drawing review by the Architect. Provide adjustments to the exact size, location and offsets of ducts, pipes, and conduit to achieve reasonable appearance objectives. Provide these adjustments as part of the Contract or notify the Architect immediately as to why the adjustment cannot be made.
- B. Prepare coordination drawings to a scale of 1/4" = 1'- 0" or larger (1/2"= 1'-0" for mechanical room plans); detailing major elements, components, and systems of mechanical 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 necessarily limited to) the following:
 - 1. Detail complex areas at larger scale than typical floor plans.
 - 2. Use a common architectural layout as background.
 - 3. Indicate ductwork, pipes with 6-inch diameter and greater, and conduits with 3-inch diameter and greater by double lines. Use single lines for smaller mechanical piping and all electrical conduits. Draw piping, ductwork, lighting fixtures, and cable trays in scale.
 - 4. Circle and clearly note deviations from Contract Documents with reason for deviation stated.
 - 5. Provide name of representative of each subcontractor whose Work is indicated on coordination drawings, verifying their review and approval that their Work has been coordinated with each other trade and with architectural and structural Work.

END OF SECTION 013115

SECTION 013200 - SCHEDULING AND PROGRESS

1.1 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the General Conditions and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.

1.2 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Preliminary Requirements
- B. Commencement, Prosecution and Completion of the work
- C. Submittal Schedule
- D. Project Progress Schedule
- E. Breach of Contract
- F. Time of Completion

1.3 PRELIMINARY REQUIREMENTS

- A. Within three (3) working days after bids are opened, and before the Contract is executed, the three (3) apparent low bidder for each trade/contract must submit to the Architect, in writing, a list of duration's and a sequence, in the form of a bar chart, for all activities that are the responsibility of the bidder. Contractor's proposed work force and other resource loading for each activity of the bar chart, broken down by trades, must also be provided. Failure to comply with this requirement may be cause for rejection of the bid.
- B. The apparent low bidders, concurrent with the submission of bar chart, shall also submit to the Architect, in writing, the following information:
 - 1. Shop drawing and material sample schedules keyed to the duration's submitted in the bar chart. (See Section 01 33 00)
 - 2. Schedules for the award of subcontractor and equipment contracts keyed to the duration's submitted for the bar chart.
 - 3. The name of the person who, as Scheduling Coordinator for the apparent low bidder, is authorized to act on behalf of the apparent low bidder on all matters of scheduling included in this Section. Once named, the Scheduling Coordinator may only be replaced after written notice is given to the Owner's Representative and Architect. The Contractor agrees, upon the request of either of the two parties, to replace the Scheduling Coordinator.
- C. Failure to comply with this subsection 1.03 of this Section of the General Requirements may be cause for rejection of the bid and forfeiture of security.

1.4 COMMENCEMENT, PROSECUTION AND COMPLETION OF THE WORK

A. Contractor shall commence work under this contract upon receipt by him of Letter of Intent to Award, Notice to Proceed, and/or

Execution of the Contract and shall prosecute said work diligently and complete the work within the stated calendar days for each portion of the work as set forth in Section 01 10 00.

- B. The time stated for completion for contract work includes final cleanup of area. Upon completion of total Contract work, ALL AREAS SHALL BE CLEAN.
- C. The Contractor is to carry on responsibility for services and maintenance of such items as temporary roads, walks, ramps, field offices, parking areas, environmental controls and the like until work under this contract is complete, unless otherwise directed by the Owner. Coordinate work herein with Section 01 10 00, Description of Work.

1.5 SUBMITTAL SCHEDULE

- A. Within two (2) weeks after receipt of Letter of Intent to Award, Notice to Proceed, and/or Execution of the Contract, the General Contractor shall prepare a detailed listing of all items to be incorporated within the work, including all items of mechanical and electrical. This information will be incorporated in the "PPS" as prepared by the "General Contractor" in accordance with Paragraph 1.6 of this Section. Listing should generally include the following:
 - 1. Overall project milestones
 - 2. Proposed products list and statue report on material orders
 - 3. Dates of shop drawing/sample submittals
 - 4. Guaranteed delivery dates after shop drawing and/or sample approvals
 - 5. Date of installation start
 - 6. Date of installation completion

1.6 PROJECT PROGRESS SCHEDULE

A. Within two (2) weeks after receipt of Letter of Intent to Award, Notice to Proceed, and/or Execution of the Contract, but prior to the actual start of the field work, the Contractor shall submit to the Architect for his approval the proposed Project Progress Schedule giving the information listed below.

The minimum information contained within the required project progress schedule shall consist of:

- 1. The estimated dates the various classes of work included in the Schedule of Values will be started and completed.
- 2. The estimated percentages of completion to be obtained and the total dollar value of the various classes of said work projected to the end of each calendar month until substantial completion. Calculations shall be based upon work in place; materials on site and not installed; materials fabricated and stored under suitable conditions and insured to full value in a manner satisfactory to Architect and Owner; and such other items as may be agreed to among the Contractor, Architect and Owner.
- 3. The estimated delivery and installation dates of the major pieces of equipment to be furnished and installed by the Contractor.
- 4. The estimated projected progress of work that will be performed away from the job site.
- 5. A delineation of the work that will be performed by the Contractor's

own forces and by his Subcontractors.

- 6. The estimated calendar dates on which all the work under the contract will be completed and ready for substantial completion and final inspections.
- B. The Project Progress Schedule shall be based on an orderly progression of the Work, allowing adequate time for each operation, and leading to a reasonable certainty of Substantial Completion by the date established in Section 01 10 00.

The schedule will be reviewed by the Architect and Owner's Representative for compliance with the requirements of this article and will be accepted by them or returned to the contractor for revision and resubmittal.

<u>Unless specifically required by law, no payment under this Contract shall be due until the Progress Schedule has been submitted to the Architect and Owner's Representative and approved by both parties.</u>

C. As the work progresses, an up-to-date copy of the schedule with the actual percent completion of the various classes of the work indicated in red shall be submitted by the contractor to the Architect and/or Owner's Representative during the first week of each calendar month. (Distribution to be established as part of "preconstruction meeting").

The schedule may be adjusted and revised to meet unforeseen job conditions, but such changes shall, at all times, be approved by the Architect and the Owner's Representative in writing.

D. A copy of the schedule shall be available at all times at the job site for the inspection and guidance of other Contractors, Subcontractors and Vendors engaged on any construction phase of the project.

It shall be the responsibility of Each Contractor to ascertain that all his Subcontractors, Vendors and Material men periodically consult the Schedule so that their work schedule shall be maintained in conformance with his own.

It shall also be the responsibility of Each Contractor to periodically consult the Job Progress Schedules of any other Contractors that may be engaged on any separate construction of the project, so that undue delay in progress on their part shall not delay the work of the other Contractors.

E. AN UP TO DATE COPY OF PROJECT PROGRESS SCHEDULE MUST BE ATTACHED TO MONTHLY REQUISITION IN ORDER FOR PROCESSING TO BEGIN.

INCOMPLETE REQUISITIONS WILL BE REJECTED.

1.7 BREACH OF CONTRACT

A. In addition to the Owner's right to terminate the contracts as set forth in the Contract Documents, including Article 17 of the General conditions; the

Contractor's failure to comply with any requirement called for in subsections 1.04, 1.05 and 1.06 above shall constitute a material breach of the Contract, and the Owner shall have the right to and may terminate the Contract, provided, however, that the failure of the Owner to so terminate shall not relieve the Contractor from future compliance.

- 1.8 TIME OF COMPLETION Coordinate with Contract and General Conditions and Section 01 10 00.
 - A. Notwithstanding the implementation of the Construction Schedule, it is the sole responsibility of the Contractor to complete the Work within a Contract Time which will assure the substantial completion of the Project by the required date.

End of Section

SECTION 013300 - SUBMITTAL REQUIREMENTS

NOTES:

- SUBMISSIONS CAN BE MADE ELECTRONICALLY PROVIDED THAT SAID SUBMISSIONS FOLLOWS THE CRITERIA OUTLINED HEREIN AND BOTH THE FORMAT FOR THE OVERALL PROCESS IS AGREED TO BETWEEN ALL PARTIES PRIOR TO INITIAL START OF THE PROJECT.
- SUBMITTAL TRANSMISSIONS SHALL BE LIMITED TO THE TECHNICAL PRODUCT AND DRAWING REQUIREMENTS ONLY. MSDS DATA SHALL NOT BE TRANSMITTED AS AN INTEGRAL PART OF THE SUBMITTAL BUT SHALL BE INCLUDED AS A SEPARATE DOCUMENT FOR THE EXPRESS PURPOSE OF ASSEMBLING THE REQUIRED FIELD MANUAL AS SPECIFIED HEREIN.
- ALL SUBMITTALS SHALL BE MADE THROUGH THE SUBMITTAL EXCHANGE PROCESS – EMAIL TRANSMITTAL OF SAME WILL NOT BE ACCEPTED AND WILL BE RETURNED WITHOUT REVIEW.
- ALL COSTS INVOLVED WITH THE IMPLEMENTATION AND MAINTENANCE OF THE SUBMITTAL EXCHANGE WILL BE DEEMED AT THE SUBMITTING CONTRACTOR'S EXPENSE.

1.1 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the General Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Definitions as apply to "Contractors" involved with the work of this Project shall be as set forth in Section 01 10 00, Article 1.01.
- D. Where practical, submittals shall be made in groupings where installations are complimentary. *Failure to comply with this requirement will be cause for rejection of any or all submittals*.

Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

E. The Contractor is encouraged to submit for approval products made from recycled and/or environmentally responsible material. Every effort will be made by the Design Professional Team to approve these materials; the substitution request procedure shall still be enforced.

1.2 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Related Work Specified Elsewhere.
- B. Approved Equal Clause/Substitutions/Options
- C. Certification.
- D. Manufacturer's Instructions

- E. Submittal Instructions
- F. Shop Drawings
- G. Samples
- H. Material Safety Data Sheet (MSDS) Submittals
- I. Proposed Products List and Status Report on Material Orders
- J. Scheduling of Submittals
- K. Job Progress Schedule
- L. Coordination Drawings
- M. Progress Photographs
- N. Certificates
- O. Construction Waste Management Procedures and Certifications See Section 01 74 19.
- P. V.O.C. Compliance certification See individual technical sections.

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. 01 29 00 Applications for Payment and the Schedule of Values
- B. 01 32 00 Scheduling and Progress
- C. 01 33 00 Photographic Documentation
- D. 01 43 26 Testing Laboratory test and inspection reports
- E. 01 77 00 Project Closeout requirements
- F. 01 77 19 Project Record Documents
- G. Divisions 2 through 33 Sections for specific requirements for submittals in those Sections

1.4 CERTIFICATION

- A. Certification of compliance with specification performance standards and manufacturers' specifications and directions shall be furnished for any portion of this work for which specific performance requirements and/or manufacturers' specifications are listed. It shall be the responsibility of the Contractor to secure two (2) copies of each certification when required and transmit same to the Architect.
- B. Sample Certification Form (2 pages) Section 01 33 06 as an exhibit at the close of this Section. Each item requiring certification shall be so noted and affidavits shall be filed singly to cover each specified material, installation, application and the like. CERTIFICATIONS SHALL BE SUBMITTED AS PART OF THE CLOSE OUT DOCUMENT REQUIREMENTS SET FORTH IN SECTION 01 77 00.

1.5 MANUFACTURER'S INSTRUCTIONS

A. Where in these specifications an item is called for to be installed in accordance with the manufacturer's directions, specifications or recommendations, the Contractor shall furnish the Architect with two (2) printed copies of said directions, specifications or recommendations, before the item is installed.

1.6 SUBMITTAL INSTRUCTIONS

A. Transmit each submittal, except sample installations and sample panels to the Architect. Transmit submittals with Submittal Cover Sheet attached as Section 01

33 02. On the Cover Sheet identify Contractor, indicate date of submittal, and include information prescribed by form and required in paragraph entitled, "Submittal Requirements" of the individual technical Section and as follows. Process transmittal forms to record actions regarding sample installations and panels.

1.7 SHOP DRAWINGS

- A. The following serves as a further definition of the requirements for shop drawing submittals as covered in Article 6(Y) of the General Conditions:
 - 1. The Contractor shall submit to the Architect with such promptness as to cause no delay in the work, layout, detail, schedule, setting, product data and shop drawings for each part of the work as specified or required.
 - a. Submission of data for review by the Structural and Mechanical/Electrical Engineers shall be sent directly to those Engineers with duplicate transmittals sent to the Architect.
 - 2. BEFORE SUBMITTING ANY DATA FOR APPROVAL, THE CHECK CONTRACTOR SHALL THE SUBMITTALS OF ALL SUBCONTRACTORS FOR ACCURACY **AND** CONTRACT COMPLIANCE. ALL SUBMITTALS SHALL BE UNDER THE COVER SHEET ATTACHED HERETO. SUBMITTALS NOT COMPLYING WITH THE ABOVE SHALL BE RETURNED TO THE SUBMITTING CONTRACTOR WITHOUT EXAMINATION BY THE ARCHITECT. Contractor shall see that all work contiguous with and having bearing on work indicated on drawings is accurately and distinctly illustrated and that work shown is in conformity with contract requirements.
 - 3. Shop drawings shall be numbered consecutively and shall represent:
 - a. All working and erection dimensions.
 - b. Arrangement and sectional views.
 - c. Necessary details, including information for making connections to other work.
 - d. Kinds of materials and finishes. Colors, where applicable
 - 4. Shop drawings shall be dated, and shall generally contain:
 - a. Name and Number of project.
 - b. Name, address and telephone number of submitting Contractor.
 - c. Description of required equipment, materials, and classification item numbers.
 - Locations at which materials or equipment are to be installed in the Work
 - e. Identification of drawings, schedules, notes and/or details and_ specification sections and related paragraphs/articles to which they apply.
 - f. Equipment or fixture identification corresponding to that used in Contract Documents.
 - g. Accessories and special or non-standard features and materials which are being furnished.
 - h. Properly marked with external connection identification as related

to the project where they consist of standard factory assembly or field installation drawings.

In addition to the general data required above, mechanical and electrical submissions shall contain:

- a. Manufacturer's specifications including materials of construction, metal gauge, thickness and finish.
- b. Certified dimensional drawings including clearances required for maintenance or access (coordinate with Section 01 31 14)
- c. Performance data, ratings, operating characteristics, and operating limits.
- d. Electrical ratings and characteristics.
- e. Wiring and control diagrams, where applicable.
- f. Certifications requested, including UL label or listing.
- g. List of accessories which are required but are NOT being provided by the product manufacturer or are NOT being furnished under this Section. Identify the Section(s) under which the accessories are being furnished.
- 5. Submission of data for approval shall be accompanied by letter of transmittal, in duplicate, containing the name of the project, Contractor's name, number of drawings, titles and other pertinent data.
- 6. Procedure for Submitting Shop Drawings and Product Data

7.

a. After completion of checking, the Architect, and Engineer (as appropriate) will retain one print for his record and return the remaining copies to the submitting Contractor.

The average "turnaround time" of any one in-house submittal by the Architect shall not exceed 15 business days for review and at least 20 business days when another consultant is involved.

For drawings returned "Resubmit," "Amend & Resubmit,"
 "Disapproved" or "Rejected-Resubmit," the original drawings shall be corrected, and resubmitted until final approval.

<u>NOTE</u>: The Owner reserves the right to backcharge the Contractor for the additional costs beyond the review of any resubmittal.

c. For drawings returned "Approved", "No Exceptions Taken", "Approved as Noted", and "Make Corrections Noted", the Contractor shall obtain and provide sufficient prints as required for the field.

Note: It is the responsibility of the Contractor to confirm all dimensions,

quantities, and the coordination of materials and products supplied by him with other trades. Approval of shop drawings containing errors does not relieve the contractor from making corrections at his expense.

- 8. No work as called for by shop drawings shall be done until Architect's approval.
- 9. IF SUBMITTALS SHOW VARIATIONS FROM CONTRACT REQUIREMENTS BECAUSE OF STANDARD SHOP PRACTICES, OR OTHER REASONS, CONTRACTOR SHALL MAKE SPECIFIC MENTION OF SUCH VARIATION IN HIS LETTER OF TRANSMITTAL.
- 10. APPROVAL OF SHOP DRAWINGS IS GENERAL. IT SHALL NOT RELIEVE CONTRACTOR OF THE RESPONSIBILITY FOR ACCURACY OF SUCH DRAWINGS, NOR FOR THE FURNISHING OF MATERIALS OR PROVISION OF WORK REQUIRED BY THE CONTRACT AND NOT SHOWN ON THE SHOP DRAWINGS.

Unless it is an interpretation of design intent, approval of shop drawings shall not be construed as approval of departures from Contract.

- 11. <u>If the Contractor should alter any information on previous submittals, besides the notations called for by the Architect, he must circle this new information to bring it to the Architect's attention.</u>
- 11. Where practical, in submitting data for approval, all associated drawings, product data and the like, relating to a complete assembly shall be submitted at one and the same time so that each may be checked in relation to the entire proposed assembly.

PARTIAL SUBMISSIONS WILL BE RETURNED WITHOUT ACTION TAKEN. EXTRANEOUS MATERIAL ON PRODUCT DATA SHEETS SHALL BE STRUCK PRIOR TO SUBMITTAL.

Resubmittals of any data shall be "complete", i.e. – Lighting Fixture resubmittal shall include all fixtures whether or not some have been approved so that when the entire submittal is approved, a full record copy is on file.

12. Contractor shall have copies of all approved shop drawings as listed in Paragraph 1.06.A.6 above on the job at all times and shall make them available to the Architect or the Owner's representatives.

1.8 SAMPLES

- A. The following serves as a further definition of the requirements for sample submittals as covered in Article 6(Y)of the General Conditions:
 - 1. Names of proposed manufacturers, materialsmen and dealers who are to furnish materials, fixtures, appliances or other fittings shall, where practical, be submitted to the Architect for early approval to afford proper investigation and check.

- No manufacturer will be approved for any materials to be furnished under this contract unless he shall be of good reputation and shall have plant of ample capacity and shall have successfully produced similar products.
- 3. All transactions with manufacturers and subcontractors shall be through the Contractor.
- 4. Unless otherwise specified, samples shall be in duplicate (2) and of adequate size to show quality, type, color, range, finish, texture, etc. Deliver one (1) sample to field office and one (1) sample to Architect's office unless otherwise directed.
- 5. Each sample shall be labeled, bearing material and quality names, submitting Contractor's name, and project name, and other pertinent data.

In accordance with OSHA regulation Number 1910.1200. a Material Safety Data Sheet (MSDS) shall be submitted for each product to be incorporated in the work.

The sole purpose for requiring submittal of MSDS sheets as outlined herein and respective technical sections is to advise the Contractor that health and safety is of primary importance to the execution of the work and for the future occupants of the project under construction. It is to be assumed, and will be enforced, that the submission of MSDS sheets be made as a separate package, covered by its own transmittal and marked "for evidence of legal compliance". This submission will be noted and returned with a stamp indicating "SUBMITTED INFORMATION ONLY, NOT REVIEWED".

Failure to observe these submittal requirements will be cause for rejection of the entire submittal.

The safe handling of products by the applicator according to MSDS warnings is a safety issue, like any other, entirely within the purview of the Contractor.

- 6. Where Specifications require manufacturer's printed installation directions, such directions and diagrams shall accompany samples. Coordinate with Paragraph 1.05 herein
- 7. A duplicate letter of transmittal from the submitting Contractor requesting approval of the sample shall accompany the samples.
- 8. Transportation charges to designated locations must be prepaid on all samples.
- 9. Materials shall not be ordered until approval is received in writing from the Architect. All materials shall be furnished equal in all respects to the samples which were approved.

1.9 MATERIAL SAFETY DATA SHEET (MSDS) SUBMITTALS

- A. As specified in Paragraph 1.07 of this Section and within the technical sections forming this Specification, the Contractor is directed to the following requirements concerning "MSDS" submissions.
 - 1. Submit MSDS's for all products used during construction whether incorporated within the work or used in the performance of the work.
 - 2. Identify which products may be harmful to construction workers or other building occupants.
 - 3. Develop means and methods for protection of construction workers and other building occupants from potentially harmful products. **Submit** said means and methods to the Owner for review and approval.
- B. Further, the Contractor with assistance from each individual contractor shall maintain a "MSDS" file on site, accessible to workers and otherwise in compliance with jurisdiction's "Right To Know" legislation.
- C. Attention is directed Section 01 77 00, Article 1.04.A.5 for final closeout submittal of MSDS compilation to the Owner.

1.10 CERTIFICATES

- A. Submit a Summary of Solid Wastes Generated, manifests, weight tickets, and the like in accordance with requirements of Section 01 74 19 Construction Waste Management.
- B. Submit, as required by each technical section a certification for V.O.C. compliance.

End of Section

CONTRACTOR REQUEST FOR ELECTRONIC DRAWING FILES

The Architect, for the convenience of the Client/Owner, has electronic copies or representations of Drawings, Specifications and Project Manuals. Requests for electronic copies of such Drawings, Specifications and Project Manuals by the Contractor, for the Contractors use or the use of Subcontractors, shall be made in writing to the Client/Owner as outlined hereinbelow and shall outline the benefit derived from such a request. The Contractor shall be prepared to reimburse the Client/Owner for any costs involved in preparing such electronic documents for the Contractors use.

Architect's Project Number:	
Project Name:	
Architect:	
Client/Owner:	
Contractor/Recipient's Name:	
Attention to:	
Contractor/Recipient's Address:	
Date of Request:	
Date of Release:	

As requested, attached is a list of electronic drawing files. For the release of these electronic drawing files to the recipient, the following items shall be understood, acknowledged and signed by the authorized personnel of the recipient with the fee included.

- A. The electronic drawing files are the property of the Architect and the Contractor is granted a license to use the electronic files only in connection with the subject project.
- The electronic drawing files do not necessarily represent the Contract Documents В. associated with the referenced project. These files are solely for the use of the recipient and are not a representation of the scope of work for the project. Any use by contractors, subcontractors or fabricators shall be on all of the same terms and conditions being applicable to such users who shall acknowledge the same in writing. The Recipient may use the electronic drawing files only. Electronic drawing files or portions thereof, shall not be provided to anyone else without the written approval of the Client/Owner. The use of the electronic drawing files, documents and any reprographics shall not identify any member of the Architect or Architect's consultants or sub- consultants or the Client/Owner without the written approval from the parties.
- C. The entire risks as to the results and performance of the package including the

the Contractor/recipient. The electronic drawing files. assumed by are Client/Owner, the Architect and the Architect's consultants and sub-consultants, including directors, employees, representatives, and licensors of the company, shall not have any liability to the Contractor/recipient or any other person or entity for any direct, indirect, incidental special or consequential damages whatsoever, including, but not limited to, the loss of revenue or profit, lost data, or any other personnel, commercial or economic loss, and claims by third parties. Even if the Client/Owner and Architect and the Architect's consultants and sub-consultants has been advised of the possibility of such damages; said Client/Owner and Architect and the Architect's consultants and sub-consultants shall not be held liable as stated above.

- D. The Contractor/recipient hereby agrees to indemnify and hold the Client/Owner, the Architect and the Architect's consultants and sub-consultants harmless from and against any cost, damage, liability, loss or claim arising from violation of this license. The Contractor/recipient and all subcontractors of all tiers also agrees that, in addition to all other remedies hereunder, the Contractor/recipient and such parties grant the Client/Owner the right to seek injunctive or other equitable relief to prevent the violation or require the performance of any of the Contractor's/recipient's obligations under this license, and the Contractor/recipient hereby consents to the issuance of such relief by any court of competent jurisdiction without the need to post any bond or security.
- E. The electronic files requested are as follows:

Electronic file name	Corresponding Drawing (close approximation)
1.	
2.	
3.	
Etc.	
Total number of files:	

CONTRACTOR'S/RECIPIENT'S AGENT SIGNATURE:
NAME IN BLOCK LETTERS:
AUTHORIZED POSITION HELD:
DATE OF SIGNATURE:

End of Section

SUBMITTAL COVER SHEET

Contract	or:						
Address	:				Telep	hone: <u>()</u>	
	Owner: Duto	chess Count	y BOCES				
	Name of Pro	ject: DC BO	CES Distri	ct Wide Axelrod	Project		
TYPE OF	SUBMITTAL						
☐Shop D		<u>-</u>	∐Sch	edule		☐Physical Sar	nple
☐Technic			=	tificate ranty		☐Color Sampl	e
Submis	sion #: 1st	2 nd 3 rd	4 th (circ	cle one)			
Descrip	otion:						
Product	Identification:						-
Manufa	cturer:						-
							-
				ENCES: (Must b			-
Spec Se	ection No.:			Drawing No	(s):		_
Paragra	aph:			Rm. Or Det.	No(s):		_
Contractor	r Remarks:			Contractor Sub	mittal Review	Stamp_	
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				KG+D ARCHITEC	·		
				DATE	BY		

CERTIFICATION OF SPECIFICATION COMPLIANCE

I/WE, 1	the MANUFACTURER/SUPPLIER and INSTALLER of
-	ecified in Section Numberof the Contract Documents prepared by KG+D ects, PC, 285 Main Street, Mount Kisco, NY, 10549, for the:
	Dutchess BOCES Campus Wide Water Project
	SED No: 13-90-00-7-999-004
do (do	es) herein certify that -
1.	All materials furnished for said project do fully comply with all specification requirements as stated within the Contract Documents;
2.	That no asbestos containing materials of any nature are used in the work;
3.	That execution of the Work covered by this certification has been performed in accordance with the drawings prepared by the design professional team.
CONT	RACTOR:
CERT	IFICATION BY: TITLE:
ADDR	ESS:
CERT	IFICATION DATED:
Distrib	ution:
Origina	al and One Copy to: KG+D Architects, PC 285 Main Street

Mount Kisco, NY 10549

CERTIFICATION OF SPECIFICATION COMPLIANCE

COR	PORAT	E ACKNOWLEDGEMENT
State Coun)SS.)
On	the	day of, before me came to me known and who by me being duly sworn did depose and say that he
is su	ıment, t ch corp	that he is the officer of the said corporation executing the foregoing hat he knows the seal of said corporation, that the seal affixed to said instrument orate seal, that it was so affixed by order of the Board of Directors of said and that he signed his name thereto by like order.
INDI\	VIDUAL	Notary Public ACKNOWLEDGEMENT
State Coun)SS.)
		day of, before me came
On rosida	the	to me known and who by me being duly sworn did depose and say that he
reside	es at <u> </u>	that he is the individual who executed the foregoing instrument. Notary Public
PAR	TNERSI	HIP ACKNOWLEDGEMENT
State Coun)SS.)
On	the	day of, before me came
reside firm	es at of	to me known and who by me being duly sworn did depose and say that he that he is the partner in the doing business under the name of
of sa	id partne	and that he executed the foregoing instrument on behalf ership.

Notary Public

SECTION 013529 - HEALTH AND SAFETY PLAN

PART 1 – GENERAL

1.1 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the General Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Definitions as apply to "Contractors" involved with the work of this Project shall be as set forth in Section 01 10 00.

1.2 REQUIREMENTS INCLUDED IN THIS SECTION

- A. Provide all labor, equipment and materials and perform all operations in connection with monitoring air quality, decontaminating equipment and providing worker health and safety protection for all Contractor and Subcontractor personnel.
- B. Develop a site-specific Health and Safety Plan (HASP) specifically addressing the potential hazards that may be encountered. This plan shall meet all Occupational Safety and Health Administration (OSHA) requirements.
- C. Review the requirements and data presented and supplement the program with any additional measures deemed necessary to fully comply with regulatory requirements and adequately protect personnel on the site.

1.3 REFERENCES

- A. OSHA Regulation 29 CFR 1910.120
- B. OSHA Regulation 29 CFR 1926.62

1.4 DEFINITIONS

- A. Site Safety Official (SSO): The individual who is responsible to the Contractor and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements.
- B. SSO shall possess full and complete authority to order stoppage of any work which he deems unsafe.

1.5 SUBMITTALS

- A. Provide within seven (7) days after execution of the Agreement.
 - Site-specific HASP including the Emergency Response Plan to the Owner, Owner's Representative and Architect for review, including provisions for decontamination and a contingency plan for unforeseen emergencies. The review is only to determine if the HASP meets basic regulatory requirements and the minimum requirements of this Section. The review will not determine the adequacy of the HASP to address all potential hazards, as that remains the sole responsibility of the Contractor.

- 2. Current certification of employee's health and safety training and certification of employee's baseline medical exam status.
- 3. Certification of additional required health and safety training for Supervisors.
- 4. Qualifications and experience of the SSO for approval.
- B. Submit minutes of weekly safety meetings at periodic progress meetings.
- C. Refer to related submittal requirements in Section 02 82 00 Asbestos Abatement for project.

1.6 CONTRACTOR'S RESPONSIBILITIES

- A. Contractor is solely responsible for the health and safety of workers employed by the Contractor, any Subcontractor and anyone directly or indirectly employed by any of them.
- B. Develop and follow a site-specific Health & Safety Plan (HASP) in accordance with the requirements of paragraph 1.07.
- C. Provide a full-time SSO regardless of whether or not the Work is at a defined Uncontrolled Hazardous Waste Site.
- D. Pre-arrange emergency medical care services at a nearby hospital, including establishment of emergency routes of travel.
- E. Meetings:
 - Conduct daily job briefings with all site personnel to discuss relevant health and safety issues including but not limited to hazards, monitoring, procedures and controls. Document attendance and topics covered.
 - 2. At a minimum, conduct weekly safety meetings with all site personnel, documenting attendance and topics covered.
- F. Train all workers assigned to areas where contaminated media are likely to be encountered in accordance with 29 CFR 1910.120.
- G. Include those workers involved with the abatement of Asbestos containing materials in a medical surveillance program and respiratory protection program that meet the requirements of 29 CFR 1910.120 and 29 CFR 1910.134, respectively.
- H. In areas where contaminated media are likely to be encountered, monitor air quality in and around work area using appropriate air monitoring equipment/analysis, as indicated in Part 2. Record all readings and maintain record on site. Stop work and/or upgrade respiratory protection or personal protective equipment levels if action levels established in the HASP are exceeded. Ensure that degree and type of respiratory protection provided is consistent with the monitored concentrations and individual chemical parameters. Lawfully dispose of all contaminated clothing and equipment that cannot be decontaminated.

1.7 HEALTH & SAFETY PLAN (HASP) REQUIREMENTS

- A. The following items shall be addressed in the HASP:
 - 1. Safety and health hazard assessment
 - 2. Procedures for emergency medical treatment and first aid
 - 3. Map indicating route to hospital for emergency medical care
 - 4. Lead Exposure Control Plan (29 CFR 1926.62)
 - 5. Equipment decontamination procedures
 - 6. Air monitoring procedures and action levels

- 7. Personal protective equipment and decontamination
- 8. Physical hazard evaluation and abatement including:
 - a. Equipment operation
 - b. Confined space entry
 - c. Slips and falls
 - d. Building collapse
 - e. Falling debris
 - f. Encountering unmarked utilities
 - g. Cold and heat stress
 - h. Hot work (cutting and welding)
 - i. Excavation entry
- 9. Training requirements
- 10. Recordkeeping requirements
- 11. Emergency response plan that includes:
 - Names of three (3) emergency response contractors, experienced in the removal and disposal of oils and hazardous chemicals, that the contractor intends to use in the event of an emergency
 - b. Evacuation routes and procedures
 - c. Emergency alerting and response procedures

1.8 CONTINGENCY MEASURES & NOTIFICATIONS

- A. The potential for encountering hazardous buried objects or materials that could pose a threat to human health or the environment exists at the Project Site. In the event that potentially hazardous materials are encountered during the work under this contract, the responsibilities of the Contractor and the Owner's Representative are described herein.
- B. The procedures and protocols to be used by the SSO in defining materials that are potentially hazardous include screening with a photoionization detector, odor, visual appearance of a material, and obvious oil or chemical contaminated materials.
- C. Upon encountering suspected hazardous buried objects or materials as described above, cover the excavation immediately if no imminent danger, as defined by the SSO, is present. If there is an imminent danger, as defined by the SSO, evacuate the area immediately. The SSO shall then notify the Owner's Representative of the situation.
- D. Establish, properly barricade, and mark the area as an exclusion zone under the direction of the SSO. The SSO shall establish the exclusion zone boundaries based upon air quality monitoring using a photoionization detector and other equipment as appropriate. The exclusion zone shall be established at a minimum 50-foot radius around the location where the potentially hazardous material is encountered. Work within the exclusion zone shall be discontinued until the hazardous condition has been remediated and testing indicates that a hazard does not exist. Other activities of the site, outside the limits of the exclusion zone shall continue. Ambient air quality monitoring shall be performed by the SSO to demonstrate that ambient air quality in other portions of the site is not adversely impacted by the exclusion zone condition.
- E. Notify Owner's Representative regarding the presence of potentially hazardous materials. Owner's Representative may direct the Contractor to notify

- regulators and to obtain necessary regulatory approvals for remediation.
- F. Mobilize the appropriate equipment and personnel to sample and test the hazardous material within the exclusion zone to determine the remedial action required, subject to the Owner's Representative's direction. Contractor may be directed to remove and legally dispose of the material. Compensation for the removal and disposal of hazardous material will be as a Change in Work and Change in Contract Price in accordance with the Subcontract Agreement, if not covered under a specific bid item.

PART 2 - PRODUCTS

2.1 AIR MONITORING EQUIPMENT

- A. Provide and maintain portable photoionization detector or organic vapor analyzer capable of detecting organic vapors or total hydrocarbons. Equipment shall be sensitive to the 0.5 PPM level.
- B. Provide and maintain an oxygen analyzer to measure oxygen concentration in any trench or confined space prior to entry, as determined by the SSO.
- C. Provide and maintain an explosimeter whenever the potential for accumulation of explosive gases exists, as determined by the SSO.
- D. Provide and maintain air monitoring equipment as required for the collection/monitoring of airborne asbestos fibers. All air samples related to abatement work shall be analyzed by a laboratory accredited by the American Industrial Hygiene Association.
- E. All air monitoring equipment shall remain the property of the Contractor.

PART 3 - EXECUTION - NOT USED

End of Section

SECTION 014100 - PERMITS AND COMPLIANCE

1.1 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the General Conditions and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.

1.2 REQUIREMENTS INCLUDED

- A. Permits and Licenses
- B. Compliance
- C. Additional Compliance

1.3 PERMITS AND LICENSES

A. The Contractor shall obtain, maintain and pay for all permits and licenses necessary for the execution of the work and for the use of such work when completed.

1.4 COMPLIANCE

A. The Contractor shall give all notices, pay all fees and comply with all laws, rules and regulations applicable to the work.

1.5 ADDITIONAL COMPLIANCE

- A. The Contractor, Subcontractors, and the employees of the Contractor and Subcontractors, shall comply with all regulations governing conduct, access to the premises, operation of equipment and systems, and conduct while in or near the premises and shall perform the work in such a manner as not to unreasonably interrupt or interfere with the conduct of business of the Facility.
- B. Further, attention is directed to requirements of Section 011500.

End of Section

SECTION 014219 - REFERENCE STANDARDS

1.1 QUALITY ASSURANCE

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.
- C. Conflicting Requirements: Where compliance with two or more standards is specified, and the standards may establish different or conflicting requirements for minimum quantities or quality levels comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- 1.2 REFERENCE STANDARDS The abbreviations, which may be used in the construction specifications, refer to the organizations and specifications of the organizations listed below.

ASC Associated Air Balance Council AI Asphalt Institute AISC American Institute of Steel Construction ADC Air Diffusion Council ALSC American Lumber Standards Committee AMCA Air Movement and Control Association ARMA Asphalt Roofing Manufacturers Association ASC Adhesive and Sealant Council ASLA American Society of Landscape Architects ASHRAE American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. ASTM American Society for Testing and Materials International CLFMI Chain Link Fence Manufacturers Institute CRI Carpet and Rug Institute CS Commercial Standard of NBS FS Federal Specifications (General Services Administration), Specifications Unit (WFSIS) GANA Glass Association of North America GS Green Seal IEEE Institute of Electrical and Electronics Engineers IESNA Illuminating Engineering Society of North America IGMA Insulating Glass Manufacturers Alliance LSGA Laminators Safety Glass Association MFMA Maple Flooring Manufacturers Association NFPA National Fenestration Rating Council NHLA National Fenestration Rating Council NHLA National Paint and Coatings Association NPCA National Paint and Coatings Association	A A D.O.	
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CRI Carpet and Rug Institute CS Commercial Standard of NBS FS Federal Specifications (General Services Administration), Specifications Unit (WFSIS) GANA Glass Association of North America GS Green Seal IEEE Institute of Electrical and Electronics Engineers IESNA Illuminating Engineering Society of North America IGMA Insulating Glass Manufacturers Alliance LSGA Laminators Safety Glass Association MFMA Maple Flooring Manufacturers Association, Inc. AIMA North American Insulation Manufacturers Association NFPA National Fire Protection Association NFRC National Fenestration Rating Council NHLA National Hardwood Lumber Association NOFMA National Oak Flooring Manufacturers Association NPCA National Paint and Coatings Association NPCA National Particleboard Association	ASTM	American Society for Testing and Materials International
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NPCA National Paint and Coatings Association NPA National Particleboard Association	NOFMA	National Oak Flooring Manufacturers Association
NPA National Particleboard Association	NPCA	
NSF National Sanitation Foundation International	NPA	National Particleboard Association
	NSF	National Sanitation Foundation International

NTMA	The National Terrazzo and Mosaic Association
RFCI	Resilient Floor Covering Institute
SFPA	Southern Forest Products Association
SIGMA	Sealed Insulating Glass Manufacturers Association
SPC	Southern Pine Inspection Bureau (Grading Rules)
SSPC	Steel Structures Painting Council
WDMA	Window & Door Manufacturers Association
WMMP	Wood Moulding and Millwork Producers Association
WRI	Wire Reinforcement Institute, Inc.
WSFI	Wood and Synthetic Flooring Institute
WWPA	Woven Wire Products Association

B. Federal Agencies

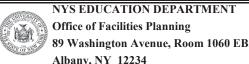
CE	Army Corps of Engineers)
CPC	Consumer Product Safety Commission
EPA	Environmental Protection Agency
DOE	Department of Energy
NIST	National Institute of Standards and Technology
OSHA	Occupational Safety & Health Administration

Further attention is directed to industry guide complied by Sweet's division of McGraw-Hill denoted as "PROJECT INFORMATION AND SERVICES" as well as in the web site www.4specs.com wherein a comprehensive list of international organizations representing building product manufacturers, associations, institutes, governmental agencies and testing bureaus is put forth.

- 1.3 APPLICABLE CODES: The following is a listing of applicable codes within the jurisdiction of the Work:
 - A. IBC: 2020 International Building Code
 - B. IFC: 2020 International Fire Code
 - C. IMC: 2020 International Mechanical Code
 - D. IPC: 2020 International Plumbing Code
 - E. IGC: 2020 International Fuel Gas Code
 - F. IEBC: 2020 International Existing Building Code
 - G. IECC: 2020 International Energy Conservation Code
 - H. MPS: 1998 Manual of Planning Standards
 - I. 115: 8 NYCRR 155 Regulations of the Commissioner of Education

End of Section

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Comments:

STATEMENT OF SPECIAL INSPECTIONS AND TESTS

89 Washington Avenue, Room 1060 EBA As required by the Building Code of NYS (2020 BCNYS) Albany, NY 12234 Note: The code listings below are not to be considered all inclusive. BCNYS § 1704.2.3 requires the NYS Licensed Design Professional (of record) to complete the Statement of Special Inspections and Tests. Completion of the Statement of Special Inspections & Tests, and; Submission to the Office of Facilities Planning with the Construction Permit Application is a condition for issuance of the Building Permit. School District Project Tiltle Orange Ulster BOCES Addition and Alterations at Axelrod Special Education Center Building Emaunel Axelrod Special Education Center SED Project # Project Address 44-90-00-00-0-009-036 103 Gibson Rd, Goshen, NY 10924 Engineer: MHE Engineering Exp. 02/28/2025 Date A/E Firm (or Dba): Phone 12/5/2023 MHE Engineering 111 Wheatfield Drive Suite 1 Milford, PA 18337 (570) 296-2765

INSPECTION AND TESTING Continuous & Periodic is as Defined by the BCNYS- CHAPTER 17 All reports to be submitted to the owners representative for use, approval and record.		CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	CHECK IF REQUIRED	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
A. Steel Construction Ch. 22							
1.	Material verification of high-strength bolts, nuts and washers.		X	AISC 360	1705.2 2204	✓	051200
2.	Inspection of high-strength bolting.	X	X	AISC 360 ACI 318	1705.2 2204.2	✓	051200
3.	Material verification of Structural Steel. Open Web Steel Joist and Girders. Basic protection of steel members, Seismic Resistance			AISC 360 ASTM A6, A514, A29 SJ100, 200 AICS 341	1705.2 2203, 2205 1705.2 2207		051200, 052100
4.	Spray Applied Fire Resistant Materials & Specialized Finishes			ASTM E605, E736	1705.14 1705.15		
5.	Cold Formed Steel Construction- load bearing. Seismic Resistance			AISI S100, S220, S240 ANSI/SDI -NC1.0, RD1.0, SDI-C, ASCE 7, 8 AISI S400	1704.2.5 2210 2211	✓ □	054000
6.	Material verification of weld filler materials.			AWS D1.1, D1.3	1705.2 2204.1	V	051200
7.	Inspection of welding:			ACI 318: 26.6.4	T 1705.3 2204	V	051200
	a. Structural steel	X	X	AWS D1.1, D1.3	1705.2	>	051200
	b. Reinforcing steel	X	X	AWS D1.1, D1.3	1705.3.1		
	c. Cold Formed Steel Deck			AISC S100, ASCE 7, 8	1705.2.2	V	053100
8.	Inspection of steel frame joint details.		X		1705.2		

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INSPECTION AND TESTING Continuous & Periodic is as Defined by the BCNYS- CHAPTER 17 All reports to be submitted to the owners representative for use, approval and record.		SOUTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	K I	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY	
B.								
1.	Inspection of reinforcing steel, including prestressing tendons, and verify placement.		X	Ch. 21, 22 ACI 318; Ch 20, 25.2, 25.3, 26.6.1, 26.6.3 AISC 360	T 1705.3 1901 1905	✓	032000	
2.	Inspection of reinforcing steel bar welding.			ACI 318, AWS D1.4	T 1705.3			
3.	Inspection of anchors to be installed in concrete prior to and during placement.	X		ACI 318: 17.8.2, 17.8.2.4	T 1705.3	V	033000	
4.	Verify use of required design mix.		X	ACI 318: Ch. 19, 26.4.3, 26.4.4	T 1705.3 1904 1908	V	033000	
5.	Sampling fresh concrete: slump, air content, temperature, strength test specimens.	X		ASTM C172, C31 ACI 318: 26.5, 26.9, 26.10, 26.11	T 1705.3 1901 1905 1908	V	033000	
6.	Inspection of placement for proper application techniques.	X		ACI 318: 26.5	T 1705.3	V	033000	
7.	Inspection for maintenance of specified curing temperature and techniques.		X	ACI 318: 26.5	T 1705.3 1908 1909	V	033000	
8.	Inspection of prestressed concrete.	X		ACI 318: 26.10	T 1705.3			
9.	Erection of precast concrete members.		X	ACI 318: 26.9	T 1705.3			
10.	Verification of in-situ concrete strength prior to stressing of tendons and prior to removal of shores and forms from beams and slabs.		X	ACI 318: 26.11.2	T 1705.3			
11	Inspection of formwork		X	ACI 318: 26.11.1.2 (b)	T 1705.3	V	031000	

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С.	Masonry Construction		ı		Ch. 21	1	1	
INSPECTION AND TESTING Continuous & Periodic is as Defined by the BCNYS- CHAPTER 17 All reports to be submitted to the owners representative for use, approval and record.		CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	K I	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY	
	L1 = Level 1 Inspection required for nonessential facilities. L2 = Level 2 Inspection required for essential facilities. * In general, schools are not considered essential facilities unless they are a designated emergency shelter.			ASTM E119 TMS 402, UL 263 403, 404, ASTM C1364 504, 602 ASTM C1670 ASTM A706 ASCE 7, 8	1705.4 2101 1604			
1.	Verify to ensure compliance: a. Proportions of site prepared mortar and grout.		X L1 & L2		1705.4 2103.2	7	042200	
	b. Placement of masonry units and construction of mortar joints.		X L1 & L2		1705.4 T 1705.3	V	042200	
	c. Location and placement of reinforcement, connectors, tendons, anchorages.		X L1 & L2		1705.45 2103.4 T 1705.3	V	042200	
	d. Prestressing technique.		X L1		1705.4			
	Grout space prior to grouting.	X L2			1705.4			
	e. Grade and size of prestressing tendons and anchorages.		X L1		1705.4			
	Placement of grout.	X L2			1705.4			
	f. Grout specs prior to grouting.	X L2			1705.4	V	042200	
2.	Inspection program shall verify:						042200	
	Size and location of structural elements.		X L1 & L2		1704.5 1705.4	✓	042200	
	b. Type, size, and location of anchors.	X L2	X L1		1705.4 T 1705.3	V	042200	
	 Specified size, grade, and type of reinforcement. 		X L1 & L2		1704.5	V	042200	
	d. Welding of reinforcing bars.	X L1 & L2			1704.5			
	e. Cold/hot weather protection of masonry construction.		X L1 & L2		1704.5, 2104.3, 2104.4	V	042200	
	f. Prestressing force measurement and application.	X L2	X L1		1704.5			
3.	Verification accessory placement prior to grouting:	X L2	X L1		1704.5, 2105.2.2, 2105.3	✓	042200	
4.	Grout placement.	X L1			1704.5	7	042200	
5.	Preparation of grout specimens, mortar specimens, and/or prisms.	X L1 & L2			1704.5, 2105.2.2, 2105.3	7	042200	
6.	Compliance with documents and submittals.		X L1 & L2		1704.5	✓	042200	

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INSPECTION AND TESTING Continuous & Periodic is as Defined by the BCNYS- CHAPTER 17 All reports to be submitted to the owners representative for use, approval and record.		CONTINUOUS	PERIODIC	REFERENCE STANDARD	BCNYS REFERENCE	ECK I	IDENTIFY SPEC SECTION AND PROVIDE CLARIFYING NOTES IF NECESSARY
D.	Wood Construction		-	•	Ch. 23		
1.	Fabrication process of prefabricated Wood Structural Elements and assemblies.		X	Ch. 16 AWC, APA, CPA, DOC PS1, PS2	1704.6, 1705.5 2302, 2303 2304		
2.	High-load diaphrams Seismic Resistance		X		1704, 1705, 1704.6 2304, 2305 2306, 2307, 2308		
E.	Soils			•	Ch. 18		
1.	Geotechnical Investigations, Excavations, Grading, Fill Damp-proofing/ Water-Proofing		X	ASTM, NYS DOT OSHA Appendix J- BCNYS	1704, 1706 1803, 1804, 1805	~	0312334, Geotechnical Report Available
2.	Flood & Stormwater Hazards [per BCNYS 106]		Х	Local Highway Authority Flood Plain Admin. Appendix G- BCNYS	1703 1610, 1611, 1612 1805.1.2.1		
F.	Specialized Foundations- Piers, Piles				Ch. 16		
1.	Deep Foundation Elements: Driven Piles Cast in Place Helical Piles		X		T 1705.7 T 1705.8 1705.7 1705.8 1705.9		
G.	Exterior Wall Coverings				Ch. 14		
1.	Exterior Insulation and Finish Systems (EIFS) MCM, HPL, Other Combustible Materials		X	ASTM E2568, E2273, E2570 E2393, E84 Ch. 16 NFPA 268, 275, 285, 286	1405, 1406, 1407, 1408 1704.2, 1705.12.5 1705.16		
Н.	Misc.						
1.	Access Floors and Storage Racks Other Architectural, MEP Components Seismic Resitance		X		1705.12		
2.	In-Situ Testing		X		1604.6, 1708		
3.	Pre-Construction Load Testing		X		1604.7, 1709		
4.	Fire Resistant Penitrations & Joints Fire Stops Testing for Smoke Control		X	Ch. 7 ASTM E119 UL 263	1705.17 1705.18		
5.	Pre-Submission: Inventory of all Fire-Resistant-Rated Construction- Level 2 Alterations and greater [per BCNYS 106]	X		verification required EBCNYS Ch. 3 C. of E. 155 Regulations.	FCNYS 701.6 BCNYS 703.7 19CRR-NY XXXII		
	Pre-Submission: Hazardous Material Survey Water Quality Survey	X X		verification required ACM Letter- Certificate C. of E. 155 Regulations.	US-EPA NYS-DOH		
7.	Other:						

SECTION 014330 - MOCKUPS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 SUMMARY

- A. General: Provide and coordinate mock-up assemblies at Project site for Architect's review and acceptance, in accordance with requirements of the Contract Documents. Refer to individual Specification Sections for mock-up requirements. Generally, without limitation, mock-ups on site include the following:
 - Mock-ups of individual pieces of the work, as specified within individual Specification Section.
 - 2. Field Mock-Up of exterior wall components (Free-Standing). Refer to the Drawings for extent of mock-up.
- B. It shall be the responsibility of the Contractor to coordinate the work of the related Specification Sections so that each mock-up meets the specified requirements.
- C. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Individual Specification Sections for Submittal Samples.

1.3 DEFINITIONS

- A. Freestanding Mock-Ups: Full-size, physical assemblies that are constructed on-site in a protected location.
 - 1. Freestanding mock-ups are not part of the final construction. Freestanding mock-ups will be used to verify selections made under sample submittals, to demonstrate aesthetic effects, qualities of materials and execution, and to review construction, coordination, testing, and operation.
 - 2. Approved freestanding mock-ups establish the standard by which the Work will be iudged.
 - 3. Approved freestanding mock-ups remain on site during the balance of construction and are demolished and removed from site at completion of the Work they represent.
- B. In-Place Mock-Ups: Full-size, physical assemblies that are constructed in-place and remain part of final construction.
 - 1. In-place mock-ups will be used to verify selections made under sample submittals, to demonstrate aesthetic effects, qualities of materials and execution, and to review construction, coordination, testing, or operation.
 - 2. Approved in-place mock-ups establish the standard by which the Work will be judged.
 - 3. Approved mock-ups remain part of the completed Work.

1.4 SUBMITTALS

- A. Schedule: Construction Manager shall submit a schedule of mock-up construction, including dates for mock-up review by the Architect.
 - 1. Mock-up schedule shall be reviewed at each progress meeting, revised and resubmitted as required.
 - 2. Schedule shall allow sufficient time for mock-ups which are not accepted to be reconstructed and reviewed until accepted by the Architect.
- B. Shop Drawings of Mock-Ups: Provide large scale shop drawings for fabrication, installation and erection of all parts of each mock-up. Provide plans, elevations, and details of anchorage, connections and accessory items.
- C. Photographs of Mock-Ups: Submit photographs of mock-ups after completion of installation and acceptance of each mock-up.
- D. Submittal Samples: Refer to individual Specification Sections for submittal requirements of mock-up components and coordinate accordingly.

1.5 QUALITY ASSURANCE

A. Design Modifications: Make design modifications to work only as required to meet performance requirements and to coordinate the work. Indicate proposed design modifications on shop drawings. Maintain original design concept without altering profiles and alignments indicated.

PART 2 - PRODUCTS

2.1 MATERIALS AND PRODUCTS

A. Provide materials, components, and products for mock-ups as specified in individual Specification Sections.

PART 3 - EXECUTION

3.1 GENERAL

A. Refer to PART 3, EXECUTION portions of the various Specification Sections for specific requirements regarding condition of surfaces, erection, and erection tolerances.

3.2 FIELD MOCK-UP OF EXTERIOR WALL

- A. Provide a field mock-up of the exterior wall at location and in configuration indicated on Drawings. The exterior wall mock-up shall include the veneer systems and backup, one window and all related flashings and sealants, etc. Obtain Architect's acceptance of visual qualities prior to commencing work that individual mock-up is intended to represent. Protect and maintain approved mock-ups throughout the work of the Contract. Locate mock-ups at the Project site as directed by the Architect.
 - 1. Refer to Drawings for extent of the field mock-up.
 - 2. Provide modifications to mock-up as required until Architect's approval has been received.

3.3 FIELD MOCK-UP OF INTERIOR CONSTRUCTION

- A. Provide a field mock-up of the interior construction items at locations and in configuration indicated on Drawings or as otherwise directed. Obtain Architect's acceptance of visual qualities prior to commencing work that individual mock-up is intended to represent. Protect and maintain approved mock-ups throughout the work of the Contract. Locate mock-ups at the Project site as directed by Architect.
 - 1. Refer to Drawings for extent of the field mock-up.
 - 2. Provide modifications to mock-up as required until Architect's approval has been received.
- B. Interior Construction Mock-ups: Provide mock-ups of various interior construction as indicated or as specified in the applicable Specification Sections, as directed by the Architect.

3.4 INDIVIDUAL MOCK-UPS

- A. Provide individual mock-ups of types and sizes required by individual Specification Sections to evaluate and set the standard of quality for that work. Obtain Architect's acceptance of visual qualities prior to commencing work that individual mock-up is intended to represent. Protect and maintain approved mock-ups throughout the work of the Contract. Locate mock-ups at the Project site as directed by the Architect.
 - 1. Provide as many mock-ups as required until Architect's approval has been received.
 - 2. When indicated in individual Specification Sections, approved mock-ups may be incorporated into the finish work.

3.5 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as non-visible as possible.
- B. Protect construction exposed by or for quality-control service activities.

3.6 REMOVAL AND DISPOSAL

A. Demolish and remove mock-ups from site at the completion of the Project. Legally dispose of demolished mock-up materials. Comply with requirements of Section 017400 – CONSTRUCTION WASTE MANAGEMENT.

END OF SECTION

SECTION 015000 - TEMPORARY FACILITIES & CONTROLS

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.
 - 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 sheds.
 - 2. Architects/Engineers field office.
 - 3. Temporary roads and paving.
 - 4. Dewatering facilities and drains.
 - 5. Temporary enclosures.
 - 6. Hoists and temporary elevator use.
 - 7. Temporary project identification signs and bulletin boards.
 - 8. Waste disposal services.
 - 9. Rodent and pest control.
 - 10. 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.
 - Pest control.
 - 6. Security enclosure and lockup.
 - 7. Temporary enclosures.
 - 8. Temporary partitions.

1.2 DIVISION OF RESPONSIBILITIES

A. General: Each Prime Contractor is specifically assigned certain responsibilities for temporary services and facilities to be used by other Prime Contractors, and other nonprime contractors and separate entities at the site, Owner's workforces, Construction Manager, Architect, testing agencies, personnel of governing authorities, and personnel authorized to be at project site during contract time. The General Construction Work Contractor 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 Contract Documents.

1.3 USE CHARGES

- A. General: 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.
- B. Water Service: Use water from the Owner's existing water system without metering and without payment of use charges if available. If not, available contractor needing water must supply water required for the performance of their work.
- C. Electric Power Service: Temporary electric power including set-up, maintenance and potential use charges is the responsibility of the Electrical Work Contractor.
 - 1. Use of electric power from the Owner's permanent power system (when operational) will be granted to all Prime Contractors without payment of use charges.
 - 2. Electrical Work Contractor is to supply power to all job trailers including the Construction Manager's job trailer as directed.
 - 3. Subpanels and sub-feeds for the Hazardous Material Contractor support/scope shall be supplied by the Hazardous Material Contractor. This is required of the Hazardous Material Contractor due to the nature and location of the work. Once the Hazardous Material Contractor has completed their scope the building is then accessible by other Primes. Following this schedule, all additional subpanels and subfeeds to ancillary panels will be provided by and connected to permanent panels by Electrical Contractor. Both Primes shall follow all OSHA and NFPA requirements for temporary connections. All panel penetrations shall be patched per approved NFPA regulations.

1.4 SUBMITTALS

- A. Temporary Utilities: The 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. Temporary Signage: Provide shop drawings, indicating the size and layout of the signs, color choices for Owner selection and installation details. Temporary site signage is by the General Contractor (interior and exterior) if included within the bidding documents, otherwise shall be the responsibility of the General Contractor.

1.5 QUALITY ASSURANCE

- A. Regulations: The Prime 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 Prime 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."
 - 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.
 - 2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

- A. Temporary Utilities: The Prime Contractor shall prepare a schedule indicating dates for implementation and termination of each temporary utility for which the Contractor is responsible. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.
 - Temporary Use of Permanent Facilities: The Installer of each permanent service shall assume responsibility for its operation, maintenance, and protection during use as a construction facility prior to the Owner's acceptance, regardless of previously assigned responsibilities.
- B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: The Prime Contractor shall provide new materials. If acceptable to the Architect, 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 temporary offices, shops, and sheds within the construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding.
 - 2. For signs and directory boards, provide exterior-type, Grade B-B high-density concrete form overlay plywood of sizes and thicknesses indicated.
 - 3. For fences and vision barriers, provide minimum 3/8-inch-thick exterior plywood.
 - 4. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8-inch-thick exterior plywood.
- C. Pavement: Comply with Division 2 Pavement Sections
- D. Insulation: Unfaced mineral-fiber blanket manufactured from glass, slag wool, or rock wool; with maximum flame spread and smoke developed indices of 25 and 50, respectively.
- E. Gypsum Wallboard: Provide gypsum wallboard on interior walls of temporary offices.

- F. 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.
- G. Paint: Comply with requirements of Division 9 Section "Painting."
 - 1. For job-built temporary offices, shops, sheds, fences, and other exposed lumber and plywood, provide exterior-grade acrylic-latex emulsion over exterior primer.
 - 2. For sign panels and applied graphics, provide exterior-grade alkyd gloss enamel over exterior primer.
 - 3. For interior walls of temporary offices, provide 2 coats of interior latex-flat wall paint.
- H. 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.
- I. Water: Provide potable water approved by local health authorities.
- J. Open-Mesh Fencing: Provide 0.12-inch- thick, galvanized 2-inch chainlink fabric fencing 8 feet high with galvanized barbed-wire top strand and galvanized steel pipe posts, 1-1/2 inches I.D. for line posts and 2-1/2 inches I.D. for corner posts.
- 2.2 EQUIPMENT (Each Prime Contractor)
- A. General: Prime Contractor shall provide new equipment. If acceptable to the Architect, 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 LED or 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 Units: Provide temporary heating units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.
- G. Temporary 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.
- H. Temporary Toilet Units: 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.

- I. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.
 - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 TEMPORARY UTILITY INSTALLATION

- A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.
 - 1. Arrange with the company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services.
 - 2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
 - Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.
- B. Water Service: Plumbing Contractors shall provide and maintain temporary water service and distribution for the scope of work. Piping of sizes and pressures adequate for construction and hose bibs on site to provide service to all areas of construction activities as directed by the Architect, as required throughout the construction period.
 - 1. Water service shall be potable and modified as required or as directed by the Architect, as Work progressed.
 - a. Sterilization: Sterilize temporary water piping prior to use.
 - Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel who handle materials that require wash up. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.
 - 3. Drinking Water Facilities: All Prime Contractors to provide bottled water to their own employees/subcontractors.
 - a. The Prime Contractors shall provide containerized, tap-dispenser, bottled-water drinking-water units, including paper cup supply.
 - 4. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel where applicable by OSHA.
 - 5. Users shall provide their own hoses to points of need but shall practice prudent conservation.
- C. Temporary Electric Power Service: The Electrical Work Contractor shall provide and maintain temporary electric service consisting of main power hook-up and panel board and temporary lighting for site and existing building. Temporary service shall be maintained during all hours in case of emergency after hour response and shall comply with all codes and regulations. System shall be modified as required or as directed by the Architect/Construction Manager as work progresses. Each Prime Contractor shall provide power distribution for its own use from EC's panel.
 - Electrical service:

- Obtain temporary service from existing building service or local power pole. If practical, power to each location shall be tapped at transformer vault or main distribution panel, ahead of main breakers to minimize demand on service equipment from operations. Over-current protection shall be installed as required.
- 2. Provide disconnect at connection to service.
- 3. Provide service conductors and equipment.
- 4. Minimum power characteristics: 240/120 volt, single phase.
- 5. Provide distribution equipment, feeders, and branch circuit panelboards to serve:
 - a. Temporary lighting.
 - b. Temporary convenience receptacles. (4 gang outlet boxes to allow for 50' extension cord; enough to accommodate requirements of the entire building)
 - c. To accommodate construction operations requiring power, use of power tools, electric heating and start up testing of permanent electric powered equipment prior to its permanent connection to electrical system.
- 6. Each Contractor shall provide his own extension lines, and other special equipment; welding equipment shall run from generator trucks.
- 7. The Electrical Work Contract shall be responsible for initial connections and final demolition of all temporary fixtures and wiring at direction of the Architect/Construction Manager.
- 8. The Electrical Work Contract Contractor shall maintain OSHA standards for power and foot candle levels in all areas while workers occupy the space. The temporary lighting shall be energized daily from 6:30 A.M. to 9:00 P.M. as a minimum duration until permanent fixtures are installed. This shall be adjusted pending off shift work or at direction of the Architect/Construction Manager.
- Not unlike other equipment in this contract, upon installation, the temporary electric system becomes the property of the Owner and shall not be controlled by any one contractor.
- 10. Temporary Site Lighting: Electrical Work Contract to maintain existing interior and exterior Lighting to adequately light the entrances and exits of project site. Temporary lighting shall be controlled by time clocks and lighting contactors; settings to be coordinated by the Architect/Construction Manager.
- 11. Each Prime Contractor will be responsible for coordinating hookup of their own project trailers to temporary electric pedestal. If abused, power from temporary service will be disconnected. The Electric Contractor shall erect poles safely sufficient for site power and telephone service. All installations shall conform to strictest standards. The Electric Contractor shall disconnect all items upon project completion.
- 12. Hazardous Material Contractor shall provide and install temporary power to Hazardous Material Contractor's equipment as required up to the Hazardous Material Contractor provided sub/supply panel.
- 13. Hazardous Material Contractor shall provide and install temporary lighting within the work area, and remove such lighting once complete with their scope of work.
- D. Temporary Telephones: Each Prime Contractor shall provide temporary telephone service throughout the construction period for all personnel engaged in construction activities.
 - 1. Contractors are required to lease or purchase a cellular telephone to be used by their site superintendents for communication with the other primes and the Architect
 - 2. Provide telephone lines for the following:

- a. Provide a dedicated telephone line for a fax machine in each prime contractor's field office.
- b. At each telephone, post a list of important telephone numbers.
- E. Sanitary Facilities: The General Work Contractor shall provide temporary portable chemical toilet facilities for all construction personnel. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
 - 1. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used material.
 - 2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.
 - a. Provide separate facilities for male and female personnel.
- F. The General Work Contractor Temporary Construction:
 - 1. Temporary bridging, decks, hoists, lifts, scaffolding, and cranes shall be the responsibility of Contractor requiring same.
 - 2. Provide temporary partitions to separate construction area from adjacent occupied areas. Construct partitions with non-combustible materials or fire-retardant plywood and seal seams and gaps to control transmission of dust to occupied areas. After completion of work, remove partitions and restore surfaces damaged by temporary provisions. This work is the responsibility of the General Work Contractor where applicable. Install temporary walls, zip walls, partition walls to separate Construction activities as directed from the Construction Manager
 - Temporary entrances and exits to the building shall be furnished, installed and maintained under the General Work Contractor as directed by the Architect/Construction Manager. Exits shall be maintained for exiting in emergency conditions until permanent structures are in place.
 - 4. Temporary entrances and exits to the site shall be furnished, installed and maintained under the General Contractor as directed by the Construction Manager. Barrels, cones and other visual devices shall be used at all elevation changes subject to vehicle traffic. Fences, snow fences and NOT caution tape will be used to separate public from equipment, elevation hazards

G. Daily cleanup

- Dumpsters are to be provided by The General Work Contractor for the duration of the project, post Hazardous Material Contractor completion. Dumpsters will be inspected to ensure they are not misused and removed and hauled to a recycling center off site for processing. THE OWNER NOR THE ARCHITECT/CONSTRUCTION MANAGER will not be responsible for the removal of any hazardous materials, this will be the responsibility of the Hazardous Material Contractor performing this scope.
- The maintenance of a clean work site shall be the responsibility of each Contractor.
- 3. Each Contractor shall remove their own debris daily from work area to waste disposal containers (dumpsters), time lapse is not acceptable.
- 4. Each and every Contractor working on site shall submit manpower on Friday at 8 A.M. to work as a team to remove debris to dumpsters until complete. At discretion of Architect/Construction Manager, a Contractor not complying may be back-charged for work performed by others. The responsibility of broom cleaning and debris disposal remains with each trade for their work and shall include use of sweeping compound.

- Final cleaning shall be the responsibility of each Prime Contractor for his/her own work.
- 6. The General Contractor shall handle all construction site snow removal as needed for work area safety or as directed by the Construction Manager.
- Protection of Work: Each Prime Contractor is reminded to temporarily protect work in place until accepted by the Owner per Article 10 of the General Conditions of the Contract.
- 8. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 3 days during normal weather or 1 day when the temperature is expected to rise above 80°F (27°C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containing properly. Dispose of material lawfully. First aid requirements are the responsibility of each Contractor. Retain paragraph above where potable water is accessible from permanent or temporary lines. Where potable water is not available, retain paragraph below.

3.2 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. The 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.
- C. The Prime Contractor will be responsible for hookup of their own project trailers. Use of energy, including heat (shall be set back at night) if practical from electric service will be available. If abused, power from temporary service will be disconnected. All installations shall conform to strictest standards. The Electrical Contractor shall be responsible for hooking up Construction Managers Trailers. Coordinate this installation and assume trailer to remain for a multiple phase/year construction project.

3.3 SUPPORT FACILITIES INSTALLATION

- A. Each Prime Contractor is to have a field office. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access as directed by the Architect /Construction Manager.
 - 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.
- B. Provide incombustible construction for offices, shops, and sheds located within the construction area or within 30 feet of building lines. Comply with requirements of NFPA 241.
- C. Field Offices: Each Prime Contractor shall provide an insulated, weathertight temporary office of sufficient size to accommodate required office personnel at the Project Site. Keep the office clean and orderly for use for small meetings. Furnish and equip offices as follows:
 - 1. Furniture: Furnish with a desk and chairs, a 2-drawer file cabinet, plan table, plan rack, and a bookcase.

- 2. Equip with a water cooler and private toilet complete with water closet, lavatory, and medicine cabinet unit with a mirror.
- D. Storage and Fabrication Sheds: Install storage and fabrication sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on-site.
- E. Temporary Parking/Staging and Access Roads
 - 1. Temporary roads are installed and/or maintained by the General Work Contractor where designated on-site logistics plans. Contractors will be permitted to utilize existing roads, as designated (as segregated by the Owner if required).
 - 2. Road Cleaning: Maintain roads and walkways in an acceptably clean condition. This includes the removal of debris daily, if required, and/or a minimum of once a week due to all project traffic. Road cleaning equipment to be wet/vacuum type. The General Work Contractor will clean the roads affected by all contract work and wet as necessary for dust mitigation/control. The General Work Contractor will maintain roads until project completion.
 - 3. Snow and ice removal: General Work Contractor shall maintain access for all suitable parking areas, driving areas, work scope areas. Other primes shall provide the General Work Contractor support as required to relocate tools, supplies, and equipment for the removal of snow by the General Work Contractor. As directed by the Architect/Construction Manager, snow shall be transported off site, as required to maintain a safe and productive work area.
 - 4. Contractor Parking/ Staging Area: General Work Contractor shall maintain access for suitable parking areas as indicated on Logistics plans. Re-grade, re-seed and restore any areas disturbed by parking/ staging.
 - a. Parking Areas: Includes contractors' employees and construction vehicle parking. Minimum of 6" reference Item. #304.3 course.
 - Access Roads: Includes access roads for delivery through staging area to building work areas, and to equipment and storage areas and sheds. Minimum of 9" reference Item. #304.3 course.
 - 5. Temporary parking by construction personnel shall be allowed only in areas so designated.
 - Traffic Regulations:
 - a. Utilize only entrances/temporary roads as designated
 - b. Construction parking will not be allowed adjacent to residential buildings, additions or monuments.
 - 7. Traffic Controls: The General Work Contractor provide temporary traffic controls at junction of temporary roads with public roads. Include warning signs for public traffic and "STOP" signs for entrance onto public roads. Comply with requirements of authorities having jurisdiction. A site traffic plan and protection plan will be submitted and approved to the Construction Manager prior to the start of construction. Plans shall include but not limited to vehicle division and protection, pedestrian division and protection, weekend plans, inclement weather plan, signage.
 - 8. General Construction Contract shall provide temporary enclosure of the building's roof windows and doors prior to "Permanent Enclosure".
 - 9. Temporary heat, ventilation, humidity control, and enclosure of the building prior to "Permanent Enclosure" where these facilities are necessary for its construction activity but have not yet been completed by the General Work Contractor.

- 10. Temporary ventilation to control temperature and humidity is required by the General Work Contractor, coordinate with the responsible Prime for installing the specified finish and equipment as these finishes may be damaged be excessive humidity or promote the growth of mold. The permanent HVAC system shall not be relied upon to provide the necessary ventilation or conditioning of the humidity in the building. Each Contractor is required to ensure/protect their work in place and provide the necessary ventilation and or humidity control.
- F. De-watering Facilities and Drains (General Work Contractor):
 - For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Sections, comply with dewatering requirements of applicable Division 2 Sections. Where feasible, use the same facilities. Maintain the site, excavations, and construction free of water.
 - 2. For temporary drainage and de-watering facilities and operations directly associated with the building and other construction activities, comply with Division 2; General Work Contractor is directly responsible for de-watering of all excavations and general site as required.
- G. Temporary Enclosures: The General Construction Work contractor shall provide temporary enclosure for protection of construction in progress and completed, from exposure, foul weather, other construction operations, and similar activities as follows unless otherwise noted:
 - 1. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 sq. ft. (2.3 sq. m) or less with plywood of similar materials.
 - Close openings through floor decks and horizontal surfaces with load-bearing, wood-framed construction.
 - Where temporary wood or plywood enclosure exceeds 100 sq. ft. (9.2 sq. m) in area, use UL-labeled, fire-retardant treated material for framing and main sheathing.
 - 4. Generally, temporary closures for specific openings for a Prime Contractor to perform their work openings are the responsibility of Contractor creating the opening and shall be installed to protect building from exterior elements. Hazardous Material Contractor shall seal windows and other openings as they are exposed. Material used shall withstand the elements to protect the building until such time when a more permanent weather tight enclosure can be installed. No damage to existing finishes/surfaces is allowed on the exterior of the building. The Hazardous Material Contractor shall be responsible for these openings until the General Contractor assumes the building. The General Contractor shall modify the openings to install zip wall sheathing within these areas to ensure a weather tight enclosure until the new work is installed. This opening shall be insulated, as needed/directed by the Construction Manager until the permanent work is installed.
 - 5. Hazardous Material Contractor shall be responsible for a temporary roof. This shall include material, proper drainage, overlapping building facias and coping to ensure no leaks within the building. The Hazardous Material Contractor shall be responsible for the temporary roof until the General Contractor assumes the building, at which time the General Contractor shall maintain the roof during the new roof installation.

- 6. Temporary partitions shall be installed at all openings where additions connect to existing buildings, and where required to protect areas, spaces, property, personnel, students, and faculty; to separate and control dust, debris, noise, access, sight, fire areas, safety and security and to separate phased construction areas per the phasing plan. Temporary partitions shall be installed and maintained. Construction material and methods to suit need as determined by Architect/Construction Manager.
- 7. Temporary Lifts and Hoists: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- H. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors as follows (per site): The General Construction Work Contractor shall furnish and install construction signage as required:
 - a. Engage an experienced sign painter to apply graphics. Comply with details indicated.
 - For construction traffic control/flow at entrances/exits, as designated by the Owner (3 required)
 - c. To direct visitors (2 required)
 - d. For construction parking (2 required)
 - e. To direct deliveries (2 required)
 - f. For warning signs as required
 - g. Per OSHA standards as necessary
 - h. For trailer identification
 - i. Temporary exit signs
- I. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containing properly. Dispose of material lawfully.
- 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION
- A. Operations of the Contractor may not block, hinder, impede, or otherwise inhibit the safe and expeditious exiting of the building's occupants during an emergency.
- B. The General Work Contractor will maintain site access for emergency personnel. In the event of an emergency, (designated by the sounding of the fire alarm system) all construction activities must immediately cease. Contractor's work force will evacuate themselves from work areas and remain outside of work areas until the "all clear" is given. No work operations will be tolerated during the evacuation of the building or during an emergency.
- C. 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.

- D. Temporary Fire Protection: General Work Contractor shall provide, 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 fireprotection 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.
 - Permanent Fire Protection: At the earliest feasible date in each area of the Project, complete installation of the permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

E. Fall Protection:

- 1. The General Construction Work Contractor shall provide temporary cable/railing top & mid railings per OSHA regulations around floor openings. Most of the exterior can be done by running cables from column to column, but some areas may require you to install posts as well. Include toe boards around perimeter and openings where required. The Prime Contractor must provide his own means for providing OSHA approved fall protection for his work persons. Temporary railings removed by a Prime Contractor for some reason other than constructing the permanent wall, must be immediately replaced by that Prime Contractor.
- 2. The General Construction Work Contractor shall rope off all roof openings in an OSHA approved manner. Include fluorescent ribbons or flags to accent the ropes
- F. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.
- G. Enclosure Fence: The General Work Contractor shall, before, excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering the site, except by the entrance gates.
 - 1. Provide open-mesh, 8-foot high chainlink fencing with posts at 8-feet on center, set in a compacted mixture of gravel and earth. Snow fence shall not be used to protect pedestrians from the work space
 - 2. Provide min. 3 double swing access gates and man gates. Each gate is to have a chain and padlock.
 - a. Provide (2) keys for each lock to the Architect/Construction Manager.
 - Remove fence upon completion of all exterior activities or sooner if directed by Architect.
- H. Security Enclosure and Lockup: The General Work Contractor shall install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.

- Storage: Where materials and equipment must 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
- I. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. 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.
- 3.5 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.
 - 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. Termination and Removal: Unless the Architect/Construction Manager requests that it be maintained longer, 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.
 - Materials and facilities that constitute temporary facilities are the property of each prime contractor. The Owner reserves the right to take possession of project identification signs.
 - 2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at the temporary entrances, as required by the governing authority.
 - 3. At Substantial Completion, clean and renovate permanent facilities 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 015000

015500 - MAINTENANCE AND PROTECTION OF TRAFFIC (NY)

PART 1 – GENERAL

1.1 WORK INCLUDED:

- A. Maintain traffic and protect the public from damage to person and property within limits of and for duration of the Contract.
- B. Provide all such signs, flag-persons, delineation and/or other methods as necessary so that a person who has no knowledge of conditions can safely and with a minimum of discomfort and inconvenience, ride, drive or walk over all or any portion of the street under construction where traffic is to be maintained.
- C. Maintain a reasonably smooth traveled way, acceptable to the Engineer, for movement of traffic.
- D. Maintain, at all times, access to all properties for emergency vehicles and services.
- E. Control dust and keep the traveled way free from materials spilled from hauling equipment. This shall also apply to dust control and spilled material resulting from the Contractor's operations in areas outside the contract limits.
- F. Insure conformance with this Section for all work performed by this Contractor and/or any Subcontractor thereof.

1.2 EXISTING CONDITIONS:

- A. It shall be the Contractor's responsibility to investigate all site conditions that may affect his work.
- B. It shall be the Contractor's responsibility to notify all appropriate jurisdictions, make any and all applications and comply with all requirements involved with the Maintenance and Protection of Traffic in compliance with all State and/or Local codes or requirements.

1.3 NECESSITY AND IMPORTANCE:

- A. The Contractor is placed on notice that Maintenance and Protection of Traffic over any street, road, highway or accessway during construction is to be considered as important and necessary an item of work as is the actual construction itself. The Contractor shall at all times conduct his operation in a manner to insure the safety of not only the public and motorists, but also pedestrians and his own employees.
- B. The Contractor shall protect the user from damage to person and property by reason of any construction operation (for example excavation, paving, tree work, demolition, etc.) by such protective screens, devices, signs, or methods.

1.4 REFERENCES:

A. All layouts, devices, signs, methods and procedures for all work under this Section shall comply with the requirements referenced in the National Manual on Uniform Traffic Control (MUTCD) and the New York State Supplement to the National MUTCD, years of latest revision.

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PART 2 - MATERIALS

2.1 SIGNS:

- A. All temporary signs, delineators, barricades, warnings, lights and other warning and guiding devices shall comply with the requirements of the National MUTCD and the New York State Supplement to the National MUTCD, except as otherwise specified, and shall remain the property of the Contractor.
- B. All temporary signs, delineators and other warning and guiding devices shall conform to the requirements of the Agency having jurisdiction on the roadway(s) wherein the contract work is being performed.

PART 3 - CONSTRUCTION DETAILS

3.1 GENERAL:

- A. Contractor shall generally provide a travel way suitable for one or more lanes of traffic. The way of travel shall be kept well drained and reasonably smooth and hard at all times and free of the potholes, bumps, irregularities and depressions that hold or retain water. The Contractor shall conduct his operations to insure a minimum of delay to the traffic. Stopping traffic for more than approximately five (5) minutes is considered unsatisfactory. Necessary equipment and personnel to attain and maintain a satisfactory riding surface shall be available and used as needed at all times, both when the work is under way and when the work is temporarily suspended for any period of time. Special attention shall be given to maintenance of a satisfactory way of travel over weekends, holidays and during the winter season, if applicable.
- B. Contractor shall keep the travel way free of foreign objects such as rocks, timber and other items that may fall from the transporting vehicles. Spillage of material carried by or dropped from the undercarriage of any carrying vehicle resulting from the Contractor's hauling operations along or across any public traveled way shall be removed immediately and such travel way, both within and outside of the contract limits shall be kept free of such spillage by the Contractor. The Contractor shall also provide a sufficient number of competent flag-persons in areas where traffic is congested, particularly where construction equipment is operating.
- C. Contractor shall maintain all elements of the street beginning on the date of execution of the contract and ending on the date the contract is accepted by the Owner. He shall provide an adequate travel way as specified. He shall devote particular attention to all the drainage facilities, keeping them fully operative at all times. Contractor will be required to plow snow or control ice on the travel way.
- D. He shall be responsible for the moving of any plowed snow that may be necessary to adequately maintain any element of the street, and he will be responsible for the moving of any plowed snow from in front of driveways or entrances. Any damage to any portion of the work occasioned by lack of adequate maintenance shall be repaired by the Contractor at his own expense.

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- E. Contractor shall provide and maintain at all times a safe and adequate ingress and egress to and from intersecting streets, homes, businesses and commercial establishments at existing or at new access points.
- F. Contractor shall furnish and erect reflectorized signs for the information of the motorist and to adequately and legally post the street under construction as to its status in compliance with the National MUTCD and the New York State Supplement to the National MUTCD.
- G. All signs shall be kept clean, mounted at the approved height and placed so as to be effective both day and night. Signs, warnings, delineators and barricades shall be used to adequately inform the motorist of any unusual or unsafe conditions and to safely and clearly guide him through the contract area. Such signs, warnings, or devices shall be placed so as to give timely warning and permit the motorist to take the necessary action to traverse the area safely.
- H. Shall maintain free access to every utility manhole and/ or box, fire hydrant or alarm box, valve box, valve chamber, etc.
- I. Dusty conditions resulting from the Contractor's operation, in the opinion of the Engineer, Owner or Agency responsible for the roadway, shall be corrected with application of water and broomed. Water used as a dust palliative shall be distributed uniformly over a minimum width of eight feet by the use of suitable spray heads or spray bars. The brooms shall be of sufficient force to effectively remove any foreign material on the wetted surface, without spraying or splashing the material onto adjacent structures, automobiles, buildings, pedestrians, etc. The Contractor may not use public or private water systems for these purposes without permission and/or payment to the system owner.

3.2 MAINTENANCE:

- A. Contractor is to maintain existing traffic control devices such as signs, etc.
- B. If temporary removal during construction is necessary, temporary signs should be installed to maintain traffic control in a likemanner.
- C. Traffic control devices shall be replaced, if damaged during the construction operations; removal, storage or replacement of the item shall be by the Contractor at his own expense.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT:

A. Unless otherwise specified in the Proposal or on the Plans, the Contractor shall, under this item, be responsible for the maintenance within the limits of the Contract of the entire pavement, drainage facilities and other street elements both old and new beginning on the date the Contract is executed and ending on the date the Contract is officially finally accepted.

4.2 FAILURE TO COMPLY:

A. In the event that, in the judgement of the Owner and/or Engineer, traffic is not adequately maintained on any part of the contract, on any day, no payment for

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maintenance and protection of traffic will be made for that day. The amount of such daily non-payment will be determined by dividing the lump sum amount bid for this item by the number of calendar days between the date of award and the date of completion as designated in the proposal without regard to any extension of time. These amounts may be deducted from any monies due to the Contractor on this Contract.

B. If the Contractor fails to maintain and protect traffic adequately and safely for a period of 24 hours, the Owner may correct the adverse conditions by the use of Municipal Forces, augmented if necessary, by other equipment and personnel as it may be necessary to hire, and the entire cost of this work by such forces shall be deducted from any monies due the Contractor on this contract. The cost of this work shall be in addition to daily non-payment deductions listed above, and shall not be limited to the lump sum bid amount for this item.

4.3 PAYMENT:

- A. Maintenance and Protection of Traffic shall be paid for on a lump sum basis; at the price bid for this item, less any deductions for the unsatisfactory accomplishment, as determined above. The price bid shall include the cost of furnishing all labor, materials and equipment necessary to satisfactorily complete the work and comply with all requirements herein.
- B. If no separate Payment Item is provided in the Proposal for Maintenance and Protection of Traffic, then all work required under this Section shall be deemed included under the other payment items of the Proposal.
- C. Price bid shall also include the cost of any detour, temporary pavement or temporary structure not shown on the plans or in the proposal. Payments will be made for this item in proportion to the total amount of work completed, less any amounts deducted for unsatisfactory accomplishment.
- D. In view of the difficulty of accurately ascertaining the cost to the Owner in indirect impacts as caused by the Contractor's failure to properly accomplish this item of work, any monies deducted for unsatisfactory accomplishment shall not be refundable to the Contractor in any case.
- E. The amount of actual costs incurred by the Owner (and reimbursement thereof) to properly maintain and protect traffic upon the failure of the Contractor to do so shall not be limited to the amount bid by the Contractor in the Proposal.

END OF SECTION 015500 (NY)

SECTION 015719 - ENVIRONMENTAL PROTECTION DURING CONSTRUCTION

PART 1 - GENERAL

1.1 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the General Conditions to the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.

1.2 REQUIREMENTS INCLUDED

- A. Scope
- B. Applicable Regulations
- C. Notification
- D. Implementation
- E. Protection of Land Resources
- F. Recording and Preserving Historical and Archaeological Finds
- G. Protection of Water Resources
- H. Burning
- I. Dust and Mud Control
- J. Maintenance of Pollution Control Facilities During Construction

1.3 SCOPE

A. The work covered by this section consists of furnishing all labor, material and equipment and performing all work required for the prevention of environmental pollution during and as the result of construction operations under this contract except for those measures set forth in other Technical Provisions of these specifications.

For the purpose of this specification environmental pollution is defined by regulatory authorities as the presence of chemical, physical or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic and recreational purposes.

The control of environmental pollution requires consideration of air, water and land, and involves noise, solid waste-management and management of radiant energy and radioactive materials, as well as other pollutants.

B. Compliance with the provisions of this section by all Subcontractors shall be the responsibility of the Contractor.

1.4 APPLICABLE REGULATIONS

A. In order to provide for abatement and control of any environmental pollution arising from the construction activities of the Contractor and his subcontractors in the performance of this contract, they shall comply with all

applicable Federal, State and local laws, and regulations concerning environmental pollution control and abatement as well as the specific requirements stated elsewhere in the contract specifications.

1.5 NOTIFICATION

A. The Architect will notify the Contractor in writing of any non-compliance with the foregoing provisions. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Architect may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost on account of any such stop orders shall be made the subject of a claim for extension of time or for extra costs or damages by the Contractor unless it was later determined that the Contractor was in compliance.

1.6 PROTECTION OF LAND RESOURCES

- A. It is intended that the land resources within the project boundaries and outside the limits of permanent work performed under this contract be preserved in their present condition or be restored to a condition after completion of construction that will appear to be natural and not detract from the appearance of the project. Insofar as possible, the Contractor shall confine his construction activities to areas defined by the plans or specifications.
- B. The following additional requirements are intended to supplement and clarify the requirements contained in the General Conditions.

The location on the project site of the Contractor's storage and other construction buildings, required temporarily in the performance of the work, shall be upon assigned portions of the job site and shall require written approval of the Architect.

The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the overall construction of buildings.

Plans showing storage and office facilities shall be submitted for approval of the Architect.

- C. If the Contractor proposes or is required to construct temporary roads or embankments and excavations for plant and/or work areas, he shall submit the following for approval at least 21 days prior to scheduled start of such temporary work.
 - 1. A layout of all temporary access roads, excavations and embankments to be constructed with the work area.
 - 2. Plans and cross sections of proposed embankments and their foundations, including a description of proposed materials.

1.7 RECORDING AND PRESERVING HISTORICAL AND ARCHAEOLOGICAL FINDS

A. All items having any apparent historical or archaeological interest which are

discovered in the course of any construction activities shall be carefully preserved. The Contractor shall leave the archaeological find undisturbed and shall immediately report the find to the Architect so that the proper authorities may be notified.

1.8 PROTECTION OF WATER RESOURCES

- A. The Contractor shall not pollute streams, lakes, reservoirs or public waters with fuels, oils, bitumens, calcium chloride, acids or harmful materials. It is the responsibility of the Contractor to investigate and comply with all applicable Federal, State, County and Municipal laws concerning pollution of surrounding public waters. All work under this contract shall be performed in such a manner that objectionable conditions will not be created in public waters through or adjacent to the project areas.
- B. Prior to any major construction the Contractor shall submit a plan for approval by the Architect showing his scheme for controlling erosion and disposing of waste.
- C. Surface drainage from cuts and fills within the construction limits, whether or not completed, and from borrow and waste disposal areas, shall, if turbidity producing materials are present, be held in suitable sedimentation ponds or shall be graded to control erosion within acceptable limits.

Temporary erosion and sediment control measures such as berms, dikes, drains, or sedimentation basins, if required to meet the above standards, shall be provided until permanent drainage and erosion control facilities are completed and operative.

Fills and waste areas shall be constructed by selecting placement to eliminate silts or clays on the surface that will erode and contaminate adjacent public waters.

- D. At all times of the year, special measures shall be taken to prevent chemicals, fuels, oils, grease, bituminous materials, waste washings, herbicides and insecticides, and cement and surface drainage from entering public waters
- E. Disposal of any materials, wastes, effluents, trash, garbage, oil, grease, chemicals, etc., in areas adjacent to public waters shall be subject to the approval of the Architect. If any waste material is dumped in unauthorized areas the Contractor shall remove the material and restore the area to the condition of the adjacent undisturbed area. If necessary, contaminated ground shall be excavated, disposed of as directed by the Architect, refilled with clean material and compacted all at the expense of the Contractor.

1.9 BURNING

A. Burning will not be permitted.

1.10 DUST AND MUD CONTROL

A. The Contractor shall at all times provide adequate dust control measures. He shall accomplish this, without interference to the public and vehicular transportation.

- B. To control dust, it is required that all vehicles transporting dust producing materials to and from the job shall be covered with tarpaulins securely tied down, be sprinkled when necessary or be satisfactorily treated by other approved methods.
- C. Trucks leaving excavations shall be water washed prior to entry on access roads or public streets to remove mud and other deleterious substances from wheels and undercarriages.
- D. All public and private ways adjacent to the site shall be broomed and flushed whenever necessary in the opinion of the Architect. Drainage systems shall be cleaned and flushed whenever mud or debris hinders the flow of storm water to or in the sewers.
- E. The Contractor shall immediately remove refuse, rubbish, debris and soil accumulations on roads, streets and on sidewalks, caused by wind, rain and snow erosions or by his own operations to prevent traffic hazards or interference with road drainage.

1.11 MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING CONSTRUCTION

A. During the life of this contract the Contractor shall maintain all facilities constructed for pollution control under this contract as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created. During the construction period the Contractor shall conduct frequent training courses for his maintenance personnel. The curriculum shall include methods of detection of pollution, familiarity with pollution standards, and installation and care of vegetation covers, plants and other facilities to prevent and correct environmental pollution.

End of Section

SECTION 016100 - MATERIAL AND EQUIPMENT

1.1 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the General Conditions and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.

1.2 REQUIREMENTS INCLUDED

- A. General Standards
- B. Products
- C. Sustainability
- D. Transportation and Handling
- E. Storage and Protection

1.3 GENERAL STANDARDS APPLICABLE TO ALL SPECIFICATION SECTIONS

- A. These provisions, standards, and tolerances shall apply to all work under this Contract. Where stricter standards and tolerances are specified elsewhere in these Specifications or in references specified in these Specifications, they shall take precedence over these standards and tolerances.
- B. Build and install parts of the Work level, plumb, square, and in correct position unless specifically shown or specified otherwise.
 - 1. No part shall be out of plumb, level, square, or correct position so much as to impair the proper functioning of the part or the Work as judged by the Architect.
 - No part shall be out of plumb, level, square, or correct position so much as to impair the aesthetic effect of the part or the Work as judged by the Architect.
- C. Make joints tight and neat. Provide uniform joints in exposed work. Arrange joints to achieve the best visual effect. Refer choices of questionable visual effect to the Architect.
- D. Under potentially damp conditions, provide galvanic insulation between different metals which are not adjacent on the galvanic scale.
- E. Manufacturers, subcontractors, and workmen shall be experienced and skillful in performing the work assigned to them.
- F. All paint used on all products shall conform to ANSI Z66.1, Specifications for Paints and Coatings Accessible to Children to Minimize Dry Film Toxicity.
- G. The Drawings do not attempt to show every item of existing work to be demolished and every item of repair required to existing surfaces. Perform work required to remove existing materials which are not to be saved and to restore existing surfaces to condition equivalent to new as judged by Architect. If possible, repairs shall be indistinguishable from adjacent sound surfaces. Where it is impossible to achieve repairs, which are indistinguishable from adjacent sound surfaces to remain, notify Architect in writing, and proceed according to his instructions.

1.4 PRODUCTS

- A. Products include material, equipment and systems.
- B. Comply with Specifications and referenced standards as minimum requirements.
- C. Components required to be supplied in quantity within a Specification Section shall be the same and shall be interchangeable.
- D. In the case of an inconsistency between Drawings and the Specifications, or within either document which is not clarified by addendum, the product of greater quality or greater quantity of work shall be provided in accordance with the Designer's interpretation.
- E. Provide environmentally preferable products to the greatest extent possible. To the greatest extent possible, provide products and materials that have a lesser or reduced effect on the environment considering raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, and/or disposal of the product.

1.5 SUSTAINABILITY

- A. In the selection of the products and materials of this section as well as for the entire project, preference will be given to those with the following characteristics:
 - 1. Water based
 - 2. Water-soluble
 - 3. Can be cleaned up with water
 - 4. Non-flammable
 - 5. Biodegradable
 - 6. Low or preferably no Volatile Organic Compound (VOC) content
 - 7. Manufactured without compounds that contribute to ozone depletion in the upper atmosphere
 - 8. Manufactured without compounds that contribute to smog in the lower atmosphere
 - 9. Do not contain methylene-chloride
 - 10. Do not contain chlorinated hydrocarbons
 - 11. Contains the least possible of post-consumer or post- industrial waste

1.6 TRANSPORTATION AND HANDLING

- A. Arrange deliveries of materials in accordance with construction schedules in order to avoid delay in, conflict with, or the impeding of the progress of the Work and conditions at the site. Deliveries shall be made during regular work hours, unless approved otherwise by the Owner.
- B. Deliver materials in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

1.7 STORAGE AND PROTECTION

A. Store materials in accordance with manufacturer's instructions, with seals and labels accessible for inspection.

Contractor shall be responsible for work and equipment until fully inspected, tested and accepted. Carefully store materials and equipment which are not immediately installed after delivery to site. Close open ends of work with temporary covers or plug during construction to prevent entry of obstructing material or damaging water.

- B. Materials stored on the Site shall be neatly arranged and protected and shall be stored in an orderly fashion in locations that shall not interfere with the progress of the Work or with the operations of the Owner.
- C. Interior Storage: Maintain temperature and humidity within the ranges required by manufacturer's instructions.

<u>NOTE</u> - Should it become necessary during the course of the Work to move materials or equipment stored on the Site, the Contractor, at the direction of the Architect, shall move such material or equipment.

D. Protection After Installation

- 1. Provide adequate coverings to protect installed materials from damage resulting from natural elements, traffic, and subsequent construction.
- 2. Remove when no longer needed.

End of Section

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.1 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the General Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Definitions as apply to "Contractors" involved with the work of this Project shall be as set forth in Section 10 10 00, Article 1.01
- D. Any and all "Waste Handlers and Haulers" shall be licensed by the Authority having jurisdiction over "Solid Waste Management" and a copy of said license shall be submitted in accordance with Article 1.05 herein.

1.2 DESCRIPTION OF WORK

A. This Section specifies requirements for a complete program for implementation of waste management controls and systems for the duration of the Work.

1.3 INTENT

- A. The Owner has established that this Project shall generate the least amount of waste practical and that processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors shall be employed.
- B. Of the waste that is generated, as many of the waste materials as economically feasible shall be reused, salvaged, or recycled. Waste disposal in landfills shall be minimized to the greatest extent practical. With regard to these goals each Contractor shall develop, for Owner's Representative's review and Architect's review, a Waste Management Plan for this Project. Contractor shall be responsible for segregating his/her waste into different dumpsters. Contractor shall be responsible for ensuring that debris will be disposed of at appropriately designated licensed solid waste disposal facilities, as defined by governing laws of the jurisdiction of the Work.

1.4 WASTE MANAGEMENT PLAN

- A. Waste Management Plan: Contractor shall provide a plan containing the following:
 - 1. Analysis of the proposed jobsite waste to be generated, including types and rough quantities.
 - 2. Landfill Options: The name of the landfills where trash and building debris will be disposed of, the applicable landfill tipping fees, and the projected cost of disposing of all Project waste in the landfills.
 - Landfill Certification: Contractor's statement of verification that landfills

- proposed for use are licensed for types of waste to be deposited and have sufficient capacity to receive waste from this project.
- 4. Alternatives to Landfilling: A list of each material proposed to be salvaged or recycled during the course of the Project. Include the following and any additional items proposed:
 - Cardboard a.
 - b. Clean dimensional wood
 - Beverage containers C.
 - d. Concrete
 - Bricks and masonry e.
 - f. Asphalt
 - Metals from framing, banding, stud trim, ductwork, piping, g. rebar, roofing, other trim, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze
 - Glass, colored glass allowed h.
 - Plastic i.
 - 1. Type 1: Polyethylene Terephthalate (PET, PETE)
 - 2. Type 2: High Density Polyethylene (HDPE)
 - Type 3: Vinyl (Polyvinyl Chloride or PVC) 3.
 - Type 4: Low Density Polyethylene (LDPE) 4.
 - Type 5: Polypropylene (PP) 5.
 - 6. Type 6: Polystyrene (PS)

 - Type 7: Other. Use of this code indicates that the package 7. in question is made with a resin other than the six listed above or is made of more than one resin listed above and used in a multi-layer combination.
 - Paint and paint cans j.
 - k. Insulation
 - Others as appropriate
- 5. Meetings: A description of the regular meetings to be held to address waste management.
- 6. Materials Handling Procedures: A description of the means by which any waste materials identified above will be protected from contamination, and a description of the means to be employed in recycling the above materials consistent with requirements for acceptance by designated facilities.
- Transportation: A description of the means of transportation of the 7. recyclable materials (whether materials will be site-separated and selfhauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site) and destination of materials.

1.5 **SUBMITTALS**

- Α. Construction Waste Management Plan: Submit 3 copies of plan within 21 days of date established for the Notice to Proceed.
- B. Calculations and supporting documentation to demonstrate end-of-project

- recycling rates meeting the requirements for Construction Waste Management Plan of Item above.
- C. For materials separated for recycling off-site, establish a method for tracking the weight of the recycled material. The method shall be included in the CWM Plan for the Architect's review and approval.
- D. Waste Reduction Progress Reports: Concurrent with the Applications for Payment, submit three copies of report. Include monthly tabulations for demolition and construction waste sent off-site for disposal or recycling.
- E. Waste haulers solid waste management license.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 RECYCLING

- A. Metal, including but not limited to aluminum stairs, structural beams and sections, and reinforcing steel shall be recycled.
- B. Wood that is not painted and does not contain preservatives (i.e. creosote, arsenic, and chromium-containing preservatives) shall be segregated and recycled.

3.2 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. All sorting will be done "off-site" by a recognized construction and demolition processing facility who will be responsible for provision of all documentation as to where loads were processed, and the recycling rate achieved.
- B. Hazardous Wastes: Any unforeseen hazardous wastes shall be separated, stored, and disposed of according to local regulations.

End of Section

SECTION 017700 - PROJECT CLOSE OUT

1.1 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the General Conditions and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.

1.2 REQUIREMENTS INCLUDED

- A. Final Cleanup
- B. Required Close Out Documentation
- C. Project Close Out Inspections

1.3 FINAL CLEANUP

- A. The Contractor shall leave the work ready for use and occupancy without the need of further cleaning of any kind.
- B. The Contractor shall remove all tools, appliances, project signs, material and equipment from the phased areas as soon as possible upon completion of the work.
- C. The work is to be turned over to the Owner in new condition, in proper repair and in perfect adjustment to the satisfactions of the Owner.

1.4 REQUIRED CLOSE OUT DOCUMENTATION

- A. Prior to final payment the Owner shall receive, in addition to those documents required by the General Conditions, the following:
 - 1. Project record documents as per Section 01 77 19
 - 2. The Contractor's general guarantees
 - 3. Specific guarantees of material, equipment and systems installed in the work. A copy of all test data taken in connection with the work.
 - 4. Copies of all Certification of Specifications Compliance as per Section 01 33 00
 - 5. Record of Material Safety Data Sheets (MSDS)
 - 6. Certified Payroll Records

1.5 PROJECT CLOSE OUT INSPECTIONS

- A. When the Work has reached such a point of completion that the building or buildings, equipment, apparatus or phase of construction or any part thereof required by the Owner for occupancy or use can be so occupied and used for the purpose intended, the Contractor, prior to notification to the Architect, shall make a preliminary inspection of the Work to insure that all the requirements of the Contract have been met and the Work is substantially complete and is acceptable. Upon such notification, the Architect shall make a detailed inspection of the Work to ensure that all the requirements of the Contract have been met and that the Work is complete and is acceptable.
- B. A copy of the report of the inspection shall be furnished to the Contractor as the inspection progresses so that the Contractor may proceed without delay

- with any part of the Work found to be incomplete or defective.
- C. When the items appearing on the report of inspection have been completed or corrected, the Contractor shall so advise the Architect. After receipt of this notification, the Architect shall inform the Contractor of the date and time of final inspection. A copy of the report of the final inspection containing all remaining contract exceptions, omissions and incompletions shall be furnished to the Contractor.
- D. After the receipt of notification of completion and all remaining contract exceptions, omissions and incompletions from the Contractor, the Architect will reinspect the Work to verify completion of the exception items appearing on the report of final inspection.
- E. Upon completion of reinspection, the Architect will prepare a certificate of final acceptance or will furnish to the Contractor a copy of the report of the Architect's reinspection detailing Work that is incomplete or obligations that have not been fulfilled but are required for final acceptance.

End of Section

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SECTION 017719 - PROJECT RECORD DOCUMENTS

1.1 GENERAL

- A. Requirements set forth herein are in addition to and shall be considered as complementary to the General Conditions of the Contract and the balance of Division #1 and Technical Specifications.
- B. All Contractors, Subcontractors, Sub-subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.
- C. Definitions as apply to "Contractors" involved with the work of this Project shall be as set forth in Section 01 10 00, Article 1.01.

1.2 REQUIREMENTS INCLUDED

- A. Project Record Drawings
- B. Record Drawing Certification

1.3 PROJECT RECORD DRAWINGS

A. The purpose of the project drawings is to record the actual location of the work in place including but not limited to underground lines, concealed piping within buildings, concealed valves and control equipment, and to record changes in the work.

In addition to the above, these drawings shall be "color-coded", by each trade, on a daily basis to indicate progress of the work. Color legend will be assigned by the Architect.

B. In addition to the sets of contract drawings that are required by the Contractor on the site to perform the work, the Contractor shall maintain, at the site, one (1) copy of all drawings, specifications and addenda that are part of the Contract as awarded.

Each of these documents should be clearly marked "Project Record Copy", maintained in a clean and neat condition available at all times for inspection by the Owner or the Architect, and shall not be used for any other purpose during the progress of the work.

The Architect will be the custodian of the project record documents until the end of the Project.

C. Project Record Requirements

- 1. The Contractor shall mark up the "Project Record Copy" to show:
 - a. Approved changes in the work
 - b. Location of underground work and concealed work
 - c. Details not shown in the original Contract Documents
 - d. Any relocation of work including piping, conduits, ducts and the like
 - e. All changes in dimensions
 - f. All access doors and "tack" locations access points in accessible ceilings
 - g. Location of all plumbing, heating, ventilating, air conditioning or

electrical assemblies, whether existing to remain or newly installed

- h. Revisions to any electrical circuitry
- 2. Such information shall include, but shall not be limited to:
 - a. Footing depth in relation to finished grade elevations
 - b. Any change in floor elevations
 - c. Any structural changes
 - d. Any substitutions
 - e. Elevations and locations of all underground utilities, services, or structures referenced to permanent above ground structures or monuments
 - f. Designation of all utilities as to the size and use of such utilities
 - g. All invert elevations of manholes
 - h. The location of all utilities, services and appurtenances concealed in building structures that have been installed differently from that required by the Contract
 - i. Any and all approved change orders

and other such data as required by the Architect and/or Owner so as to establish a complete record of "As-Constructed" conditions.

- D. The Contractor shall keep the project record documents up-to-date from day to day as the work progresses. Appropriate documents are to be updated promptly and accurately; no work is to be permanently concealed until all required information has been recorded.
- E. The project record drawings are to be submitted by the Contractor to the Architect when all the work is completed and is approved by the Owner and the Architect before the Contractor may request final payment.

If the project record drawings as submitted are found to be unacceptable due to incompleteness or inaccurate information, the drawings shall be returned to the offending Contractor for corrective action and resubmitted for approval prior to the release of final payment.

FINAL PAYMENT IS CONTINGENT UPON PREPARATION OF FINAL PROJECT RECORD DRAWINGS ON A SET OF "PRINTS" and CAD DISKETTES IN "DXF" or "DWG" FORMAT AS APPROVED BY THE OWNER (A SET OF BASE DISKETTES WILL BE FURNISHED BY THE ARCHITECT) AND SUBMITTAL OF SAME TO THE OWNER, THROUGH THE ARCHITECT.

F. In addition to the drawings required as mentioned above, the Contractor shall submit a list of all approved Shop Drawings of the Work as installed.

From this list the Architect will select the drawings desired for permanent records. The Contractor shall furnish these in a bound set to the Owner as part of the closeout requirements.

1.4 RECORD DRAWING CERTIFICATION

A. The record drawings required under the terms and conditions of this Section shall be reviewed and processed by each of the Prime Contractors as part of their overall contractual responsibility.

B.

document to cover the entire record drawing requirements of the project. The format of this certification shall be as follows: These record drawings prepared by:	
reviewed by the undersigned and:	
Appear to be an accurate representation of the work incorproject and are accepted as submitted in accordance with the tec	•
This record document review made by this office is for determination of the requirements of the contract documents.	of compliance to
Firm Name:	
Review Date:By:	

End of Section

This certification may be issued for individual trades or as a collective

SECTION 019113 - GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL

- A. Section includes general requirements that apply to implementation of commissioning without regard to specific systems, assemblies, or components. Commissioning is intended to achieve the following specific objectives according to the Contract Documents:
- B. Commissioning is intended to verify and document proper installation and intended full performance of building equipment, systems, and integrated systems.
- C. The Owner will engage the Commissioning Agent (CxA) under a separate contract.
- D. Refer to Specification Divisions 22, 23, 26, and 28 for additional requirements.

1.2 COMMISSIONING TEAM

- A. Members Appointed by Contractor(s): Individuals, each having the authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated action. The commissioning team shall consist of, but not be limited to, representatives of Contractor, including Project Superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the CxA.
- B. Members Appointed by Owner:
 - 1. CxA: The designated person, company, or entity that plans, schedules, and coordinates the commissioning team to implement the commissioning process.
 - 2. Representatives of the facility user and operation and maintenance personnel.
 - 3. Construction Manager
 - 4. Architect and Engineering design professionals.

1.3 INCLUDED SYSTEMS AND EQUIPMENT

- A. Mechanical Systems including but not limited to Rooftop Units, Exhaust Air Systems and Fans, Energy Recovery Units, Split System Air Conditioners, Variable-Refrigerant Flow HVAC Systems, Hydronic Air Coils, Unit Ventilators, Unit Heaters, Fan Coil Units, Piping and Valves, Ducts and Dampers, Water Distribution Pumps and the Building Automation System. Refer to section 230800 "Commissioning of HVAC" for additional requirements.
- B. Plumbing Systems including but not limited to Domestic Hot System and Elevator Sump Pump System. Refer to section 220800 "Commissioning of Plumbing" for additional information.
- C. Electrical Systems including but not limited to Lighting Controls and Fire-Alarm System. Refer to sections 260800 "Commissioning of Electrical Systems" and 280800 "Commissioning of Digital, Addressable Fire Alarm System".

1.4 OWNERS RESPONSIBILITIES

- A. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities.
- B. Provide the Basis of Design documentation, prepared by Architect/Engineer and

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approved by Owner, to the CxA and Contractor for use in developing the commissioning plan, systems manual, and operation and maintenance training plan.

1.5 CONTRACTORS RESPONSIBILITIES

- A. Contractor shall assign representatives with expertise and authority to act on its behalf and shall schedule them to participate in and perform commissioning process activities including, but not limited to, the following:
 - 1. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
 - 2. Cooperate with the CxA for resolution of issues recorded in the Issues Log.
 - 3. Attend commissioning team meetings held on a variable basis.
 - 4. Integrate and coordinate commissioning process activities with construction schedule.
 - 5. Review and accept construction checklists provided by the CxA.
 - 6. Complete electronic construction checklists as Work is completed and provide to the Commissioning Authority on a weekly basis.
 - 7. Review and accept commissioning process test procedures provided by the Commissioning Authority.
 - 8. Provide all specialized tools, test equipment and instruments required to execute startup, checkout, and testing of equipment
 - 9. Complete commissioning process test procedures.
 - 10. Successful Commissioning requires that installation of all building systems complies with Contract Document requirements and that full operational check-out and necessary adjustments are performed prior to Substantial Completion, with the exception of deferred tests approved in advance by Owner.
 - 11. Contractor shall incorporate all commissioning and closeout documentation and/or verification into a Commissioning and Closeout Manual for the Owner as specified. The manual submitted to Owner must contain all documentation related to the Commissioning process, including but not limited to: all checklists, calibrations, related correspondence, test procedures and results, deficiency reports, data trends, punch lists, and signoffs.

1.6 CxA'S RESPONSIBILITIES

- A. Organize and lead the commissioning team.
- B. Organize and lead commissioning team meetings.
- C. Review submittals as an aid in development of functional testing procedures, to verify compliance with equipment specifications and to advise the Owner, Contractor, and A/E on overlooked procedures or issues with the submittals
- D. Provide project-specific construction checklists and commissioning process test procedures. Develop Pre-functional and Functional Performance Tests based on submitted products and submit to Project Team for review and comment
- E. CxA shall witness any startup and preliminary equipment testing.
- F. Verify the execution of commissioning process activities using random sampling. The sampling rate may vary from 1 to 100 percent. Verification shall include, but is not limited to, equipment submittals, construction checklists, training, operating and maintenance data, tests, and test reports. When a random sample does not meet

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- the requirement, the CxA will report the failure in the Issues Log.
- G. Prepare and maintain completed construction checklist log.
- H. Prepare and maintain the Issues Log.

PART 2 - PRODUCTS

2.1 All specialized tools, test equipment and instruments required to execute start-up, checkout, and testing of equipment shall be of sufficient quality and accuracy to test and/or measure system performance within manufacturer's specified tolerances.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor(s) shall inform the Construction Manager approximately 6 to 8 weeks prior to the commencement of equipment start-ups. At that time, the CxA shall conduct a commissioning functional testing schedule meeting with the Commissioning Team in order to establish a coordinated approach to the integration of the function testing activities within the master construction schedule.
- B. Each system shall be operated through all modes of operation (seasonal, occupied, unoccupied, warm-up, cool-down, part- and full-load, etc.) where there is a specified system response. Systems shall also be tested under "black start" conditions in which all systems are powered down to verify correct transition and start-up of systems under emergency power conditions. Verifying each sequence in the specified sequence of operation is required including responses to conditions such as power failure, freeze condition, low oil pressure, no flow, equipment failure, etc.
- C. Each contractor shall comprehensively test all systems for which they are responsible to provide to the project. Systems that contain many repeated identical devices may be selected and demonstrated to the project team based on a sampling strategy at the option of the Owner. However, no fewer than 20 percent of any group of identical devices shall undergo functional testing.
- D. Opposite Season Testing: Testing procedures shall be repeated and/or conducted as necessary during appropriate seasons. "Opposite season" testing is primarily for environmental systems and shall be required where scheduling prohibits thorough testing in all modes of operation. Air Handler and Central heating system testing for heating related modes of operation and control loops shall be tested when there is an adequate differential temperature between the outside air and the conditional air within the facility to place a demand on the operational systems. The CxA shall schedule the opposite season testing during the warranty period to coincide with a design day condition when possible.
- E. CxA shall document results of Functional Performance Test to FPT forms.

 Deficiency or nonconformance issues shall be noted and reported to commissioning team as a punchlist item with specific responsibility indicated.

 Corrections of minor deficiencies identified may be made during testing at discretion of CxA. In such case, deficiency and resolution shall be documented on procedure form and to punch list as a resolved issue.

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F. Contractors shall be held responsible for expenses incurred by Owner for retesting due to the Contractor's state of reported readiness or lack thereof as represented on the checklists. Cost to recheck checklist or re execute Functional Performance Test, if Contractor is responsible for deficiency or failure, shall be Contractor's.

End of Section

SECTION 023000 - SUBSURFACE INVESTIGATION

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.2 SUBSURFACE INVESTIGATION

- A. Information Not Guaranteed: Information on the Drawings and in the Project Manual relating to subsurface conditions, natural phenomena, and existing utilities and structures is from the best sources presently available. Such information is furnished only for the information and convenience of the Contractor, and the accuracy or completeness of this information is not guaranteed.
- B. Foundation Engineering Report: Refer to the Geotechnical Report in the Appendices.

1.3 CONFIRMATION OF GRADES AND UTILITIES

- A. Prior to commencement of site excavating operations, the Contractor shall compare existing site grading and proposed new site grading. Where existing utilities are indicated but their inverts or depths are not, exploratory excavating shall be performed to assure that sufficient earth coverage will be attained during the course of new site grading.
 - 1. Utilities existing on the site shall be carefully protected from damage and relocated or removed as required by the work. When an active utility line is exposed during construction, its location and elevation shall be plotted on the record drawings and the Architect, Owner and the utility owner notified in writing.
- B. If exploratory excavating confirms that the depth of existing utilities will be negatively impacted by proposed new grades (i.e., will be too shallow or become exposed), immediately notify the Architect and the Owner. Do not proceed with work in such areas until instructions are issued by the Architect. Continue work in other areas.

1.4 CONFIRMATION OF INTEGRITY OF ADJACENT STRUCTURES

A. Prior to commencement of site excavating operations, the Contractor shall compare foundation depths of existing structures and proposed depths of new utilities. Where existing structures are indicated but their foundation depths are not, exploratory excavating shall be performed to assure that proposed new excavations adjacent to them, or in near proximity of them, will not undermine the structural integrity of the existing structures.

B. If exploratory excavating confirms that the footing depths of existing structures may be negatively impacted or undermined by proposed new excavations, immediately notify the Architect and the Owner. Do not proceed with work in such areas until instructions are issued by the Architect. Continue work in other areas.

PART 2 - PRODUCTS [Not Used]

PART 3 - EXECUTION [Not Used]

END OF SECTION

SECTION 024100 - DEMOLITION

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included:

- 1. Demolition and removal of selected portions of buildings and structures and as required for new work. Refer to the Drawings for additional requirements.
- 2. Demolition and removal of selected site elements and as required for new work. Refer to the Drawings for additional requirements.
- 3. Full gut demolition at interior.
- 4. Salvage of existing items to be reused or turned over to the facility.
- 5. Removal and legal disposal of demolished materials off site. Except those items specifically designated to be relocated, reused, or turned over to the facility, all existing removed materials, items, trash and debris shall become property of the Contractor and shall be completely removed from the site and legally disposed of at their expense. Salvage value belongs to the Contractor. On-site sale of materials is not permitted.
- 6. Maintenance, watering and care of trees designated to remain by a certified arborist during the construction period.
- 7. Demolition and removal work shall properly prepare for alteration work and new construction to be provided under the Contract.
- 8. Scheduling and sequencing operations without interruption to utilities serving occupied areas. If interruption is required, obtain written permission from the utility company and the Owner.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - Section 011000 GENERAL REQUIREMENTS for temporary facilities and controls, for maintenance of access, for cleaning during construction, and for dust and noise control.
 - Section 017419 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL:
 - a. Waste management and recycling.
 - 3. Division 21 FIRE PROTECTION:

- Disconnecting, capping and otherwise making inactive existing fire protection services in areas where demolition and removal work is required.
- b. Disconnect and reinstallation of fire protection equipment temporarily interrupted during construction.

4. Division 22 - PLUMBING:

- a. Disconnecting, capping and otherwise making inactive existing plumbing services in areas where demolition and removal work is required.
- b. Disconnection and reinstallation of plumbing equipment temporarily interrupted during construction.

5. Division 23 - HEATING, VENTILATING AND AIR CONDITIONING:

- a. Disconnecting, capping and otherwise making inactive existing HVAC services in areas where demolition and removal work is required.
- b. Disconnect and reinstallation of HVAC equipment temporarily interrupted during construction.

6. Division 26 - ELECTRICAL WORK:

- a. Disconnecting, capping and otherwise making inactive existing electrical services in areas where demolition and removal work is required.
- b. Disconnect and reinstallation of electrical equipment temporarily interrupted during construction.

7. Section 311000 – SITE CLEARING:

a. Excavating and removal of existing pavement, sub-surface building and utility structures and lines, appurtenances, and other elements indicated on the Drawings.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to the Owner ready for reuse, at a location designated by the Owner. Protect from weather until accepted by Owner.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated. Protect from weather until reinstallation.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques, antiques, and other items of interest or value to Owner that may be encountered during selective demolition remain property of the Owner as applicable. Carefully remove each item or object in a manner to prevent damage and deliver promptly to a location acceptable to the Owner.

1.5 SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with early and late starting and finishing dates for each activity. Ensure Owner's on-site operations are uninterrupted if applicable.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Use of elevator and stairs.
 - 5. Locations of proposed dust- and noise-control temporary partitions and means of egress, including for other occupants affected by selective demolition operations.
 - 6. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
 - 7. Means of protection for items to remain and items in path of waste removal from building.
- B. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged, and turned over the Owner.
- C. Predemolition Video and Pictures: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Comply with Division 01 requirements. Submit before Work begins.

1.6 QUALITY ASSURANCE

- A. Examination of Existing Conditions: The Contractor shall examine the Contract Drawings for demolition and removal requirements and provisions for new work. Verify all existing conditions and dimensions before commencing work. The Contractor shall visit the site and examine the existing conditions as he finds them and shall inform herself/himself of the character, extent and type of demolition and removal work to be performed. Submit any questions regarding the extent and character of the demolition and removal work in the manner and within the time period established for receipt of such questions during the bidding period.
- B. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.
- E. Predemolition Conference: Conduct conference at Project site to comply with requirements in Section 011000 GENERAL REQUIREMENTS, Project Meetings. Review methods and procedures related to selective demolition including, but not limited to, the following:
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review structural load limitations of existing structure.
 - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - 5. Review areas where existing construction is to remain and requires protection.

1.7 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 SALVAGING

- A. Salvaged for Reinstallation: Materials indicated on the Drawings to be salvaged and reinstalled shall be carefully removed and stored at a location acceptable to the Architect and Owner.
- B. Salvaged for Storage: Materials indicated on the Drawings or designated in the field by the Owner to be salvaged and stored shall be carefully removed and delivered to the Owner at locations determined by Owner.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Engage a professional engineer registered in the state that the project is located to survey 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 demolition operations.
- F. Survey of Existing Conditions: Record existing conditions by use of preconstruction videotapes.
 - Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.
- G. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with utility companies and Owner.
 - 2. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing. Where entire wall is to be removed, existing services/systems may be removed with removal of the wall.
 - 4. Prior to commencing cutting work in existing surfaces, take all precautionary measures to assure that mechanical and electrical services to the particular area have been made inactive. Coordinate with Fire Suppression, Plumbing, HVAC, and Electrical subcontractors. Only licensed tradesmen of that particular trade shall disconnect and cap existing mechanical and electrical items that are to be removed, abandoned and/or relocated.
 - 5. If, during the process of cutting work, existing utility lines are encountered which are not indicated on the Drawings, regardless of their condition, immediately report such items to the Architect. Do not proceed with work in such areas until instructions are issued by the Architect. Continue work in other areas.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debrisremoval operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - Comply with requirements for access and protection specified in Section 011000
 GENERAL REQUIREMENTS, Temporary Facilities and Controls.
 - 2. Maintain adequate passage to and from all exits at all times. Before any work is done which significantly alters access or egress patterns, consult with the Architect and obtain approval of code required egress. Under no condition block or interfere with the free flow of people at legally required exits, or in any way alter the required condition of such exits.
- B. Temporary Shoring: 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.
 - 1. Strengthen or add new supports when required during progress of selective demolition.
 - 2. Remove temporary shoring, bracing and structural supports when no longer required.
 - 3. Post warning signs and place barricades as applicable during placement and removal of temporary shoring.
- C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around demolition area(s).
 - 1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction. Provide temporary barricades as required to limit access to demolition areas.
 - 2. Protect existing site improvements, appurtenances, and landscaping to remain.

3.4 SELECTIVE DEMOLITION, GENERAL

- 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. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 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, to minimize disturbance of adjacent
 surfaces. Temporarily cover openings to remain.

- 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
- 4. 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 fire watch and portable fire-suppression devices during flame-cutting operations.
- 5. Maintain adequate ventilation when using cutting torches.
- 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
- 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
- 8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- 9. Maintain clear unimpeded passage through the work area for safety and emergency egress.
- Saw cut overruns in concrete and masonry for new door, window and other finish openings is not permitted. Core drill corners and finish square to match required opening.
- 11. Dispose of demolished items and materials promptly.
 - a. Comply with requirements in Section 017400 CONSTRUCTION WASTE MANAGEMENT.
- B. 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 storage area designated by the Owner.
 - 5. Protect items from damage during transport and storage.
- C. Removed Items for Reinstallation by the Respective Trade.
 - 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 storage area designated by the Owner.
 - 5. Protect items from damage during transport and storage.
- D. 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 cleaned and reinstalled in their original locations after selective demolition operations are complete.
- E. Items for Re-use and Preservation of Existing Surfaces to Remain:
 - 1. The Contractor shall inspect closely each item specifically designated to be relocated, re-used, or turned over to the Owner prior to its removal, and

- immediately report damages and defects to the Architect and the Owner. The Contractor shall be responsible for any subsequent damage to the same other than latent defects not readily apparent from close inspection, and shall bear responsibility for its repair or same replacement as directed by the Architect, to the satisfaction of the Owner.
- 2. Unless special surface preparation is specified under other Specification Sections, leave existing surfaces that are to remain in a condition suitable to receive new materials and/or finishes.

3.5 PROTECTION OF PUBLIC AND PROPERTY

- A. Provide all measures required by federal, state and municipal laws, regulations, and ordinances for the protection of surrounding property, the public, workmen, and Owner's employees during all demolition and removal operations. Measures are to be taken, but not limited to installation of sidewalks, sheds, barricades, fences, warning lights and signs, trash chutes and temporary lighting.
- B. Protect all walks, roads, streets, curbs, pavements, trees and plantings, on and off premises, and bear all costs for correcting such damage as directed by the Architect, and to the satisfaction of the Owner.
- C. Demolition shall be performed in such a manner that will insure the safety of adjacent property. Protect adjacent property from damage and protect persons occupying adjacent property from injuries which might occur from falling debris or other cause and so as not to cause interference with the use of other portions of the building, of adjacent buildings or the free access and safe passage to and from the same.
- Every precaution shall be taken to protect against movement or settlement of the building, of adjacent buildings, sidewalks, roads, streets, curbs and pavements.
 Provide and place at the Contractor's own expense, all necessary bracing and shoring in connection with demolition and removal work.
- E. Remove portions of structures with care by using tools and methods that will not transfer heavy shocks to existing and adjacent building structures, both internal and external of the particular work area.
- F. Provide and maintain in proper condition, suitable fire resistive dust barriers around areas where interior demolition and removal work is in progress. Dust barriers shall prevent the dust migration to adjacent areas. Remove dust barriers upon completion of major demolition and removal in the particular work area.

3.6 DISCOVERY OF HAZARDOUS MATERIALS

A. If hazardous materials, such as chemicals, asbestos-containing materials, or other hazardous materials are discovered during the course of the work, cease work in affected area only and immediately notify the Architect and the Owner of such discovery. Do not proceed with work in such areas until instructions are issued by the Architect. Continue work in other areas.

B. If unmarked containers are discovered during the course of the work, cease work in the affected area only and immediately notify the Architect and the Owner of such discovery. Do not proceed with work in such areas until instructions are issued by the Architect. Take immediate precautions to prohibit endangering the containers integrity. Continue work in other areas.

3.7 CUTTING

- A. Perform all cutting of existing surfaces in a manner which will ensure a minimal difference between the cut area and new materials when patched. Use extreme care when cutting existing surfaces containing concealed utility lines which are indicated to remain and bear full responsibility for repairing or replacement of all such utilities that are accidentally damaged.
- B. Provide a flush saw cut edge where pavement, curb and concrete removals abut new construction work or existing surfaces to remain undisturbed.
- C. All slurry and water shall be contained and managed to avoid damage to existing conditions when using a wet saw or wet core driller.
- D. Obtain and pay for a hot work permit and arrange to have on-site a Fire Watch when using a cutting torch or similar item.

3.8 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Comply with requirements of Section 017400 CONSTRUCTION WASTE MANAGEMENT and the following:
 - 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.
- B. Burning: Do not burn demolished materials.

3.9 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Premises shall be left in a clean condition and ready to accept alteration work and new construction.

END OF SECTION

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 Project site.

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.

1.5 CLOSEOUT SUBMITTALS

A. Inventory of items that have been removed and salvaged.

1.6 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.
- C. Notify Architect/Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Storage or sale of removed items or materials on-site is not permitted.
- E. 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.
- F. Arrange selective demolition schedule so as not to interfere with Owner's operations.

1.7 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 ASSE 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. Engage a professional engineer to 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 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. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 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.
 - 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.

3.3 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.

3.4 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:
 - 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 a half 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.
- B. Site Access and Temporary Controls: Conduct selective demolition and debrisremoval 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 cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 CLEANING

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
 - 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. Coordinate first subparagraph below with use of elevators, stairs, or building entries permitted by building manager.
 - 4. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- 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 031000 - CONCRETE FORMING AND ACCESSORIES

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Form-facing material for cast-in-place concrete.
 - 2. Shoring, bracing, and anchoring.

1.2 PREINSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each of the following:
 - 1. Exposed surface form-facing material.
 - 2. Concealed surface form-facing material.
 - 3. Form ties.
 - 4. Waterstops.
 - 5. Form-release agent.
- B. Shop Drawings: Prepared by, and signed and sealed by, a qualified professional engineer responsible for their preparation, detailing fabrication, assembly, and support of forms.
 - 1. For exposed vertical concrete walls, indicate dimensions and form tie locations.
 - 2. Indicate dimension and locations of construction and movement joints required to construct the structure in accordance with ACI 301.
 - a. Location of construction joints is subject to approval of the Engineer.
 - 3. Indicate location of waterstops.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
- B. Minutes of pre-installation conference.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Concrete Formwork: Design, engineer, erect, shore, brace, and maintain formwork, shores, and reshores in accordance with ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads, so that resulting concrete conforms to the required shapes, lines, and dimensions.
 - 1. Design wood panel forms in accordance with APA's "Concrete Forming Design/Construction Guide."
 - 2. Design formwork to limit deflection of form-facing material to L/240 of center-to-center spacing of supports.

2.2 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. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - 1) APA HDO (high-density overlay).
 - 2) APA MDO (medium-density overlay); mill-release agent treated and edge sealed.
 - 3) APA Structural 1 Plyform, B-B or better; mill oiled and edge sealed.
 - 4) APA Plyform Class I, B-B or better; mill oiled and edge sealed.
- 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.

2.3 RELATED MATERIALS

- A. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.
- B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- C. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- D. 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.
- E. 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.

PART 3 EXECUTION

3.1 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-3.0: ACI 117 Class A, 1/8 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, reglets, 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 Engineer prior to forming openings not indicated on Drawings.
- L. Construction and Movement Joints:
 - 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 Engineer.
 - 3. Place joints perpendicular to main reinforcement.
 - 4. Locate joints for beams, slabs, joists, and girders in the middle third of spans.
 - a. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 - 6. Space vertical joints in walls as specified in Section 033000 "Cast-In-Place Concrete.".
 - a. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
- 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.

3.2 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. Retain applicable subparagraphs below, and insert others if required. Revise to suit Project.
 - 4. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 - 5. Install dovetail anchor slots in concrete structures, as indicated on Drawings.
 - 6. Clean embedded items immediately prior to concrete placement.

3.3 SHORING AND RESHORING INSTALLATION

- A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.
 - 1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.
- B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.
- C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
 - 1. Inspect formwork for shape, location, and dimensions of the concrete member being formed.
 - 2. Inspect insulating concrete forms for shape, location, and dimensions of the concrete member being formed.

END OF SECTION 031000

SECTION 032000 - CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Steel reinforcement bars.
 - 2. Welded-wire reinforcement.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Each type of steel reinforcement.
 - 2. Bar supports.
 - 3. Mechanical splice couplers.
- 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, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.
- C. Construction Joint Layout: Indicate proposed construction joints required to build the structure.
- D. Location of construction joints is subject to approval of the Architect/Engineer.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
 - 1. Reinforcement to Be Welded: Welding procedure specification in accordance with AWS D1.4/D1.4M
- B. Material Certificates: For each of the following, signed by manufacturers:
 - Epoxy-Coated Reinforcement: CRSI's "Epoxy Coating Plant Certification."
- C. Material Test Reports: For the following, from a qualified testing agency:
 - 1. Steel Reinforcement:
 - a. For reinforcement to be welded, mill test analysis for chemical composition and carbon equivalent of the steel in accordance with ASTM A706/A706M.
 - 2. Mechanical splice couplers.
- D. Field quality-control reports.
- E. Minutes of preinstallation conference.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.4/D 1.4M.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.
- B. Epoxy-Coated Reinforcing Bars:
 - 1. Steel Bars: ASTM A615/A615M, Grade 60, deformed bars.
 - 2. Epoxy Coating: ASTM A775/A775M or ASTM A934/A934M with less than 2 percent damaged coating in each 12-inch bar length.
- C. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.
- D. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.
- E. Galvanized-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from galvanized-steel wire into flat sheets.
- F. Epoxy-Coated Welded-Wire Reinforcement: ASTM A884/A884M, Class A coated, Type 1, deformed steel.

2.2 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:
 - a. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.
 - b. For epoxy-coated reinforcement, use CRSI Class 1A epoxy-coated or other dielectric-polymer-coated wire bar supports.
 - c. For dual-coated reinforcement, use CRSI Class 1A epoxy-coated or other dielectric-polymer-coated wire bar supports.
 - d. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.
 - e. For stainless steel reinforcement, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.
- B. Mechanical Splice Couplers: ACI 318 Type 1, same material of reinforcing bar being spliced;.
- C. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch in diameter.

2.3 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protection of In-Place Conditions:
 - 1. Do not cut or puncture vapor retarder.
 - 2. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.2 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 shall 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. Mechanical Splice Couplers: Install in accordance with manufacturer's instructions.
- G. Install welded-wire reinforcement in longest practicable lengths.
 - Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."
 - a. For reinforcement less than W4.0 or D4.0, continuous support spacing shall not exceed 12 inches.
 - 2. Lap edges and ends of adjoining sheets at least one wire spacing plus 2 inches for plain wire and 8 inches for deformed wire.
 - 3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
 - 4. Lace overlaps with wire.

3.1 JOINTS

- A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect/Engineer.
 - 1. Place joints perpendicular to main reinforcement.
 - 2. Continue reinforcement across construction joints unless otherwise indicated.
 - 3. Do not continue reinforcement through sides of strip placements of floors and slabs.

3.2 INSTALLATION TOLERANCES

A. Comply with ACI 117.

3.3 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:

- 1. Steel-reinforcement placement.
- 2. Steel-reinforcement mechanical splice couplers.
- 3. Steel-reinforcement welding.

END OF SECTION 032000

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 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, form liners, insulating concrete forms, and waterstops.
 - 2. Section 032000 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
 - 3. Section 312334 "Structural Excavation, Backfill and Compaction" for preparation of subgrade.

1.2 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, and other pozzolans materials subject to compliance with requirements.
- B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each of the following, where applicable.
 - 1. Portland cement.
 - 2. Fly ash.
 - 3. Slag cement.
 - 4. Blended hydraulic cement.
 - 5. Aggregates.
 - 6. Admixtures:
 - a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, and temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
 - 7. Vapor retarders.
 - 8. Liquid floor treatments.
 - 9. Curing materials.
 - 10. Joint fillers.
- B. Design Mixtures: For each concrete mixture, include the following:
 - 1. Mixture identification.
 - 2. Minimum 28-day compressive strength.
 - 3. Durability exposure class.
 - 4. Maximum w/cm.
 - 5. Calculated equilibrium unit weight, for lightweight concrete.
 - 6. Slump limit.
 - 7. Air content.

- 8. Nominal maximum aggregate size.
- 9. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
- 10. Intended placement method.
- C. Cold Weather Submittals
 - 1. In addition to the requirements of 1.4.B contractor shall submit alternate design mixtures for use during cold weather periods.
 - 2. Concrete Temperature Log: Contractor shall record and maintain a log of the concrete temperature for the duration of the cold weather protection period.
 - a. Temperature readings should be recorded on an hourly basis during work hours and every 3 hours during non-work hours.
 - b. This log should be kept on the job site and be accessible to inspection personnel at all times during work hours.
 - c. The temperature log shall be submitted to the engineer for inclusion in project records upon completion of the monitoring period.
- D. Shop Drawings:
 - 1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - a. Location of construction joints is subject to approval of the Architect/Engineer.
- E. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:
 - 1. Concrete Class designation.
 - 2. Location within Project.
 - 3. Exposure Class designation.
 - 4. Formed Surface Finish designation and final finish.
 - 5. Final finish for floors.
 - 6. Curing process.
 - 7. Floor treatment if any.

1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Curing compounds.
 - 4. Vapor retarders.
 - 5. Joint-filler strips.
- B. Material Test Reports: For the following, from a qualified testing agency:
 - 1. Portland cement.
 - 2. Fly ash.
 - 3. Slag cement.
 - 4. Blended hydraulic cement.
 - 5. Aggregates.
 - 6. Admixtures:
- C. Research Reports: For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
- D. Preconstruction Test Reports: For each mix design.
- E. Field quality-control reports.

1.6 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. Mockups: Full-size physical assemblies that are constructed on-site either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and 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.
 - 1. Laboratory Mockups: Full-size physical assemblies constructed and tested at testing facility to verify performance characteristics.
 - Integrated Exterior Mockups: Mockups of the exterior envelope constructed on-site as freestanding temporary built elements or as indicated in-place portions of permanent construction if approved by Architect, consisting of multiple products, assemblies, and subassemblies, with cutaways enabling inspection of concealed portions of the Work.
 - a. Include each system, assembly, component, and part of the exterior wall and roof to be constructed for the Project. Colors of components shall be those selected by the Architect for use in the Project.
 - 3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes; doors; windows; millwork; casework; specialties; furnishings and equipment; and lighting.
 - 4. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.
 - 5. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.
- C. Mockups for SF-2.0 are not required unless opted otherwise. Mockups for SF-3.0 are required.

1.7 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.
- B. Pre-Installation Conference for Concrete Construction: Pre-installation conference shall be required for any pour in excess of 100 cu. yds.
 - 1. Contractor shall be responsible for planning and coordination of meeting agenda and notification of participants. Meeting shall be scheduled a minimum of 5 days in advance of the planned concrete pour.
 - 2. Personnel to Attend: Contractor's project manager, owner's representative, concrete subcontractor, architect, engineer, testing lab supervisor, pumping

- contractor, concrete producer's quality control director, inspection and construction manager, if applicable, and anyone else with the need to know.
- 3. Suggested Agenda Items shall include but are not limited to: Project Information and Participants, Construction Sequence and Process, Base/Subbase preparation and acceptance, Site Access, Formwork and Removal, Placing Concrete equipment and procedures, Consolidation, Finishing, Jointing, Curing and Sealing, Protection of Concrete, Hot and Cold Weather precautions, QA/QC, Inspection and Testing, Special Inspections, etc.
- 1.8 DELIVERY, STORAGE, AND HANDLING
 - A. Comply with ASTM C94/C94M and ACI 301.
- 1.9 FIELD CONDITIONS
 - A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1.
 - B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1.

PART 2 - PRODUCTS

- 2.1 CONCRETE, GENERAL
 - A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.
- 2.2 CONCRETE MATERIALS
 - A. Cementitious Materials:
 - 1. Portland Cement: ASTM C150/C150M, Type I/II, gray.
 - 2. Fly Ash: ASTM C618, Class C or F.
 - 3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
 - B. Normal-Weight Aggregates: ASTM C33/C33M, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size:

Sieve Size	% Passing by Weight	
21/2"	-	
2"	-	
11/2"	100	
1"	93-100	
1/2"	27- 58	
1/4"	0-8	

2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

Sieve Size	% Passing by Weight	
3/8"	100	
No. 4	90-100	
8	75-100	
16	50-85	
30	25-60	

50	10-30
100	1-10
200	0-3

- C. Lightweight Aggregate: ASTM C330/C330M, 3/4-inch nominal maximum aggregate size.
- 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

2.3 VAPOR RETARDERS

A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A; not less than 10 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.

2.4 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.
 - 1. <u>Manufacturers:</u> 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. BASF Corporation.
 - b. Euclid Chemical Company (The); an RPM company.

2.5 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- B. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.
 - 1. Color:
 - a. Ambient Temperature Below 50 deg F: Black.
 - b. Ambient Temperature between 50 deg F and 85 deg F: Any color.
 - c. Ambient Temperature Above 85 deg F: White.
- C. Curing Paper: Eight-feet-wide paper, consisting of two layers of fibered kraft paper laminated with double coating of asphalt.
 - 1. <u>Manufacturers:</u> 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. Fortifiber Building Systems Group.
- D. Water: Potable or complying with ASTM C1602/C1602M.

- E. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.
- F. Clear, Waterborne, Membrane-Forming, Nondissipating Curing Compound: ASTM C309, Type 1, Class B, certified by curing compound manufacturer to not interfere with bonding of floor covering.
- G. Clear, Waterborne, Membrane-Forming, Curing and Sealing Compound: ASTM C1315, Type 1, Class A.

2.6 RELATED MATERIALS

- A. Expansion and Isolation Joint Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber or ASTM D1752, cork or self-expanding cork.
- B. Floor Slab Protective Covering: Eight-feet-wide cellulose fabric.
 - 1. <u>Manufacturers:</u> 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. McTech Group, Inc.

2.7 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. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 - Fly Ash or Other Pozzolans: 25 percent by mass.
 - 2. Slag Cement: 50 percent by mass.
 - 3. Total of Fly Ash or Other Pozzolans, Slag Cement: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass.
 - 4. Total of Fly Ash or Other Pozzolans: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass.
- C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
 - 1. Use 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.

2.8 CONCRETE MIXTURES

- A. Class A: Normal-weight concrete used for footings, frost walls, grade beams, and tie beams
 - 1. Exposure Class: ACI 318 F1.
 - 2. Minimum Compressive Strength: 4000 psi at 28 days.
 - 3. Maximum w/cm: 0.45.
 - 4. Slump Limit: 3 inches, plus or minus 1 inch.
 - 5. Air Content: 5.0 percent, plus or minus 1.5 percent at point of delivery.
 - 6. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.
- B. Class B: Normal-weight concrete used for above grade walls and exposed foundation walls.
 - 1. Exposure Class: ACI 318 F1.

- 2. Minimum Compressive Strength: 4000 psi at 28 days.
- 3. Maximum w/cm: 0.45.
- 4. Slump Limit: 3 inches, plus or minus 1 inch.
- 5. Air Content: 5.0 percent, plus or minus 1.5 percent at point of delivery
- 6. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.
- C. Class C: Normal-weight concrete used for interior slabs-on-ground.
 - 1. Minimum Compressive Strength: 4000 psi at 28 days.
 - 2. Maximum w/cm: 0.48.
 - 3. Minimum Cementitious Materials Content: 540lb/cu. yd...
 - 4. Slump Limit: 4 inches, plus or minus 1 inch, or 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.
 - 5. Air Content:
 - a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.
 - 6. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.
- D. Class D: Normal-weight concrete used for exterior slabs.
 - 1. Minimum Compressive Strength: 4000 psi at 28 days.
 - 2. Maximum w/cm: 0.45.
 - 3. Minimum Cementitious Materials Content: 540lb/cu. yd..
 - 4. Slump Limit: 4 inches, plus or minus 1 inch, or 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.
 - 5. Air Content: 6.0 percent, plus or minus 1.5 percent at point of delivery.
 - a. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.
- E. Class E: Normal-weight concrete used for interior suspended slabs.
 - 1. Minimum Compressive Strength: 4000 psi at 28 days.
 - 2. Maximum w/cm: 0.48.
 - 3. Minimum Cementitious Materials Content: 610 lb/cu. yd.
 - 4. Slump Limit: 4 inches, plus or minus 1 inch, or 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.
 - 5. Air Content:
 - a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.
 - 6. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.
- F. Class F: Structural lightweight concrete used for interior suspended slabs.
 - 1. Minimum Compressive Strength: 4000 psi at 28 days or as indicated.
 - 2. Calculated Equilibrium Unit Weight: 115 lb/cu. ft., plus or minus 3 lb/cu. ft. as determined by ASTM C567/C567M.
 - 3. Slump Limit: 4 inches, plus or minus 1 inch.
 - 4. Air Content:
 - a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.
 - 5. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.

- G. Class G: Normal-weight concrete used for concrete toppings and overlays.
 - 1. Minimum Compressive Strength: 5000 psi at 28 days.
 - 2. Minimum Cementitious Materials Content: 600 lb/cu. yd...
 - 3. Maximum w/cm: 0.45
 - 4. Slump Limit: 3 inches, plus or minus 1 inch, or 6 inches, plus or minus 1 inch for concrete with verified slump of 2 inches plus or minus 1 inch before adding high-range water-reducing admixture or plasticizing admixture.
 - 5. Air Content:
 - a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished toppings.
 - 6. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.
- H. Class H: Normal-weight concrete used for exterior site improvements (aprons, landing, equipment pads, tank pads generator pads, etc.).
 - 1. Minimum Compressive Strength: 3500 psi at 28 days.
 - 2. Maximum w/cm: 0.55.
 - 3. Minimum Cementitious Materials Content: 564 lb/cu. yd...
 - 4. Slump Limit: 4 inches, plus or minus 1 inch.
 - 5. Air Content: 6.0 percent, plus or minus 1.5 percent at point of delivery.
- I. Class I: Normal-weight concrete used for exterior retaining walls.
 - 1. Exposure Class: ACI 318 F2.
 - 2. Minimum Compressive Strength: 4000 psi at 28 days.
 - 3. Maximum w/cm: 0.45.
 - 4. Slump Limit: 3 inches, plus or minus 1 inch.
 - 5. Air Content: 6.0 percent, plus or minus 1.5 percent at point of delivery.

2.9 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

3.1 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. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.2 INSTALLATION OF VAPOR RETARDER

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.
 - 1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
 - 2. Face laps away from exposed direction of concrete pour.

- 3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
- 4. Lap joints 6 inches and seal with manufacturer's recommended tape.
- 5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
- 6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
- 7. Protect vapor retarder during placement of reinforcement and concrete.
 - a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.

3.3 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/Engineer.
 - 2. Place joints perpendicular to main reinforcement.
 - 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 joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 - 6. Space vertical joints in walls not more than thirty (30') feet apart in straight runs, unless otherwise indicated on Drawings. Locate vertical joints beside piers integral with walls, near corners, and in concealed locations where possible.
- C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:
 - 1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 - 2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.
- D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

- 1. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants are indicated.
- 2. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints:

- Install dowel bars and support assemblies at joints where indicated on Drawings.
- 2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.

3.4 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.
 - 1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
 - 2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Notify Architect/Engineer and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect/Engineer in writing, but not to exceed the amount indicated on the concrete delivery ticket.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. 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. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- E. 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.

- F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Do not place concrete floors and slabs in a checkerboard sequence.
 - 2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 3. Maintain reinforcement in position on chairs during concrete placement.
 - 4. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 5. Level concrete, cut high areas, and fill low areas.
 - 6. Slope surfaces uniformly to drains where required.
 - 7. Begin initial floating using bull floats or darbies to form a uniform and opentextured surface plane, before excess bleedwater appears on the surface.
 - 8. Do not further disturb slab surfaces before starting finishing operations.

3.5 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 301Surface 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.
 - 3. ACI 301 Surface Finish SF-3.0:
 - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
 - b. Remove projections larger than 1/8 inch.
 - c. Patch tie holes.
 - d. Surface Tolerance: ACI 117 Class A.
 - e. Locations: Apply to concrete surfaces to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.
- B. Rubbed Finishes: Remove forms as early as permitted by Article 3.9 Removal of Forms and perform necessary repairs and patches.
 - 1. Smooth Rubbed Finish If specified, produced smooth-rubbed finish no later than the day following form-work removal. Wet the surface and rub it with an abrasive such as carborundum brick until uniform color and texture are produced. If insufficient cement paste can be drawn from the concrete itself by the rubbing process, use a grout made with cementitious materials from the same sources as used for in-place concrete.
 - 2. Grout-Cleaned Rubbed Finish If grout-cleaned rubbed finish is specified, begin cleaning operations after contiguous surfaces are completed and accessible. Do not clean surfaces as Work progresses. Wet the surface

- and, unless otherwise specified, apply grout consisting of 1 part by volume portland cement and 1-1/2 parts of sand meeting the requirements of ASTM C144 or ASTM C404, with sufficient water to produce a consistency of thick paint. Scrub grout into voids and remove excess grout.
- 3. Cork-Floated Finish if cork-floated finish is specified, remove ties, burrs, and fins. Wet the surface and, unless otherwise specified, apply stiff grout of 1 part portland cement and 1 part sand meeting the requirements of ASTM C144 or ASTM C404 to fill voids. Use sufficient water to produce a stiff consistency. Compress grout into voids. Produce the final finish with cork float, using a swirling motion.
- C. Final Concrete Finish: Concrete
- D. 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.

3.6 FINISHING FLOORS AND SLABS

- A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish:
 - 1. While still plastic, texture concrete surface that has been screeded and bull-floated or darbied.
 - 2. Use stiff brushes, brooms, or rakes to produce a profile depth of 1/4 inch in one direction.
 - 3. Apply scratch finish to surfaces to receive concrete floor toppings or to receive mortar setting beds for bonded cementitious floor finishes.

C. Float Finish:

- 1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
- 2. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
- 3. Apply float finish to surfaces to receive trowel finish, to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

D. Trowel Finish:

- 1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
- 2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
- 3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
- 4. Do not add water to concrete surface.
- 5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.

- 6. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
- 7. Finish and measure surface, so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch.
- E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.
 - 1. Coordinate required final finish with Architect/Engineer before application.
 - 2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, pads, and locations indicated on Drawings.
 - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
 - 2. Coordinate required final finish with Architect/Engineer before application.
- G. Slip-Resistive Finish: Before final floating, apply slip-resistive aggregate or aluminum granule finish to concrete stair treads, platforms, ramps as indicated on Drawings
 - 1. Apply in accordance with manufacturer's written instructions and as follows:
 - a. Uniformly spread 25 lb/100 sq. ft. of dampened slip-resistive aggregate or aluminum granules over surface in one or two applications.
 - b. Tamp aggregate flush with surface, but do not force below surface.
 - c. After broadcasting and tamping, apply float finish.
 - d. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive aggregate or aluminum granules.

3.7 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.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations:
 - 1. Coordinate sizes and locations of concrete bases with actual equipment provided.
 - 2. Construct concrete bases 4 inches high unless otherwise indicated on Drawings, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.
 - 3. Minimum Compressive Strength: 4000 psi at 28 days.

- 4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
- 5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
- 6. Prior to pouring concrete, place and secure anchorage devices.
 - a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - b. Cast anchor-bolt insert into bases.
 - c. Install anchor bolts to elevations required for proper attachment to supported equipment.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items.
 - 1. Cast-in inserts and accessories, as shown on Drawings.
 - 2. Screed, tamp, and trowel finish concrete surfaces.

3.8 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.
 - a. Concrete curing protection period when cold weather concreting is in effect shall be a minimum of 3 days.
 - 2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
 - 3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h before and during finishing operations.
- B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:
 - 1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
 - 2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
 - 3. If forms remain during curing period, moist cure after loosening forms.
 - 4. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:
 - a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
 - b. Continuous Sprinkling: Maintain concrete surface continuously wet.
 - c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
 - d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
 - e. 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. Interior Concrete Floors:
 - a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:
 - Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - a) Lap edges and ends of absorptive cover not less than 12-inches.
 - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
 - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
 - a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - b) Cure for not less than seven days.
 - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
 - a) Water.
 - b) Continuous water-fog spray.
 - b. Floors to Receive Penetrating Liquid Floor Treatments: Contractor has option of the following:
 - Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - a) Lap edges and ends of absorptive cover not less than 12 inches.
 - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
 - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
 - a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - b) Cure for not less than seven days.
 - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
 - a) Water.
 - b) Continuous water-fog spray.
 - c. Floors to Receive Polished Finish: Contractor has option of the following:
 - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.

- a) Lap edges and ends of absorptive cover not less than 12 inches.
- b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
- 2) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
 - a) Water.
 - b) Continuous water-fog spray.
- d. Floors to Receive Chemical Stain:
 - As soon as concrete has sufficient set to permit application without marring concrete surface, install curing paper over entire area of floor.
 - 2) Install curing paper square to building lines, without wrinkles, and in a single length without end joints.
 - 3) Butt sides of curing paper tight; do not overlap sides of curing paper.
 - 4) Leave curing paper in place for duration of curing period, but not less than 28 days.
- e. Floors to Receive Urethane Flooring:
 - As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - 2) Rewet absorptive cover, and cover immediately with polyethylene moisture-retaining cover with edges lapped 6 inches and sealed in place.
 - 3) Secure polyethylene moisture-retaining cover in place to prohibit air from circulating under polyethylene moisture-retaining cover.
 - 4) Leave absorptive cover and polyethylene moisture-retaining cover in place for duration of curing period, but not less than 28 days.
- f. Floors to Receive Curing Compound:
 - 1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
 - 3) Maintain continuity of coating, and repair damage during curing period.
 - 4) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.
- g. Floors to Receive Curing and Sealing Compound:
 - 1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.

3) Repeat process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

3.9 REMOVAL OF FORMS

- A. The forms shall be removed in such a manner as to insure the complete safety of the structure or improvements.
- B. Forms shall not be disturbed until the concrete has sufficiently hardened, and acquired sufficient strength to support its own weight and the load upon it.
- C. Form removal shall comply with the following schedule:

Structural Element	Atmospheric Temperature		
	Above 60°F	Between 60°F and 40°F	
Walls, column and beam sides	3 Days	4 Days	
Suspended Slab Bottoms	5 Days	6 Days	
Beam and Girder Bottoms	7 Days	10 Days	

- D. No backfilling or imposing of other forces or loads shall be permitted before the concrete has attained its design strength.
- E. After the removal of forms where concrete is exposed to view, the entire surface shall be rubbed to provide a homogeneous surface and defective surfaces shall be repaired and patches to meet the minimum surface finish class specified in section 3.5.
- F. Metal ties shall be cut back at least three-quarters (¾") inch and spaces filled. Patches shall be properly cured, color matched, and otherwise treated so as to obtain as near a permanent homogeneous surface as practicable.

3.10 TOLERANCES

A. Conform to ACI 117.

3.11 APPLICATION OF LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment in accordance with manufacturer's written instructions.
 - 1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
 - 2. Do not apply to concrete that is less than seven days' old.
 - 3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing.
 - 4. Rinse with water; remove excess material until surface is dry.
 - 5. Apply a second coat in a similar manner if surface is rough or porous.
- B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

3.12 FIELD QUALITY CONTROL

A. Special Inspections:

- 1. Where Special Inspections are required and listed on the plans, the owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.
- 2. Where Special Inspections are not required, the contractor shall engage a qualified testing and inspecting agency, at contractor's expense, to perform tests and inspections and to submit reports as outlined in section 3.12.B

B. Testing Agency:

- 1. Testing agency shall be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with ASTM C31/C31M.
- 2. Testing agency shall immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
- 3. Testing agency shall report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
 - a. Test reports shall 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: Required inspections to be performed by qualified testing agency. Project specific special inspections required are listed on the contract plans.
 - 1. Headed bolts and studs.
 - 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.

- E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C172/C172M shall 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.
 - 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. Slump Flow: ASTM C1611/C1611M:
 - 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.
 - 4. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete; ASTM C173/C173M volumetric method, for structural lightweight concrete.
 - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - 5. Concrete Temperature: ASTM C1064/C1064M:
 - a. One test hourly when air temperature is above 40 deg F and below or 80 deg F and above, and one test for each composite sample.
 - 6. Unit Weight: ASTM C567/C567M fresh unit weight of structural lightweight concrete.
 - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - 7. Compression Test Specimens: ASTM C31/C31M:
 - a. Cast, initial cure in field for 3 days, then laboratory cure one sets of four (4) 6-inch by 12-inch cylinder specimens for each composite sample.
 - Where maximum coarse aggregate size does not exceed 1¼ inches, five (5) 4-inch by 8-inch cylinder specimens for each composite sample may be cast in-lieu of 6-inch by 12-inch specimens.
 - 8. Compressive-Strength Tests: ASTM C39/C39M.
 - a. For each set, test one (1) specimen at seven days, two (2) specimens at 28 days, and hold one (1) specimen in reserve for later testing if required.
 - 1) Where 4-inch by 8-inch cylinders are cast, test three (3) specimens at 28 days.
 - 9. 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.
 - 10. Test results shall be reported in writing to Architect/Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspection agency, location of concrete batch in work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for each test performed.

11. Additional Tests:

- a. Testing and inspecting agency shall 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/Engineer.
- 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/Engineer.
 - 1) Acceptance criteria for concrete strength shall be in accordance with ACI 301 section 1.6.6.3.
- 12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- 13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 24 hours of completion of floor finishing and promptly report test results to Architect/Engineer.

3.13 PROTECTION

- A. Protect concrete surfaces as follows:
 - 1. Protect from petroleum stains.
 - 2. Diaper hydraulic equipment used over concrete surfaces.
 - 3. Prohibit vehicles from interior concrete slabs.
 - 4. Prohibit use of pipe-cutting machinery over concrete surfaces.
 - 5. Prohibit placement of steel items on concrete surfaces.
 - 6. Prohibit use of acids or acidic detergents over concrete surfaces.
 - 7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.
 - 8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using Floor Slab Protective Covering.

END OF SECTION 033000

SECTION 033110 - CONTROLLED DENSITY FILL

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 specifies ready-mix Controlled Density Fill (CDF) for the following applications:
 - 1. General backfill applications for trenches and foundations.
- B. Related Sections include the following:
 - 1. Other Division 03 Sections for Concrete related work.
 - 2. Division 31 Sections for Earthwork requirements
- C. Definitions:
 - Ready-mix Controlled Density Fill (CDF) is used as an alternative to compacted soil and is also known as Controlled Low Strength Material (CLSM), or flowable fill.

1.3 SUBMITTALS:

- A. Submit manufacturer's Stable-Air Generator Admixture product data, installation instructions, and recommendations for material use.
- B. Test and Performance Data:
 - Controlled Density Fill shall have a compressive strength of 100-300 psi according to ASTM C39 at 28 days after placement. Submit complete mix design.
 - 2. Controlled Density Fill shall have a minimal subsidence and bleed water which is measured as a Final Bleeding of less than 2.0% (retains 98.0% of original height after placement, approximately ¼" per foot of depth) as measured in Section 10 of ASTM C940 "Standard Test Method for Expansion and Bleeding of Freshly Mixed Grouts for Pre-placed Aggregate Concrete in the Laboratory".
 - 3. Controlled Density Fill shall have a unit weight of 115 to 145 pcf.

PART 2 - MATERIALS

2.1 PRODUCTS:

- A. Air Entraining Admixture:
 - 1. Grace Construction Products, "DARAFILL".
 - 2. Masterbuilders Technologies, "RHEOCELL RHEOFILL".
 - Approved Equal.
- B. Portland Cement: Conforming to ASTM C150.
- C. Aggregate: Conforming to ASTM C33.
- D. Fly Ash: Conforming to ASTM C618, Class C or F.

E. Water: Clean, potable.

2.2 MIXTURE:

- A. Mix design shall produce a consistency that will result in a flowable product that is self-leveling and does not require manual means to move it into place at the time of placement. Minimum diameter spread for CFD shall be 8 in.
- B. Provide mix with a fresh unit weight between 90 125 pcf and a compressive strength of 80 psi when measured 28 days after placement. One-year unconfined compressive strength shall not exceed 150 psi.
- C. Controlled Density Fill shall have an in-place yield of 98% of the design yield.
- D. Entrained air content: 15 20%.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine conditions of substrates or other conditions under which the work is to be performed and notify the Engineer of circumstances detrimental to proper placement of the material.

3.2 PLACEMENT:

A. Secure piping, conduits, and other items to be encased to prevent movement during placement of the Controlled Density Fill.

3.3 PROTECTION:

A. Protect Controlled Density Fill from traffic or overlay materials until sufficient strength has been achieved for further construction operations.

END OF SECTION 033113

SECTION 033300 - ARCHITECTURAL CONCRETE

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Cast-in-place architectural concrete including form facings, reinforcement accessories, concrete materials, concrete mixture design, placement procedures, and finishes.
 - 2. The requirements of this Section complement Section 033000, CAST-IN-PLACE CONCRETE; and apply to architectural concrete as specified and as indicated on Drawings.
- B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
 - 1. Section 033000 CAST-IN-PLACE CONCRETE for formwork; material, fabrication, and installation requirements for steel reinforcement; and field quality control.
 - 2. Section 079200 JOINT SEALANTS for elastomeric joint sealants in contraction and other joints in cast-in-place architectural concrete.

1.3 DEFINITIONS

- A. Cast-in-Place Architectural Concrete: Formed concrete that is exposed to view on surfaces of completed structure or building and that requires special concrete materials, formwork, placement, or finishes to obtain specified architectural appearance.
- B. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.
- C. Design Reference Sample: Sample designated by Architect in the Contract Documents that reflects acceptable surface quality and appearance of cast-in-place architectural concrete.
- D. Reveal: Projection of coarse aggregate from matrix or mortar after completion of exposure operations.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Description of Methods and Sequence of Placement. For each type of specially-finished concrete provide description of methods and sequence of placement.
- C. Certificates: Prior to installation submit copies of a signed affidavit from the manufacturer of the coloring product stating that coloring product to be used in concrete is compatible with the concrete mix and type to which it will be combined, and that no adverse affects will occur to the workability, setting, or strength of concrete.
- D. Manufacturer's Review: Submit written signed statement, that Contract Documents have been reviewed by qualified representatives of the materials manufacturer, and that materials and system to be used for floor finish are proper and adequate for the applications shown.
- E. Manufacturer's Data: Submit manufacturer's specifications and installation instructions for all products in concrete floor finish, including certifications and other data as may be required to show compliance with the Contract Documents.
- F. Substrate Acceptability: Submit a certified statement issued by the manufacturer of concrete floor finish materials and countersigned by installer, attesting that surfaces designated to receive concrete floor finish are satisfactory warranty requirements. Application of materials will be construed as acceptance of surfaces.
- G. Statement of Supervision: Submit signed statement signed that field supervision by manufacturer's representative was sufficient to ensure proper application of materials and that the installation is acceptable to manufacturer.
- H. Samples for Verification: Architectural concrete samples, cast vertically, approximately 18 by 18 by 2 inches, of finishes, colors, and textures to match design reference sample. Include Sample sets showing the full range of variations expected in these characteristics.

1.5 QUALITY ASSURANCE

- A. Finish Objective Samples. If samples are placed on display in the office of the Architect, to describe finish objectives, such samples are hereby made part of these Specifications to the degree that the samples exhibit the required color, texture and surface finish requirements. Such samples, if provided, are provided for bidding purposes only; the actual mix components, forming, placing, and finishing procedures and requirements shall be as determined by acceptable preconstruction mock-ups.
- B. Preconstruction Conference. Attend a preconstruction conference prior to the start of architectural concrete construction as directed by the Architect. Discussion will include the following:
 - 1. The Contractor's program to obtain the specified quality of architectural concrete.

- 2. The procedures and methods for construction of preconstruction mock-ups specified herein.
- C. Preconstruction Mock-up Panels or Areas:
 - 1. General:
 - a. Schedule mock-up casting for acceptance 30 days prior to casting of architectural concrete surfaces represented by the mock-ups.
 - b. Locate mock-up panels in non-public areas acceptable to the Architect. Brace panels as required for safety.
 - c. Continue to cast mock-ups until acceptable mock-ups are produced. Accepted mock-ups shall be the standard for color, texture, and workmanship for the work.
 - d. Mock-up sequence of forming, placing, form removal, curing and finishing shall be reviewed and accepted by the Architect.
 - e. Mock-up formwork shall be inspected and accepted by the Architect before placing of concrete.
 - f. Use the same concrete mixes and placement procedures, accepted in mock-ups, in the final work, unless otherwise directed by the Architect.
 - g. Protect accepted mock-ups from damage until completion and acceptance of the work represented by the mock-up.
 - h. Remove mock-up panels from site at completion of Project, as directed by the Architect.
 - 2. Construct mock-up panels or areas as indicated to demonstrate the ability to cast architectural concrete to achieve shapes, color, and textured finishes required. Mock-ups shall include or meet the following requirements:
 - a. Provide full scale mock-up panels and areas.
 - b. Provide mock-ups simulating actual design and execution conditions for concrete mix materials, reinforcement, formwork, placing sequence, form removal, curing, finishing, and methods and materials of stain removal and correction of defective work.
 - c. On mock-ups where directed by the Architect, provide minimum of five variation of mix color to be used in the repair of defective work, in order to determine acceptable color and texture match.
 - d. Demonstrate, on the mock-ups, materials and methods of plugging tieholes unless tie holes are indicated to be left in place.
 - e. Demonstrate in the construction of the mock-up formwork the sealer material, form release agent, and curing materials and methods to be used.
- D. Source of Materials. Utilize the same source, stock or brand of concrete materials for each class or mix of architectural concrete. Do not interchange materials or mixes until an additional mock-up shows that uniformity in finish, texture, and color, as compared to original mock-up will be maintained. If necessary, obtain and stockpile materials in sufficient quantity to ensure continuity and uniformity.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's unopened containers identified with brand, type, grade, date of manufacture, class, lot number, and other qualifying information.
- B. Store materials in original sealed containers, in dry enclosed storage area, within temperature range recommended by manufacturer.

1.7 JOB CONDITIONS

- A. Maintain manufacturer's current installation instructions at Project site.
- B. Maintain interior building area above 50oF before, during, and after installation of architectural concrete until structure and subfloor temperatures are stabilized.
- C. Provide and maintain adequate ventilation until concrete cures completely.

1.8 PROTECTION

A. Protect adjacent surfaces and repair, restore, or replace soiled or damaged in performance of special architectural concrete finish work.

1.9 GUARANTEE

A. Warrant work of this Section for five years from date of Substantial Completion; correct defects upon written notice at no additional cost to Owner. Warranty shall be signed by installer and materials manufacturer.

PART 2 - PRODUCTS

2.1 CONCRETE

A. Except as otherwise indicated, concrete materials including aggregates, Portland cement, and water shall conform to Section 033000, CAST-IN-PLACE CONCRETE.

2.2 ARCHITECTURAL CONCRETE FOR VERTICAL WALLS

- A. Concrete: Color of concrete shall be normalweight concrete without color additive; color for architectural concrete shall be uniform throughout area designated.
- B. Formwork Ties: Formwork tie spacing and location of ties shall be in a consistent pattern or layout acceptable to the Architect. Tie design shall be acceptable to the Architect.
- C. Formwork Materials: Steel faced or fiberglass faced formwork as required to produce a smooth form finish acceptable to the Architect.
 - 1. Architectural Concrete Finish No. 1 Smooth Form Finish with Smooth Rubbed Finish:

- a. Formwork: Smooth form concrete using steel forms or fiberglass forms. Joints in formwork shall be sealed. Form ties shall be uniformly placed accurately located in accordance with layout approved by the Architect.
- b. Finish Description/Procedure: Rubbing shall be produced on newly hardened concrete no later than the day following form removal. When required by the Architect to correct work done in an incorrect manner or in a manner not as specified, rubbing shall commence within 48 hours of notification by the Architect. Surfaces to be rubbed shall be wetted and rubbed with carborundum brick or other approved abrasive of equal quality until uniform color and texture are produced, without applying any cement, grout or other coating. Rubbing will not be permitted when the air temperature is expected to fall below 40 degrees F. Rubbing may be performed by use of approved power equipment and tools, providing that the operational procedures shall produce the same desired effects as hand rubbing.
- c. Cement Color: Color meeting approved mock-up. In order to achieve the desired color/finish of concrete, concrete mix may required the use of a white cement or control of color of aggregates may be required.

PART 3 - EXECUTION

3.1 PLACING CONCRETE

- A. Except as modified herein, concrete shall be placed in accordance with Section 033000, CAST-IN-PLACE CONCRETE.
 - Consolidate vertical colored concrete in lifts 1 ft. or less in depth and vibrate twice that normally required by decreasing the spacing, depth, and time to ensure uniform color.
 - 2. There shall be no honeycombing or segregated aggregates in concrete exposed to view in areas identified as Architectural Concrete.

3.2 PROTECTION FROM AND REMOVAL OF STAINS

- A. On mock-up where directed by the Architect, demonstrate methods of rust stain removal in accordance with recommendations of ACI 303 Chapter 10, Section 10.4.
- B. Comply with requirements of Section 033000, CAST-IN-PLACE CONCRETE, and procedures used in construction of accepted mock-ups.

END OF SECTION

SECTION 034500 - ARCHITECTURAL PRECAST CONCRETE

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Architectural precast concrete shapes as indicated to match existing
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 033000 CAST-IN-PLACE CONCRETE for installing connection anchors in concrete.
 - 2. Section 051200 STRUCTURAL STEEL FRAMING for furnishing and installing connections attached to structural-steel framing.
 - 3. Section 055000 METAL FABRICATIONS for miscellaneous steel shapes.

1.3 DEFINITION

A. Design Reference Sample: Sample of approved architectural precast concrete color, finish, and texture, preapproved by Architect.

1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide architectural precast concrete units and connections capable of withstanding the following design loads within limits and under conditions indicated.
 - 1. Wind Loads: As required by Code.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each precast concrete mixture. Include compressive strength and water-absorption tests.
- C. Shop Drawings: Detail fabrication and installation of architectural precast concrete units. Indicate locations, plans, elevations, dimensions, shapes, and cross sections of

each unit. Indicate joints, reveals, and extent and location of each surface finish. Indicate details at building corners.

- 1. Indicate separate face and backup mixture locations and thicknesses.
- 2. Indicate welded connections by AWS standard symbols. Detail loose and cast-in hardware and connections.
- 3. Indicate locations, tolerances, and details of anchorage devices to be embedded in or attached to structure or other construction.
- 4. Indicate locations, extent, and treatment of dry joints if two-stage casting is proposed.
- 5. Include plans and elevations showing unit location and sequence of erection for special conditions.
- 6. Indicate location of each architectural precast concrete unit by same identification mark placed on panel.
- 7. Indicate relationship of architectural precast concrete units to adjacent materials.
- 8. Design Modifications: If design modifications are proposed to meet performance requirements and field conditions, submit design calculations and Shop Drawings. Do not adversely affect the appearance, durability, or strength of units when modifying details or materials and maintain the general design concept.
- 9. Comprehensive engineering analysis signed and sealed by the qualified professional engineer responsible for its preparation. Show governing panel types, connections, and types of reinforcement, including special reinforcement. Indicate location, type, magnitude, and direction of loads imposed on the building structural frame from architectural precast concrete.
- D. Samples: For each type of finish indicated on exposed surfaces of architectural precast concrete units, in sets of 3, illustrating full range of finish, color, and texture variations expected; approximately 12 by 12 by 2 inches.
 - 1. When other faces of precast concrete unit are exposed, include Samples illustrating workmanship, color, and texture of backup concrete as well as facing concrete.
- E. Welding certificates.
- F. Qualification Data: For Installer and fabricator
- G. Material Test Reports: For aggregates.
- H. Material Certificates: Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards. Provide for each type and size of the following:
 - 1. Cementitious materials.
 - 2. Reinforcing materials and prestressing tendons.
 - 3. Admixtures.
 - 4. Bearing pads.
 - 5. Structural-steel shapes and hollow structural sections.

- I. Source quality-control test reports.
- J. Field quality-control test and special inspection reports.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm that assumes responsibility for engineering architectural precast concrete units to comply with performance requirements. This responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
 - 1. Participates in PCI's plant certification program and is designated a PCI-certified plant for Group A, Category A1 Architectural Cladding and Load Bearing Units.
- B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
- C. Design Standards: Comply with ACI 318 and design recommendations of PCI MNL 120, "PCI Design Handbook Precast and Prestressed Concrete," applicable to types of architectural precast concrete units indicated.
- D. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL 117, "Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products."
- E. Welding: Qualify procedures and personnel according to AWS D1.1/D.1.1M, "Structural Welding Code - Steel"; and AWS D1.4, "Structural Welding Code -Reinforcing Steel."
- F. Sample Panels: After sample approval and before fabricating architectural precast concrete units, produce a minimum of 2 sample panels approximately 3 sq. ft. in area for review by Architect. Incorporate full-scale details of architectural features, finishes, textures, and transitions in sample panels.
 - 1. Locate panels where indicated or, if not indicated, as directed by Architect.
 - 2. Damage part of an exposed-face surface for each finish, color, and texture, and demonstrate adequacy of repair techniques proposed for repair of surface blemishes.
 - 3. After acceptance of repair technique, maintain one sample panel at manufacturer's plant and one at Project site in an undisturbed condition as a standard for judging the completed Work.
 - 4. Demolish and remove sample panels when directed.
- G. Range Samples: After sample panel approval and before fabricating architectural precast concrete units, produce a minimum of 5 sets of samples, approximately 3 sq. ft. in area, representing anticipated range of each color and texture on Project's units.

- Following range sample, maintain one set of samples at Project site and remaining sample sets at manufacturer's plant as color and texture approval reference.
- H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01. Agenda shall include protection of air barrier membrane during construction.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver architectural precast concrete units in such quantities and at such times to limit unloading units temporarily on the ground.
- B. Support units during shipment on nonstaining shock-absorbing material.
- C. Store units with adequate dunnage and bracing and protect units to prevent contact with soil, to prevent staining, and to prevent cracking, distortion, warping or other physical damage.
- D. Place stored units so identification marks are clearly visible, and units can be inspected.
- E. Handle and transport units in a position consistent with their shape and design in order to avoid excessive stresses which would cause cracking or damage.
- F. Lift and support units only at designated points shown on Shop Drawings.

1.8 PROJECT CONDITIONS

A. Protection of Air Barrier Membrane: During construction, protect air barrier membrane from penetrations which allow air to pass through air barrier assemblies. Engage original installer to repair damage promptly using identical materials and methods of installation, and to the satisfaction of the Architect.

1.9 SEQUENCING

A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction without delaying the Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation.

PART 2 - PRODUCTS

2.1 MOLD MATERIALS

A. Molds: Rigid, dimensionally stable, non-absorptive material, warp and buckle free, that will provide continuous and true precast concrete surfaces within fabrication tolerances indicated; nonreactive with concrete and suitable for producing required finishes.

- Mold-Release Agent: Commercially produced liquid-release agent that will not bond with, stain or adversely affect precast concrete surfaces and will not impair subsequent surface or joint treatments of precast concrete.
- B. Form Liners: Units of face design, texture, arrangement, and configuration indicated. Furnish with manufacturer's recommended liquid-release agent that will not bond with, stain, or adversely affect precast concrete surfaces and will not impair subsequent surface or joint treatments of precast concrete.
- C. Surface Retarder: Chemical set retarder, capable of temporarily delaying final hardening of newly placed concrete mixture to depth of reveal specified.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Epoxy-Coated Reinforcing Bars: ASTM A 775/A 775M epoxy coated.
- C. Epoxy-Coated-Steel Wire: ASTM A 884/A 884M, Class A coated, deformed, flat sheet, Type 1 bendable coating.
- D. Supports: Suspend reinforcement from back of mold or use bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place according to PCI MNL 117.

2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I or Type III, gray, unless otherwise indicated.
 - 1. For surfaces exposed to view in finished structure, mix gray with white cement, of same type, brand, and mill source.
- B. Normal-Weight Aggregates: Except as modified by PCI MNL 117, ASTM C 33, with coarse aggregates complying with Class 5S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for Project.
 - 1. Face-Mixture-Coarse Aggregates: Selected, hard, and durable; free of material that reacts with cement or causes staining; to match selected finish sample.
 - a. Gradation: To match design reference sample.
 - 2. Face-Mixture-Fine Aggregates: Selected, natural or manufactured sand of same material as coarse aggregate, unless otherwise approved by Architect.
- C. Coloring Admixture: ASTM C 979, synthetic or natural mineral-oxide pigments or colored water-reducing admixtures, temperature stable, and nonfading.
- D. Water: Potable; free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 117.

E. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.

2.4 STAINLESS-STEEL CONNECTION MATERIALS

- A. Stainless-Steel Plate: ASTM A 666, Type 304, of grade suitable for application.
- B. Stainless-Steel Bolts and Studs: ASTM F 593, Alloy 304 or 316, hex-head bolts and studs; stainless-steel nuts; and flat, stainless-steel washers.
 - 1. Lubricate threaded parts of stainless-steel bolts with an antiseize thread lubricant during assembly.
- C. Stainless-Steel-Headed Studs: ASTM A 276, with minimum mechanical properties of PCI MNL 117, Table 3.2.3.

2.5 BEARING PADS

- A. Provide one of the following bearing pads for architectural precast concrete units as recommended by precast fabricator for application:
 - 1. Elastomeric Pads: AASHTO M 251, plain, vulcanized, 100 percent polychloroprene (neoprene) elastomer, molded to size or cut from a molded sheet, Type A durometer hardness of 50 to 70, ASTM D 2240, minimum tensile strength 2250 psi, ASTM D 412.
 - Random-Oriented, Fiber-Reinforced Elastomeric Pads: Preformed, randomly oriented synthetic fibers set in elastomer. Type A durometer hardness of 70 to 90, ASTM D 2240; capable of supporting a compressive stress of 3000 psi with no cracking, splitting, or delaminating in the internal portions of pad. Test one specimen for every 200 pads used in Project.
 - 3. Cotton-Duck-Fabric-Reinforced Elastomeric Pads: Preformed, horizontally layered cotton-duck fabric bonded to an elastomer; Type A durometer hardness of 80 to 100, ASTM D 2240; complying with AASHTO's "AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications, Division II, Section 18.10.2, or with MIL-C-882E.
 - 4. Frictionless Pads: Tetrafluoroethylene (Teflon), glass-fiber reinforced, bonded to stainless or mild-steel plate, of type required for in-service stress.
 - 5. High-Density Plastic: Multimonomer, nonleaching, plastic strip.

2.6 ACCESSORIES

- A. Reglets: Stainless steel, Type 302 or 304, felt or fiber filled, or with face opening of slots covered.
- B. Precast Accessories: Provide clips, hangers, plastic or steel shims, and other accessories required to install architectural precast concrete units.

2.7 GROUT MATERIALS

A. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, Grade A for drypack and Grades B and C for flowable grout and of consistency suitable for application within a 30-minute working time.

2.8 CONCRETE MIXTURES

- A. Prepare design mixtures for each type of precast concrete required.
- B. Design mixtures may be prepared by a qualified independent testing agency or by qualified precast plant personnel at architectural precast concrete fabricator's option.
- C. Limit water-soluble chloride ions to maximum percentage by weight of cement permitted by ACI 318 or PCI MNL 117 when tested according to ASTM C 1218/C 1218M.
- D. Normal-Weight Concrete Mixtures: Proportion face and backup mixtures by either laboratory trial batch or field test data methods according to ACI 211.1, with materials to be used on Project, to provide normal-weight concrete with the following properties:
 - 1. Compressive Strength (28 Days): 5000 psi minimum.
 - 2. Maximum Water-Cementitious Materials Ratio: 0.45.
- E. Water Absorption: 6 percent by weight or 14 percent by volume, tested according to PCI MNL 117.
- F. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content complying with PCI MNL 117.
- G. When included in design mixtures, add other admixtures to concrete mixtures according to manufacturer's written instructions.

2.9 MOLD FABRICATION

- A. Molds: Accurately construct molds, mortar tight, of sufficient strength to withstand pressures due to concrete-placement operations and temperature changes and for prestressing and detensioning operations. Coat contact surfaces of molds with release agent before reinforcement is placed. Avoid contamination of reinforcement and prestressing tendons by release agent.
 - 1. Place form liners accurately to provide finished surface texture indicated. Provide solid backing and supports to maintain stability of liners during concrete placement. Coat form liner with form-release agent.
- B. Maintain molds to provide completed architectural precast concrete units of shapes, lines, and dimensions indicated, within fabrication tolerances specified.

- 1. Form joints are not permitted on faces exposed to view in the finished work.
- 2. Edge and Corner Treatment: Uniformly chamfered.

2.10 FABRICATION

- A. Cast-in Anchors, Inserts, Plates, Angles, and Other Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where it does not affect position of main reinforcement or concrete placement.
 - Weld-headed studs and deformed bar anchors used for anchorage according to AWS D1.1/D1.1M and AWS C5.4, "Recommended Practices for Stud Welding."
- B. Furnish loose hardware items including steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and other hardware shapes for securing architectural precast concrete units to supporting and adjacent construction.
- C. Cast-in reglets, slots, holes, and other accessories in architectural precast concrete units as indicated on the Contract Drawings.
- D. Cast-in openings larger than 10 inches in any dimension. Do not drill or cut openings or prestressing strand without Architect's approval.
- E. Reinforcement: Comply with recommendations in PCI MNL 117 for fabricating, placing, and supporting reinforcement.
 - 1. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy the bond with concrete. When damage to epoxy-coated reinforcing exceeds limits specified in ASTM A 775/A 775M, repair with patching material compatible with coating material and epoxy coat bar ends after cutting.
 - 2. Accurately position, support, and secure reinforcement against displacement during concrete-placement and consolidation operations. Completely conceal support devices to prevent exposure on finished surfaces.
 - 3. Place reinforcement to maintain at least 3/4-inch minimum coverage. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position while placing concrete. Direct wire tie ends away from finished, exposed concrete surfaces.
 - 4. Place reinforcing steel and prestressing strand to maintain at least 3/4-inch minimum concrete cover. Increase cover requirements for reinforcing steel to 1-1/2 inches when units are exposed to corrosive environment or severe exposure conditions. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position while placing concrete. Direct wire tie ends away from finished, exposed concrete surfaces.
 - 5. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh spacing and wire tie laps, where required by design. Offset laps of adjoining widths to prevent continuous laps in either direction.

- F. Reinforce architectural precast concrete units to resist handling, transportation, and erection stresses.
- G. Prestress tendons for architectural precast concrete units by either pretensioning or post-tensioning methods. Comply with PCI MNL 117.
 - Delay detensioning or post-tensioning of precast, prestressed architectural concrete units until concrete has reached its indicated minimum design release compressive strength as established by test cylinders cured under same conditions as concrete.
 - 2. Detension pretensioned tendons either by gradually releasing tensioning jacks or by heat- cutting tendons, using a sequence and pattern to prevent shock or unbalanced loading.
 - 3. If concrete has been heat cured, detension while concrete is still warm and moist to avoid dimensional changes that may cause cracking or undesirable stresses.
 - 4. Protect strand ends and anchorages with bituminous, zinc-rich, or epoxy paint to avoid corrosion and possible rust spots.
- H. Comply with requirements in PCI MNL 117 and requirements in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.
- Place face mixture to a minimum thickness after consolidation of the greater of 1 inch or 1.5 times the maximum aggregate size, but not less than the minimum reinforcing cover specified.
- J. Place concrete in a continuous operation to prevent seams or planes of weakness from forming in precast concrete units.
 - 1. Place backup concrete mixture to ensure bond with face-mixture concrete.
- K. Thoroughly consolidate placed concrete by internal and external vibration without dislocating or damaging reinforcement and built-in items, and minimize pour lines, honeycombing, or entrapped air on surfaces. Use equipment and procedures complying with PCI MNL 117.
 - Place self-consolidating concrete without vibration according to PCI TR-6, "Interim Guidelines for the Use of Self-Consolidating Concrete in Precast/Prestressed Concrete Institute Member Plants."
- L. Comply with PCI MNL 117 for hot- and cold-weather concrete placement.
- M. Identify pickup points of architectural precast concrete units and orientation in structure with permanent markings, complying with markings indicated on Shop Drawings. Imprint or permanently mark casting date on each architectural precast concrete unit on a surface that will not show in finished structure.
- N. Cure concrete, according to requirements in PCI MNL 117, by moisture retention without heat or by accelerated heat curing using low-pressure live steam or radiant

- heat and moisture. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.
- O. Discard and replace architectural precast concrete units that do not comply with requirements, including structural, manufacturing tolerance, and appearance, unless repairs meet requirements in PCI MNL 117 and Architect's approval.

2.11 FABRICATION TOLERANCES

- A. Fabricate architectural precast concrete units straight and true to size and shape with exposed edges and corners precise and true so each finished panel complies with PCI MNL 117 product tolerances as well as position tolerances for cast-in items.
- B. Fabricate architectural precast concrete units straight and true to size and shape with exposed edges and corners precise and true so each finished panel complies with the following product tolerances:
 - 1. Overall Height and Width of Units, Measured at the Face Exposed to View: As follows:
 - a. 10 feet or under, plus or minus 1/8 inch.
 - b. 10 to 20 feet, plus 1/8 inch, minus 3/16 inch.
 - c. 20 to 40 feet, plus or minus 1/4 inch.
 - d. Each additional 10 feet, plus or minus 1/16 inch.
 - 2. Overall Height and Width of Units, Measured at the Face Not Exposed to View: As follows:
 - a. 10 feet or under, plus or minus 1/4 inch.
 - b. 10 to 20 feet, plus 1/4 inch, minus 3/8 inch.
 - c. 20 to 40 feet, plus or minus 3/8 inch.
 - d. Each additional 10 feet, plus or minus 1/8 inch.
 - 3. Total Thickness or Flange Thickness: Plus 1/4 inch, minus 1/8 inch.
 - 4. Rib Thickness: Plus or minus 1/8 inch.
 - 5. Rib to Edge of Flange: Plus or minus 1/8 inch.
 - 6. Distance between Ribs: Plus or minus 1/8 inch.
 - 7. Variation from Square or Designated Skew (Difference in Length of the Two Diagonal Measurements): Plus or minus 1/8 inch per 72 inches or 1/2 inch total, whichever is greater.
 - 8. Length and Width of Block-outs and Openings within One Unit: Plus or minus 1/4 inch.
 - 9. Location and Dimension of Block-outs Hidden from View and Used for HVAC and Utility Penetrations: Plus or minus 3/4 inch.
 - 10. Dimensions of Haunches: Plus or minus 1/4 inch.
 - 11. Haunch Bearing Surface Deviation from Specified Plane: Plus or minus 1/8 inch.
 - 12. Difference in Relative Position of Adjacent Haunch Bearing Surfaces from Specified Relative Position: Plus or minus 1/4 inch.
 - 13. Bowing: Plus or minus L/360, maximum 1 inch.

- 14. Local Smoothness: 1/4 inch per 10 feet.
- 15. Warping: 1/16 inch per 12 inches of distance from nearest adjacent corner.
- 16. Tipping and Flushness of Plates: Plus or minus 1/4 inch.
- 17. Dimensions of Architectural Features and Rustications: Plus or minus 1/8 inch.
- C. Position Tolerances: For cast-in items measured from datum line location, as indicated on Shop Drawings.
 - 1. Weld Plates: Plus or minus 1 inch.
 - 2. Inserts: Plus or minus 1/2 inch.
 - 3. Handling Devices: Plus or minus 3 inches.
 - 4. Reinforcing Steel and Welded Wire Fabric: Plus or minus 1/4 inch where position has structural implications or affects concrete cover; otherwise, plus or minus 1/2 inch.
 - 5. Reinforcing Steel Extending out of Member: Plus or minus 1/2 inch of plan dimensions.
 - 6. Tendons: Plus or minus 1/4 inch, vertical; plus or minus 1 inch, horizontal.
 - 7. Location of Rustication Joints: Plus or minus 1/8 inch.
 - 8. Location of Opening within Panel: Plus or minus 1/4 inch.
 - 9. Location of Flashing Reglets: Plus or minus 1/4 inch.
 - 10. Location of Flashing Reglets at Edge of Panel: Plus or minus 1/8 inch.
 - 11. Reglets for Glazing Gaskets: Plus or minus 1/8 inch.
 - 12. Electrical Outlets, Hose Bibs: Plus or minus 1/2 inch.
 - 13. Location of Bearing Surface from End of Member: Plus or minus 1/4 inch.
 - 14. Allowable Rotation of Plate, Channel Inserts, and Electrical Boxes: 2-degree rotation or 1/4 inch maximum over the full dimension of unit.
 - 15. Position of Sleeve: Plus or minus 1/2 inch.
 - 16. Location of Window Washer Track or Buttons: Plus or minus 1/8 inch.

2.12 FINISHES

- A. Panel faces shall be free of joint marks, grain, and other obvious defects. Corners, including false joints shall be uniform, straight, and sharp. Finish exposed-face surfaces of architectural precast concrete units to match approved sample panels and as follows:
 - 1. Abrasive-Blast Finish: Use abrasive grit, equipment, application techniques, and cleaning procedures to expose aggregate and surrounding matrix surfaces.
 - 2. Acid-Etched Finish: Use acid and hot-water solution, equipment, application techniques, and cleaning procedures to expose aggregate and surrounding matrix surfaces. Protect hardware, connections, and insulation from acid attach.
- B. Finish exposed top and bottom surfaces of architectural precast concrete units to match face-surface finish.
- C. Finish exposed back surfaces of architectural precast concrete units by smooth, steel-trowel finish.

2.13 SOURCE QUALITY CONTROL

- A. Quality-Control Testing: Test and inspect precast concrete according to PCI MNL 117 requirements. If using self-consolidating concrete, also test and inspect according to PCI TR-6, "Interim Guidelines for the Use of Self-Consolidating Concrete in Precast/Prestressed Concrete Institute Member Plants."
- B. Owner will employ an independent testing agency to evaluate architectural precast concrete fabricator's quality-control and testing methods.
 - 1. Allow Owner's testing agency access to material storage areas, concrete production equipment, concrete placement, and curing facilities. Cooperate with Owner's testing agency and provide samples of materials and concrete mixtures as may be requested for additional testing and evaluation.
- C. Strength of precast concrete units will be considered deficient if units fail to comply with ACI 318 requirements for concrete strength.
- D. Testing: If there is evidence that strength of precast concrete units may be deficient or may not comply with ACI 318 requirements, precaster will employ an independent testing agency to obtain, prepare, and test cores drilled from hardened concrete to determine compressive strength according to ASTM C 42/C 42M.
 - 1. A minimum of three representative cores will be taken from units of suspect strength, from locations directed by Architect.
 - 2. Cores will be tested in an air-dry condition.
 - 3. Strength of concrete for each series of 3 cores will be considered satisfactory if average compressive strength is equal to at least 85 percent of 28-day design compressive strength and no single core is less than 75 percent of 28-day design compressive strength.
 - 4. Test results will be made in writing on same day that tests are performed, with copies to Architect, Contractor, and precast concrete fabricator. Test reports will include the following:
 - a. Project identification name and number.
 - b. Date when tests were performed.
 - c. Name of precast concrete fabricator.
 - d. Name of concrete testing agency.
 - e. Identification letter, name, and type of precast concrete unit(s) represented by core tests; design compressive strength; type of break; compressive strength at breaks, corrected for length-diameter ratio; and direction of applied load to core in relation to horizontal plane of concrete as placed.
- E. Patching: If core test results are satisfactory and precast concrete units comply with requirements, clean and dampen core holes and solidly fill with precast concrete mixture that has no coarse aggregate, and finish to match adjacent precast concrete surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting structural frame or foundation and conditions for compliance with requirements for installation tolerances, true and level bearing surfaces, and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Do not install precast concrete units until supporting cast-in-place building structural framing has attained minimum allowable design compressive strength or supporting steel or other structure is complete.

3.2 INSTALLATION

- A. Install clips, hangers, bearing pads, and other accessories required for connecting architectural precast concrete units to supporting members and backup materials.
- B. Erect architectural precast concrete level, plumb, and square within specified allowable tolerances. Provide temporary supports and bracing as required to maintain position, stability, and alignment as units are being permanently connected.
 - 1. Install temporary steel or plastic spacing shims or bearing pads as precast concrete units are being erected. Tack weld steel shims to each other to prevent shims from separating.
 - 2. Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.
 - 3. Remove projecting lifting devices and grout fill voids within recessed lifting devices flush with surface of adjacent precast surfaces when recess is exposed.
 - 4. Unless otherwise indicated, maintain uniform joint widths of 3/4 inch.
- C. Connect architectural precast concrete units in position by bolting, welding, grouting, or as otherwise indicated on Shop Drawings. Remove temporary shims, wedges, and spacers as soon as practical after connecting and grouting are completed.
 - 1. Do not permit connections to disrupt continuity of roof flashing.
- D. Welding: Comply with applicable AWS D1.1/D1.1M and AWS D1.4 for welding, welding electrodes, appearance, quality of welds, and methods used in correcting welding work.
 - 1. Protect architectural precast concrete units and bearing pads from damage by field welding or cutting operations, and provide noncombustible shields as required.
 - 2. Welds not specified shall be continuous fillet welds, using no less than the minimum fillet as specified by AWS.

- 3. Clean weld-affected metal surfaces with chipping hammer followed by brushing, and apply a minimum 4.0-mil- thick coat of galvanized repair paint to galvanized surfaces according to ASTM A 780.
- 4. Remove, reweld, or repair incomplete and defective welds.
- E. At bolted connections, use lock washers, tack welding, or other approved means to prevent loosening of nuts after final adjustment.
 - Where slotted connections are used, verify bolt position and tightness. For sliding connections, properly secure bolt but allow bolt to move within connection slot. For friction connections, apply specified bolt torque and check 25 percent of bolts at random by calibrated torque wrench.
- F. Grouting Connections: Grout connections where required or indicated. Retain grout in place until hard enough to support itself. Pack spaces with stiff grout material, tamping until voids are completely filled. Place grout to finish smooth, level, and plumb with adjacent concrete surfaces. Keep grouted joints damp for not less than 24 hours after initial set. Promptly remove grout material from exposed surfaces before it affects finishes or hardens.

3.3 ERECTION TOLERANCES

- A. Erect architectural precast concrete units level, plumb, square, true, and in alignment without exceeding the noncumulative erection tolerances of PCI MNL 117, Appendix I.
- B. Erect architectural precast concrete units level, plumb, square, and true, without exceeding the following noncumulative erection tolerances:
 - 1. Plan Location from Building Grid Datum: Plus or minus 1/2 inch.
 - 2. Plan Location from Centerline of Steel: Plus or minus 1/2 inch.
 - 3. Top Elevation from Nominal Top Elevation: As follows:
 - a. Exposed Individual Panel: Plus or minus 1/4 inch.
 - b. Non-Exposed Individual Panel: Plus or minus 1/2 inch.
 - c. Exposed Panel Relative to Adjacent Panel: 1/4 inch.
 - d. Non-Exposed Panel Relative to Adjacent Panel: 1/2 inch.
 - 4. Support Elevation from Nominal Support Elevation: As follows:
 - a. Maximum Low: 1/2 inch.
 - b. Maximum High: 1/4 inch.
 - 5. Maximum Plumb Variation over the Lesser of Height of Structure or 100 Feet: 1 inch.
 - 6. Plumb in Any 10 Feet of Element Height: 1/4 inch.
 - 7. Maximum Jog in Alignment of Matching Edges: 1/4 inch.
 - 8. Joint Width (Governs over Joint Taper): Plus or minus 1/4 inch.
 - 9. Maximum Joint Taper: 3/8 inch.
 - 10. Joint Taper in 10 Feet: 1/4 inch.

- 11. Maximum Jog in Alignment of Matching Faces: 1/4 inch.
- 12. Differential Bowing or Camber, as Erected, between Adjacent Members of Same Design: 1/4 inch.
- 13. Opening Height between Spandrels: Plus or minus 1/4 inch.

3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections and prepare reports:
 - 1. Erection of precast concrete members.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections and prepare test reports.
- C. Field welds will be subject to visual inspections and nondestructive testing according to ASTM E 165 or ASTM E 709. High-strength bolted connections will be subject to inspections.
- D. Testing agency will report test results promptly and in writing to Contractor and Architect.
- E. Repair or remove and replace work where tests and inspections indicate that it does not comply with specified requirements.
- F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.5 REPAIRS

- A. Repair architectural precast concrete units if permitted by Architect. The Architect reserves the right to reject repaired units that do not comply with requirements.
- B. Mix patching materials and repair units so cured patches blend with color, texture, and uniformity of adjacent exposed surfaces and show no apparent line of demarcation between original and repaired work, when viewed in typical daylight illumination from a distance of 20 feet.
- C. Prepare and repair damaged galvanized coatings with galvanizing repair paint according to ASTM A 780.
- D. Wire brush, clean, and paint damaged prime-painted components with same type of shop primer.
- E. Remove and replace damaged architectural precast concrete units when repairs do not comply with requirements.

3.6 CLEANING

- A. Clean surfaces of precast concrete units exposed to view.
- B. Clean mortar, plaster, fireproofing, weld slag, and other deleterious material from concrete surfaces and adjacent materials immediately.
- C. Clean exposed surfaces of precast concrete units after erection and completion of joint treatment to remove weld marks, other markings, dirt, and stains.
 - 1. Perform cleaning procedures, if necessary, according to precast concrete fabricator's recommendations. Clean soiled precast concrete surfaces with detergent and water, using stiff fiber brushes and sponges, and rinse with clean water. Protect other work from staining or damage due to cleaning operations.
 - 2. Do not use cleaning materials or processes that could change the appearance of exposed concrete finishes or damage adjacent materials.

END OF SECTION

SECTION 035400 - CONCRETE FLOOR TOPPING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Self-leveling concrete floor topping.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 033000 CAST-IN-PLACE CONCRETE for concrete slab construction.

1.3 PERFORMANCE REQUIREMENTS

- A. Wet Dynamic Coefficient of Friction: For flooring exposed as a walking surface, provide products with the following values as determined by testing identical products per ANSI/ NFSI B101.3 2012 Test Method for Measuring Wet DCOF of Common Hard-Surface Floor Materials, or ANSI 326.3 American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Materials 2017. Testing by other methods or earlier editions of the specified test method is not acceptable.
 - 1. Wet Dynamic Coefficient of Friction: Not less than 0.43.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for concrete floor toppings.
- D. Minutes of preinstallation conference.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
- B. Mockups: Place concrete floor topping mockups to demonstrate typical joints, surface finish, bonding, texture, tolerances, and standard of workmanship.
 - 1. Build mockups approximately 100 sq. ft. in the location indicated or, if not indicated, as directed by Architect.
 - 2. If Architect determines that mockups do not meet requirements, demolish and remove them from the site and cast others until mockups are approved.
 - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage, mixing with other components, and application.
- B. Store materials to comply with manufacturer's written instructions to prevent deterioration from moisture or other detrimental effects.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation, and other conditions affecting concrete floor topping performance.
 - 1. Place concrete floor topping only when ambient temperature and temperature of base slabs are between 50 and 86 deg F.
- B. Close areas to traffic during topping application and, after application, for time period recommended in writing by manufacturer.

PART 2 - PRODUCTS

2.1 HYDRAULIC-CEMENT-BASED TOPPING

A. Topping: Hydraulic-cement-based, polymer-modified, self-leveling product complying with ASTM C 387, that can be applied in minimum uniform thicknesses of 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

- 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Ardex; K-15 Self-Leveling Concrete Topping.
 - b. BASF Building Systems; Thoro Underlayment, Self-Leveling.
 - c. KOSTER LevelStrong High Strength.
 - d. KOSTER LevelStrong SLU.
 - e. USG; Durock Speed Floor Underlayment.
 - f. USG; Durock Ultra Cap Floor Underlayment.
- 2. Cement Binder: ASTM C 150, portland cement, or hydraulic or blended hydraulic cement as defined by ASTM C 219.
- 3. Compressive Strength: Not less than 4000 psi at 28 days when tested according to ASTM C 109/C 109M.
- 4. Underlayment Additive: Resilient-emulsion product of underlayment manufacturer formulated for use with underlayment when applied to substrate and conditions indicated.
- B. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch; or coarse sand as recommended by underlayment manufacturer.
 - 1. Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.
- C. Water: Potable and at a temperature of not more than 70 deg F.
- D. Reinforcement: For underlayment applied to wood substrates, provide galvanized metal lath or other corrosion-resistant reinforcement recommended in writing by underlayment manufacturer.
- E. Primer: Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.
 - 1. Primer shall have a VOC content of 200 g/L or less when calculated according to 40 CFR 59, Subpart D.
- F. Corrosion-Resistant Coating: Recommended in writing by underlayment manufacturer for metal substrates.
 - 1. Coating shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for conditions affecting performance of concrete floor topping.
- B. Verify that base concrete slabs comply with scratch finish requirements specified in Section 033000 CAST-IN-PLACE CONCRETE.

- C. Verify that base slabs are visibly dry and free of moisture. Test for capillary moisture by the plastic sheet method according to ASTM D 4263.
- D. Proceed with application only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION - GENERAL

- A. At the start of the installation and periodically as work progresses, provide the services of the manufacturer's technical representative at the job site as often as deemed necessary by the manufacturer to advise on all phases of this Work.
- B. Install the system in accordance with manufacturer's published instructions, except where more stringent requirements are specified.

3.3 PREPARATION

- A. Existing Concrete: Remove existing surface treatments and deteriorated and unsound concrete. Mechanically abrade base slabs to produce a heavily scarified surface profile with an amplitude of 1/4 inch.
 - 1. Prepare and clean existing base slabs according to concrete floor topping manufacturer's written instructions. Fill voids, cracks, and cavities in base slabs.
 - 2. Mechanically remove contaminants from existing concrete that might impair bond of floor topping.
 - 3. Saw cut contraction and construction joints in existing concrete to a depth of 1/2 inch and fill with semirigid joint filler.
- B. Fill non-moving cracks and joints as recommended by the concrete underlayment materials manufacturer.
- C. Concrete Underlayment Over Concrete Slab: Prime porous surfaces of 11% (minimum) absorption with primer. Comply with underlayment concrete manufacturer's recommendations.

3.4 INSTALLATION

- A. Mix materials by methods and in proportions recommended by manufacturer.
- B. Maximum depth of concrete underlayment shall be 2 in. Minimum depth shall be 1/4 in. Add aggregates as recommended by manufacturer for underlayment depth over 1 in.
- C. Install control joints following manufacturer's recommendations in locations indicated on the Drawings.
- D. Allow underlayment to cure properly. Block off traffic and protect floor underlayment from physical damage during curing.

E. Test for dryness by taping 24 x 24 in. sections of plastic to concrete underlayment surface. After approximately 16 hours of curing, if no condensation occurs, the installation shall be considered dry and ready to receive finish flooring.

3.5 PROTECTING AND CURING

- A. General: Protect freshly placed concrete floor topping from premature drying and excessive cold or hot temperatures.
- B. Evaporation Retarder: Apply evaporation retarder to concrete floor topping surfaces in hot, dry, or windy conditions before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying floor topping, but before float finishing.
- C. Begin curing immediately after finishing concrete floor topping. Cure by according to concrete floor topping manufacturer's written instructions:

3.6 JOINT FILLING

- A. Prepare and clean contraction joints and install semirigid joint filler, according to manufacturer's written instructions, once topping has fully cured.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semirigid joint filler full depth of contraction joints. Overfill joint and trim semirigid joint filler flush with top of joint after hardening.

3.7 REPAIRS

A. Defective Topping: Repair and patch defective concrete floor topping areas, including areas that have not bonded to concrete substrate.

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Services: Testing and inspecting of completed applications of concrete floor toppings shall take place in successive stages, in areas of extent and using methods as follows:
 - 1. Sample Sets: At point of placement, a set of 3 molded-cube samples shall be taken from the topping mix for the first 1000 sq. ft., plus 1 set of samples for each subsequent 5000 sq. ft. of topping, or fraction thereof, but not less than 6 samples for each day's placement. Samples shall be tested according to ASTM C 109 for compliance with compressive-strength requirements.
 - Concrete floor topping shall be tested for delamination by dragging a steel chain over the surface.

- 3. Concrete floor topping shall be tested for compliance with surface flatness and levelness tolerances.
- C. Remove and replace applications of concrete floor topping where test results indicate that it does not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

END OF SECTION

SECTION 040100 MASONRY MAINTENANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Applicable provisions of the Conditions of the Contract and Division 1, General Requirements, govern work in this Section.

1.2 DESCRIPTION OF WORK

- A. This section describes Masonry work on portions of the existing building; new construction Masonry work is specified in other sections.
- B. The work of this Section includes all plant, labor, materials, equipment, testing and services necessary to complete the work shown on the drawings, schedules, and keynotes, as specified herein, and as may be required by conditions and authorities having jurisdiction, including, but not limited to, the following:
 - 1. Remove and restore exterior masonry where new cap flashings are being installed.
 - 2. Prepare and repoint mortar joints.
 - 3. Clean and prepare the joints, and then install new sealant in masonry facade joints in the change in elevation walls above lower sections of roof.
 - 4. Remove and reset loose bricks and concrete masonry units under roof edge blocking.
 - 5. Fill hollow core masonry units under roof edge blocking with mortar prior to installing the blocking the blocking is specified elsewhere.
- 1.3 RELATED WORK SPECIFIED ELSEWHERE Entire Project Specification with specific reference to those sections noted above and as follows:

A. 061000 Roof Carpentry
B. 075323 EPDM Roofing

C. 076200 Sheet Metal Flashing & Specialties

D. 077200 Roof Accessories

E. 013113 & Divisions 21, 22, 23 and 26 Mechanical and Electrical

1.4 QUALITY ASSURANCE

A. Installer Qualifications:

- A firm (Installer) with at least 5 continuous years experience performing work similar to that required for this project, employing personnel skilled in the work specified.
 - a. The Installer shall directly employ the personnel performing the work of this section.

- b. The Installer shall have a supervisor in the work area when work is in progress. The Supervisor shall have a minimum of 5 years experience with work similar in nature and scope to this project, and speak fluent English.
 - 1. Submit the Supervisor's resume upon request.
- The Installer shall provide a reference list of at least three previously completed projects of comparable size and similar design, within fifty miles of this project, which may be observed by representatives of the Owner:
 - a. The reference list shall include at a minimum, the completion date, a description of the work performed, the Owner's name contact person phone number and address and the Architect's name contact person and phone number.
 - b. Submit the reference list upon request.
- B. Material Quality: Obtain each type of material from a single source to ensure consistent quality, color, pattern, and texture.
- C. Pre-construction: Attend the pre-construction meeting and discuss the following:
 - 1. How and when the masonry work will be performed and coordinated with other work.
 - 2. How roof & building surfaces will be protected, and how the building will be kept watertight as masonry work progresses.
 - 3. Weather to anticipate during construction.
 - 4. The availability of materials, personnel, equipment and facilities needed to proceed and complete the work on schedule.
 - 5. A schedule for Manufacturer and Architect inspections.

1.5 SUBMITTALS

- A. Submit the following items far enough in advance to obtain approval prior to performing any other work on site:
 - 1. A pre-work site and building inspection report with photos, to document conditions before any other work starts on site.
 - 2. Manufacturer's technical literature for all materials.
 - 3. Test reports and certifications substantiating compliance with specification requirements if requested by the Architect.
 - 4. Samples to show sizes, grade and color, prior to mock-up erection, of each new exposed masonry material. Include the full range of colors and textures needed in the samples.
 - a. Bricks: four samples of solid colors, twelve samples of blended colors.
 - b. Mortar: four 6 inch long 1/2 inch wide strips set in metal or plastic channels.
 - c. Anchors: four pieces of each type of anchor.

- B. Simultaneously provide all roof related submittals needed for this project, for all technical sections, collated by section. Incomplete or incorrect submittals will not be reviewed.
 - 1. Submittals shall be prepared and made by the firm that will perform the actual work.
 - 2. Provide electronic submittals via an on-line submittal exchange program if one is established for this project; if an on-line program is not established, provide the submittals on portable USB drives in pdf format, organized in folders by Section.
 - a. Do not make submittals via email
 - b. Do not include Safety Data Sheets with the technical submittals.
 - 2. Safety Data Sheets: Simultaneously provide all Safety Data Sheets needed for this project, for all specification sections collated by section, in three ring binders. Provide two binders for each building.
- C. Payment requisitions will not be processed until all submittals are received and approved.

1.5 JOB MOCK UPS

- A. Prepare mock-ups of masonry work in actual job locations.
 - 1. For brick rebuilding provide 4 foot long mockups.
 - 2. For repointing provide 2 foot square mockups to show how the joints will be cut, and 2 foot square mockups to show new pointing.
 - 3. For sealant joints provide 2 foot long mockups to show how the joints will be prepared, and 2 foot long mockups to show new backer rod and sealant.
- B. Construct each mock up with its associated roof and wall flashings, to show the following:
 - 1. The color, size and type of each masonry unit and mortar used to set it.
 - 2. Workmanship quality.
 - 3. The size and spacing of weep inserts.
 - 4. Flashings built into the masonry.
 - 5. Related materials and their installation techniques to fully establish a quality standard for the work.
- C. Mock-ups shall be constructed to establish the minimum acceptable standard of materials and workmanship, and to assure that completed work which matches the mock ups will be fully functional and serve the purpose for which it was designed.
- D. Approved mock-ups may be left in place and incorporated into the permanent installation. Rejected mock-ups shall be removed and replaced until an acceptable mock up is approved.
- E. Do not proceed with masonry work until mock-ups are installed, inspected and approved in writing.
- 1.6 DELIVERY, STORAGE AND HANDLING

- A. Carefully pack, handle, and ship masonry units and accessories in suitable packs or pallets or in heavy cartons.
- B. Deliver material to the site in the Manufacturer's original and unopened containers and packaging, bearing labels which identify the types and names of the products and Manufacturers. Unload and handle to prevent chipping and breakage.
- C. Protect masonry materials and aggregates during storage and construction from excess wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials.
- D. Protect grout, mortar and cement products from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Protect liquid components from freezing.
- E. Do not overload the structure when storing materials on the roof.
- F. Protect roof surfaces where material and equipment is placed on them, and where construction traffic occurs, with 6 mil fire retardant polyethylene, covered with 1-1/2 inch thick foam insulation, overlaid with 2 by 10 wooden planks.

1.7 GUARANTEE

- A. Provide a written Contractor's Guarantee which guaranties that all work will remain free of material and workmanship defects and in a watertight condition for five years beginning upon Final Completion:
 - 1. Defects include but are not limited to the following: leakage, delamination, lifting, loosening, splitting, cracking, joint separation and movement.
 - 2. Guarantee coverage shall provide the repairs and modifications necessary to enable the work to perform as guaranteed.
 - 3. Guarantee coverage shall include removing and replacing items installed as part of the original work, if removal is needed to make repairs.
- B. Provide one Guarantee that covers "all work performed" when a single contractor is awarded work specified in multiple Sections.
- C. The Guarantee shall take effect no more than 30 days before the satisfactory completion of all punch list work.
- D. The Contractor's Surety Company may add a rider to the Performance Bond which clarifies that Performance Bond Coverage expires two years after Final Completion; i.e., Performance Bond Coverage does not run for the entire five year term of the Contractor's Guarantee.

1.8 JOB CONDITIONS

- A. Perform masonry work only when the air temperature is 40 degrees F and above and will remain so until the masonry has dried, but for not less than 72 hours after work ends.
- B. Erect temporary covers over pedestrian walkways and at building entrances and exits which will remain active as the work progresses.
- C. Prevent mortar from staining the face of adjoining masonry and other building surfaces; immediately remove any which falls or spills. Protect sills, ledges and projections from mortar droppings.
- D. Protect roof surfaces where material and equipment is placed on them, and where construction traffic occurs, with 6 mil fire retardant polyethylene, covered with 1-1/2 inch thick foam insulation, overlaid with 2 by 10 wooden planks.
- E. Coordinate masonry removal and restoration with the installation of new flashings.
- F. Prevent masonry work from rapid drying during hot weather. Use burlap to shield fresh masonry from direct sunlight, and mist fresh masonry with potable water so it cures slowly for at least 72 hours.
 - 1. Remove and replace any new masonry that develops shrinkage cracks, or isn't bonded well to adjoining masonry.

PART 2 - PRODUCTS

2.1 GENERAL

A. Manufacturer's products are named to establish the basis of design quality required. Equal products supplied by other manufacturer's may be submitted for approval and used.

2.2 MASONRY UNITS

A. Face Brick: Severe weather (SW) grade face brick and accessories, including special bricks for lintels, arches, corners, and other special conditions, to match the color, surface texture, shape and size of existing bricks.

2.3 MORTAR

- A. General Construction Mortar:
 - 1. Type S, custom colored, non-staining masonry cement containing Type I Portland cement meeting ASTM C150 and Type S hydrated lime meeting ASTM C207.
 - 2. Natural or manufactured sand aggregate selected to match the size, texture, graduation and color of the existing mortar aggregate, meeting ASTM C 144.
 - 3. Clean potable water, free of oils, acids, alkalis and organic matter.

- 4. Use General Construction Mortar to fill hollow core masonry under roof eave wood and metal blocking assemblies.
- B. Pointing Mortar: Factory blended Type N masonry cement, aggregate and custom coloring agent, ready to use when mixed with clean potable water, as supplied by Spec-Mix.
- 2.4 CONCRETE: 3,000 psi Portland cement concrete with sand and gravel aggregate, to construct new steps inside the upper roof bulkhead access doors.

2.5 MISCELLANEOUS MATERIALS

- A. Anchors: Fabricated from Type 304 stainless steel to match existing.
- B. Sealant: High performance, solvent free, formulated and moisture curing silylterminated polyether sealant, ASTM C-920, Type S, Grade NS, Class 25, NovaLink construction sealant by ChemLink, color as selected.
- Backer Rod: Closed cell polyethylene foam, non-absorbent, compressible, chemically inert rod.
- D. Weep Inserts: Full height head joint inserts formed of a polypropylene honey comb, three-eighths inch thick, Hohmann & Barnard, Inc. #QV Quadro-Vent.

PART 3 - EXECUTION

3.1 GENERAL

- A. Perform masonry repointing and cleaning to comply with the U.S. Department of the Interior, National Park Services Historic Preservation Briefs # 1 and # 2.
- B. Carefully perform work so the structural integrity of masonry adjoining the work is preserved. Simultaneously remove only limited sections of existing masonry; support and protect masonry remaining next to and above the removal areas.
- C. Completely remove and replace existing masonry that moves, or if cracks form in the mortar joints between the masonry units, or within the masonry units.
- D. Cure all mortar by misting it with potable water to maintain it in a damp condition for not less than 72 hours. Shield fresh mortar from direct sunlight with wet burlap, and prevent fresh mortar from prematurely drying during the curing period. Remove and replace mortar joints that dry pre-maturely.
- E. Cut and remove existing masonry using hand and machine methods. Equip each cutting machine with a separate dedicated vacuum and manufacturer's blade guard vacuum attachment, and control the amount of dust produced so there are no visible plumes. Comply with OSHA crystalline silica standards for construction.

F. Do not overcut brick head joints and allow the blade to nick the bricks; remove and replace bricks damaged during the cutting and repointing preparation process at no cost to the Owner.

3.2 MORTAR MIXES

A. Measurement and Mixing:

- 1. Measure general construction mortar materials when dry by volume using a pail or similar container. Do not measure with a shovel.
 - a. Mix mortar using 1 part mortar cement and 3 parts sand aggregate.
 - b. Thoroughly mix cement and aggregate in a clean mechanical batch mixer before adding water; then continue mixing and add only enough water to produce a workable mix.
 - c. Do not mix mortar by hand.
- 2. Mix factory blended pointing mortar in a clean mechanical batch mixer, adding only enough water to produce a workable mix.
 - a. Do not mix mortar by hand.
- 3. Use mortar within 45 minutes of final mixing; do not re-temper or use partially hardened material.
- B. Mix and install mortar with the same ingredients used to produce the approved mockup. Do not adjust the color or proportions without written approval. Do not use admixtures of any kind in the mortar unless specifically approved.

3.3 BRICK REMOVAL AND REPLACEMENT

- A. Simultaneously remove only limited sections of existing brick masonry; support and protect masonry remaining next to and above the removal areas.
- B. Carefully remove bricks on a piece-by-piece basis. Cut out full units from joint to joint and to permit replacement with full size units. Clean the edges of the remaining bricks, to remove all mortar, dust, and loose debris in preparation for rebuilding.
- C. Install new cap flashings and wall flashing extensions, properly lapped under and connected to the existing wall flashings, as indicated on the drawings and specified elsewhere, before installing new bricks. Install the flashings so a full wythe of new brick will fit flush with the existing wall surface.
- D. Wet bricks which have initial rates of absorption (suction) greater than 30 grams per 30 square inches per minute, (in accordance with ASTM C 67), to ensure the bricks are nearly saturated with water, but surface dry when laid.
- E. Fit and install new bricks to match the original bond and course pattern. Use a motor driven diamond blade wet saw to cut bricks with clean, sharp unchipped edges.
- F. Lay replacement bricks with completely filled bed, head and collar joints. Butter the ends with sufficient mortar to fill the head joints and shove the bricks into place.

- G. Install new bricks with mortar joints to match the width of the adjoining brick joints. Tool the new joints to match existing joints in surrounding brickwork.
- H. Do not cut off the backs of the new bricks if a full wythe of brick does not fit. Notify the Architect and obtain his direction before proceeding further.

3.4 REPOINTING EXISTING MASONRY

A. Joint Preparation:

- 1. Remove existing mortar and foreign material from the mortar joints to a minimum depth of 1 inch, and deeper where needed to expose sound unweathered mortar.
- 2. Remove mortar from the sides of the joints to provide joints with square backs and to expose the masonry for contact with the pointing mortar. Brush or vacuum the joints to remove dirt and loose debris.
- 3. Remove mortar and other foreign material from the surface of masonry adjacent to the joint.
- 4. Do not spall the edges of adjacent masonry or widen the joints. Replace any masonry which is damaged.

B. Joint Pointing:

- 1. Rinse the joint surfaces with water to remove dust and mortar particles just prior to repointing. Time the rinse, so when repointing occurs, excess water has evaporated and the existing masonry is damp but free of standing water.
- 2. Apply pointing mortar in 1/2 inch thick layers, and thoroughly compact each layer before adding the next layer, to completely fill each joint.
- 3. Slightly recess pointing mortar from the face of the adjacent masonry units. Do not spread mortar on the edges or faces of the masonry. Do not featheredge the mortar.
- 4. Tool repointed joints when the mortar is thumbprint hard. Remove excess mortar from the edges of the joints with a soft bristle brush.

C. Cleaning:

- 1. Immediately after the mortar has fully hardened, thoroughly clean masonry surfaces of excess mortar and foreign matter using stiff nylon or bristle brushes and clean water.
- 2. Do not use metal scrapers or brushes. Do not use acid or alkali cleaning agents. Do not pressure-wash the masonry or new pointing mortar.

3.5 CONCRETE STEPS

A. Form and cast the new steps in place, to provide 10 inch deep treads and maximum 7-1/2 inch risers, the full width of the bulkhead access doors.

3.6 SEALANT JOINTS

- A. Carefully remove existing sealant and back up material from within the joints to a minimum depth of 1-1/2 inches, and from the surface of adjoining masonry at the edges of the joints.
 - 1. Use hand tools and work to avoid damage to adjoining masonry.
 - 2. Replace adjoining masonry damaged during sealant removal work.
- B. Install new backer rod without puncturing or tearing it, to snuggly fill the joint at a depth to yield a sealant joint twice as wide as it is deep.
 - 1. Do not twist backer rods, or install multiple pieces of undersized rod, when the correct size rod is not onsite.
- C. Mask the edges of all joints prior to installing sealant. Push sealant into the joint to completely fill it, tool the sealant to produce a slightly concave, neat recessed joint, and remove joint masking before excess sealant sets.

3.7 CLEANING, PROTECTION AND WATERTIGHTNESS

- A. Inspect the interior and exterior of the building and grounds, and submit a written report with photos to document any pre-existing leakage or damage, prior to performing any work.
- B. The Owner will conduct a similar inspection at the completion of the work, and the Contractor will be charged for all leaks and damage that were not documented in the Contractor's report, or repaired to the Owners satisfaction at the Contractor's expense.
- C. Provide any equipment, material and labor necessary to protect the site, the building, its contents and occupants, pedestrians, and surrounding landscaped and paved areas from damage due to the construction work or from inclement weather during construction.
- D. Do not perform work during inclement weather. Protect incomplete work and the building from damage by inclement weather which may occur unexpectedly. Make all work areas watertight at the end of each day's work.
- E. Clean up all litter, refuse, rubbish, scrap materials and debris at least twice a day; at noon and at the end of the work day, so the roof and site are neat, orderly and workmanlike. Place the debris in a dumpster, and remove the dumpster from the site as soon as it is full or no longer being used.
- F. Carefully and thoroughly clean the entire roof to remove all residual debris when all work is complete. After cleaning the roof, thoroughly clean all drain sumps, drain lines, leader heads and leaders. Do not allow debris to enter the drainage system.

END OF SECTION

SECTION 040120 - MASONRY RESTORATION AND CLEANING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Repairing clay and stone masonry, including replacing damaged units as indicated on Drawings.
 - 2. Repointing mortar joints, removing existing mortar and replacing with new color mortar.
 - 3. Cleaning exposed clay and stone masonry surfaces, including decorative stonework.
 - 4. Provide for repair or replacement of clay and stone masonry broken or damaged during disassembly and reconstruction. Contractor shall be responsible for damage resulting from work of this Section.
 - 5. Provide shoring and bracing required to maintain stability of masonry during work of this Section. Coordinate with requirements of Section 011000 GENERAL REQUIREMENTS.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 024100 DEMOLITION for demolition, removal and salvage requirements, to the extent not specified in this Section.
 - 2. Section 042000 UNIT MASONRY for new clay masonry veneer.
 - 3. Section 076200 SHEET METAL FLASHING AND TRIM for metal flashing installed in or on restored masonry.
 - 4. Section 079200 JOINT SEALANTS for sealing joints in restored masonry.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.
- B. Samples for Verification: Before erecting mockup, submit samples of the following:
 - 1. Each type of exposed masonry unit to be used for replacing existing units.
 - a. For each brick type, provide straps or panels containing at least four bricks.
 - b. For each stone type, provide straps or panels containing at least four stones.
 - 2. Each type of sand used for pointing mortar.

- a. For blended sands, provide samples of each component and blend.
- b. Identify sources, both supplier and quarry, of each type of sand.
- 3. Each type of pointing mortar in the form of sample mortar strips, 6 inches long by 1/2 inch wide, set in aluminum or plastic channels.
 - a. Include with each sample a list of ingredients with proportions of each.

 Identify sources, both supplier and quarry, of each type of sand and brand names of cementitious materials and pigments if any.
- 4. Each type of anchor, insert, dowel, and attachment, full size.
- 5. Each type of masonry patching compound in the form of briquettes, at least 3 inches long by 1-1/2 inches wide. Document each sample with manufacturer and stock number or other information necessary to order additional material.
- C. Restoration Program: For each phase of restoration process, provide detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of restoration work including protection of surrounding materials on building and Project site.
 - 1. Include methods for keeping pointing mortar damp during curing period.
 - 2. If materials and methods other than those indicated are proposed for any phase of restoration work, provide a written description, including evidence of successful use on comparable projects, and a testing program to demonstrate their effectiveness for this Project.
- D. Cleaning Program: Describe cleaning process in detail, including materials, methods, and equipment to be used and protection of surrounding materials on building and Project site, and control of runoff during operations.
 - 1. If materials and methods other than those indicated are proposed for cleaning work, provide a written description, including evidence of successful use on comparable projects, and a testing program to demonstrate their effectiveness for this Project.

1.4 QUALITY ASSURANCE

- A. Chemical Manufacturer Qualifications: A firm regularly engaged in producing masonry cleaners that have been used for similar applications with successful results, and with factory-trained representatives who are available for consultation and Project-site inspection and assistance at no additional cost.
- B. Source Limitations: Obtain each type of material for masonry restoration (face brick, stone, cement, sand, etc.) from one source with resources to provide materials of consistent quality in appearance and physical properties.
- C. Preconstruction Testing Service: Owner will engage a qualified independent testing agency to test the following. Provide test specimens and assemblies as indicated.
 - 1. Replacement Brick: For each proposed type of replacement brick, according to sampling and testing methods in ASTM C 67 for compressive strength, 24-hour cold-water absorption, 5-hour boil absorption, saturation coefficient, and initial rate of absorption (suction).

- Existing Brick: For each type of existing brick indicated for replacement, according to testing methods in ASTM C 67 for compressive strength, 24-hour cold-water absorption, 5-hour boil absorption, saturation coefficient, and initial rate of absorption (suction). Carefully remove existing bricks from locations designated by Architect.
- D. Mockups: Prepare mockups of restoration and cleaning as follows to demonstrate aesthetic effects and qualities of materials and execution. Prepare mockups on existing walls under same weather conditions to be expected during remainder of the Work.
 - 1. Repair an area approximately 36 inches high by 48 inches wide for each type of masonry material indicated to be rebuilt or replaced.
 - 2. Patch three small areas at least 1 inch in diameter for each type of masonry material indicated to be patched.
 - 3. Clean an area approximately 25 sq. ft. in area for each type of masonry and surface condition.
 - a. Test cleaners and methods on samples of adjacent materials for possible adverse reactions unless cleaners and methods are known to have deleterious effect.
 - b. Allow a waiting period of not less than seven days after completion of sample cleaning to permit a study of sample panels for negative reactions.
 - 4. Rake out joints in two separate areas approximately 36 inches high by 72 inches wide for each type of repointing required and repoint one of the two areas.
- E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry units to Project site strapped together in suitable packs or pallets or in heavy-duty cartons.
- B. Deliver other materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.
- C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- D. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.
- E. Store lime putty covered with water in sealed containers.
- F. Store sand where grading and other required characteristics can be maintained and contamination avoided.

1.6 PROJECT CONDITIONS

A. Repoint mortar joints and repair masonry only when air temperature is between and 40 and 90 deg F and is predicted to remain so for at least 7 days after completion of work.

- B. Cold-Weather Requirements: Comply with the following procedures for masonry repair and mortar-joint pointing:
 - 1. When air temperature is below 40 deg F, heat mortar ingredients, masonry repair materials, and existing masonry walls to produce temperatures between 40 and 120 deg F.
 - 2. When mean daily air temperature is below 40 deg F, provide enclosure and heat to maintain temperatures above 32 deg F within the enclosure for 7 days after repair and pointing.
- C. Hot-Weather Requirements: Protect masonry repair and mortar-joint pointing when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 90 deg F and above.
- D. Patch masonry only when air and surface temperatures are between and 55 and 100 deg F and are predicted to remain above 55 deg F for at least 7 days after completion of work. On days when air temperature is predicted to go above 90 deg F, schedule patching work to coincide with time that surface being patched will be in shade or during cooler morning hours.
- E. Clean masonry surfaces only when air temperature is 40 deg F and above and is predicted to remain so for at least 7 days after completion of cleaning.

1.7 SEQUENCING AND SCHEDULING

- A. Order replacement materials at earliest possible date, to avoid delaying completion of the Work.
- B. Order sand for repointing mortar immediately after approval of Samples or mockups. Take delivery of and store at Project site a sufficient quantity of sand to complete Project.
- C. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in masonry units to comply with Part 3 "Masonry Unit Patching and Repairs" Article. Patch holes in mortar joints to comply with Part 3 "Repointing Masonry" Article.

PART 2 - PRODUCTS

2.1 MASONRY MATERIALS

- A. Face Brick and Accessories: Provide face brick and accessories, including specially molded, ground, cut, or sawed shapes where required to complete masonry restoration work.
 - 1. Provide units with colors, surface texture, size, and shape to match existing brickwork and with physical properties not less than those determined from preconstruction testing of selected existing units.
 - a. For replacement brick at existing building provide brick to match existing as approved by Architect.
 - b. For existing brickwork that exhibits a range of colors, provide brick that matches that range rather than brick that matches an individual color within that range.

- 2. Provide units with colors, surface texture, and physical properties to match Architect's sample. Match existing units in size and shape.
 - a. For sample that exhibits a range of colors, provide brick that matches that range rather than brick that matches an individual color within that range.
- 3. Provide specially molded shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
- 4. Provide specially ground units, shaped to match patterns, for arches and where indicated.
- B. Building Brick: Provide building brick complying with ASTM C 62, of same vertical dimension as face brick, for masonry work concealed from view.
 - 1. Grade SW where in contact with earth.
 - 2. Grade SW, MW, or NW for concealed backup.
- C. Stone: Reuse existing salvaged stones, where available, and as follows:
 - 1. Varieties, Cut and Finish: To match existing stones, as approved by Architect.
 - 2. For existing stone that exhibits a range of colors, finishes, sizes, or shapes, provide stone that matches that range rather than stone that matches an individual color, finish, size, or shape within that range.

2.2 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150, Type I or Type II.
 - 1. Provide white cement containing not more than 0.60 percent total alkali when tested according to ASTM C 114.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Mortar Sand: ASTM C 144, unless otherwise indicated.
 - 1. Color: Provide natural sand or ground marble, granite, or other sound stone; of color necessary to produce required mortar color.
 - 2. For pointing mortar, provide sand with rounded edges.
 - 3. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands, if necessary, to achieve suitable match.
- D. Mortar Pigments: Natural and synthetic iron oxides, compounded for mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.
 - Available Products: Subject to compliance with requirements, manufacturers offering
 products that may be incorporated into the Work include, but are not limited to, the
 following:
 - a. SGS Mortar Colors: Solomon Grind-Chem Services, Inc.
 - b. True Tone Mortar Colors: Davis Colors, a Subsidiary of Rockwood Industries, Inc.

E. Water: Potable, clean and free from injurious amount of oil, alkali, organic matter or other deleterious material.

2.3 PAINT REMOVERS

- A. Alkaline Paste Paint Remover: Manufacturer's standard alkaline paste formulation for removing paint coatings from masonry.
 - 1. Available Products:
 - a. American Building Restoration Products, Inc.; 800 Brush Grade.
 - b. Diedrich Technologies Inc.; 606/606X Extra Thick Multi-Layer Paint Remover.
 - c. Hydrochemical Techniques, Inc.; Hydroclean Heavy Duty Paint Remover (HT-716).
 - d. Price Research, Ltd.; Price Heavy Duty Paint Stripper.
 - e. ProSoCo; Sure Klean Heavy-Duty Paint Stripper.
- B. Covered or Skin-Forming Alkaline Paint Remover: Manufacturer's standard covered or skin-forming alkaline formulation for removing paint coatings from masonry.
 - 1. Available Products:
 - a. American Building Restoration Products, Inc.; Grip 'N Strip 800 F.A.
 - b. Diedrich Technologies Inc.; 404 Rip-Strip.
 - c. Dumond Chemicals, Inc.; Peel Away 1 System.
 - d. ProSoCo; Enviro Strip #2.
- C. Solvent-Type Paint Remover: Manufacturer's standard water-rinsable, solvent-type gel formulation for removing paint coatings from masonry.
 - 1. Available Products:
 - a. American Building Restoration Products, Inc.; No. 3 Grip 'N Strip.
 - b. Diedrich Technologies Inc.; 505 Special Coatings Stripper.
 - c. Dominion Restoration, Inc.; Dominion Multi-Layer Paint & Graffiti Remover.
 - d. Dumond Chemicals, Inc.; Peel Away 2.
 - e. Hydrochemical Techniques, Inc.; Hydroclean Solvent Paint Remover (HT-300).
 - f. Price Research, Ltd.; Price Strip-All.
 - g. ProSoCo; Sure Klean Fast Acting Paint Stripper.
- D. Low-Odor, Solvent-Type Paint Remover: Manufacturer's standard low-odor, water-rinsable solvent-type gel formulation, containing no methanol or methylene chloride, for removing paint coatings from masonry.
 - 1. Available Products:
 - a. American Building Restoration Products, Inc.; 800 No Lye Grip 'N Strip.
 - b. Dumond Chemicals, Inc.; Peel Away 6.
 - c. ProSoCo; Enviro Klean NMC.

2.4 CLEANING MATERIALS

- A. Water: Potable, clean and free from injurious amount of oil, alkali, organic matter or other deleterious material.
- B. Hot Water: Heat water to a temperature of 140 to 160 deg F.
- C. Job-Mixed Detergent Solution: Solution prepared by mixing 2 cups of trisodium phosphate (TSP), 1/2 cup of laundry detergent, and 20 quarts of hot water for every 5 gal. of solution required.
- D. Job-Mixed Mold, Mildew, and Algae Remover: Solution prepared by mixing 2 cups of trisodium phosphate (TSP), 5 quarts of 5 percent sodium hypochlorite (bleach), and 15 quarts of hot water for every 5 gal. of solution required.
- E. Nonacidic Gel Cleaner: Manufacturer's standard gel formulation, with pH between 6 and 9, that contains detergents and chelating agents and is specifically formulated for cleaning masonry surfaces.
 - Available Products:
 - a. Price Research, Ltd.; Price Marble Cleaner-Gel.
 - b. ProSoCo; Sure Klean 942 Masonry Cleaner.
 - c. Dumond Chemicals, Inc.; Ultimate Stone and Masonry Cleaner.
- F. Nonacidic Liquid Cleaner: Manufacturer's standard mildly alkaline liquid cleaner formulated for removing mold, mildew, and other organic soiling from ordinary building materials, including polished stone, brick, aluminum, plastics, and wood.
 - 1. Available Products:
 - a. Dominion Restoration, Inc.; Bio-Cleanse.
 - b. Dumond Chemicals, Inc.; Safe n' Easy Architectural Cleaner/Restorer.
 - c. Price Research, Ltd.; Price Non-Acid Masonry Cleaner.
 - d. ProSoCo; Enviro Klean Restoration Cleaner.
- G. Mild Acidic Cleaner: Manufacturer's standard mildly acidic cleaner containing no hydrochloric, hydrofluoric, or sulfuric acid; or chlorine bleaches.
 - 1. Available Products:
 - a. Diedrich Technologies Inc.; Envirorestore 100.
 - b. Dominion Restoration, Inc.; DR-60 Stone and Masonry Cleaner.
 - c. Dumond Chemicals, Inc.; Safe n' Easy Heavy Duty Restoration Cleaner.
 - d. ProSoCo; Sure Klean Light-Duty Restoration Cleaner.
- H. Acidic Cleaner: Manufacturer's standard acidic masonry restoration cleaner composed of hydrofluoric acid blended with other acids, detergents, wetting agents, and inhibitors.
 - 1. Available Products:

- a. American Building Restoration Products, Inc.; 801 Heavy Duty Masonry Cleaner.
- b. Diedrich Technologies Inc.; 101 Masonry Restorer.
- c. Hydrochemical Techniques, Inc.; Hydroclean Brick, Granite, Sandstone and Terra Cotta Cleaner (HT-626).
- d. ProSoCo; Sure Klean Heavy-Duty Restoration Cleaner, Sure Klean 1028 Restoration Cleaner or Sure Klean Restoration Cleaner.
- I. Two-Part Chemical Cleaner: Manufacturer's standard system consisting of potassium or sodium hydroxide based, alkaline prewash cleaner and acidic afterwash cleaner that does not contain hydrofluoric acid.
 - 1. Available Products:
 - a. ProSoCo; Sure Klean 766 Limestone & Masonry Prewash and Afterwash.

2.5 MISCELLANEOUS MATERIALS

- A. Masonry Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching masonry, is vapor- and water permeable, exhibits low shrinkage, and develops high bond strength to all types of masonry.
 - 1. Formulate patching compound used for patching brick in colors and textures to match brick being patched. Provide number of colors needed to enable matching each brick.
 - 2. Available Products:
 - a. Cathedral Stone Products, Inc.; Jahn Restoration Mortar.
 - b. Edison Coatings, Inc.; Custom System 45.
 - c. Bonstone Materials Corp., Stone Repair.
- B. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film-forming, strippable masking material for protecting glass, metal, and polished stone surfaces from damaging effects of acidic and alkaline masonry cleaners.
 - 1. Available Products:
 - a. American Building Restoration Products, Inc.; LM 130 Acid Shield.
 - b. Diedrich Technologies Inc.: Diedrich Acid Guard.
 - c. Price Research, Ltd.; Price Mask.
 - d. ProSoCo; Sure Klean Strippable Masking.
- C. Masonry Repair Anchors, Expansion Type: Mechanical fasteners designed for masonry veneer stabilization consisting of 1/4-inch- diameter, Type 316 stainless-steel rod with brass expanding shells at each end and water-shedding washer in the middle. Expanding shells shall be designed to provide positive mechanical anchorage to veneer on one end and backup masonry on the other.
 - 1. Available Products:
 - a. BLOK-LOK, a Hohmann & Barnard Company; Torg-Lok.
 - b. Dur-O-Wal, a Hohmann & Barnard Company; Dur-O-Wal Repair Anchor.

- c. Hohmann & Barnard, Inc.; #521RA-B Restoration Anchor.
- D. Masonry Repair Anchors, Spiral Type: Type 304 stainless-steel spiral rods designed to anchor to backing and veneer. Anchors are flexible in plane of veneer but rigid perpendicular to it.
 - 1. Provide adhesive-installed anchors complete with manufacturer's standard epoxy adhesive and injection tubes, screens, sleeves, or other devices required for installation.
 - 2. Provide driven-in anchors designed to be installed in drilled holes and relying on screw effect rather than adhesive to secure them to backup and veneer.
 - 3. Available Products:
 - a. Dur-O-Wal, a Hohmann & Barnard Company; Dur-O-Flex.
 - b. Heckmann Building Products, Inc.; #391 Spiro Remedial Tie.
 - c. Helifix Ltd.; Helifix HRT60 or Helifix HRT80.
 - d. Hohmann & Barnard, Inc.; Helix Spiro-Ties.
- E. Stone Anchors: Type and size indicated or, if not indicated, to match existing anchors in size and type. Fabricate anchors and dowels from ASTM A 167, Type 304 stainless steel.
 - 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. Halfen USA.
 - b. Heckmann Building Products.
 - c. Hohmann & Barnard, Inc.
 - 2. Adhesives, for Stone Anchors and Pins: ASTM C 881, Types I, II, IV & V, Grade 1, high modulus, high strength, moisture-insensitive, high-viscosity epoxy adhesive.
 - a. Basis of Design: Sika; Sikadur 31, Hi-Mod Gel, or approved equal by anchor manufacturer.
- F. Stone-to-Stone Adhesive: 2-part polyester or epoxy-resin stone adhesive with a 15- to 45-minute cure at 70 deg F or 1-part cementitious stone adhesive, recommended by adhesive manufacturer for type of stone repair indicated, and matching stone color.
 - Available Products: Subject to compliance with requirements, manufacturers offering
 products that may be incorporated into the Work include, but are not limited to, the
 following:
 - a. Two-Part Polyester or Epoxy:
 - 1) Akemi North America; Akepox.
 - 2) Bonstone Materials, Inc.; A-199-T/B-439-T.
 - 3) Edison Coatings, Inc.; Flexi-Weld 520T.
 - a) Aggregate for mixing with epoxy: Granite of the same color as the area to be patched, reduced to a fine aggregate with a mallet. Use particles that pass through a No. 50 sieve and are retained on a No. 200 sieve.
 - b. One-Part Cementitious Stone Adhesive:

- 1) Cathedral Stone Products, Inc.; Jahn Restoration Adhesive.
- G. Joint Sealant and Backer Rods: Refer to Section 079200 JOINT SEALANTS.

2.6 MORTAR MIXES

- A. Preparing Lime Putty: Slake quicklime and prepare lime putty according to appendix to ASTM C 5 and manufacturer's written instructions.
- B. 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.
 - Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.
- C. Colored Mortar: Produce mortar of color required by using selected ingredients. Do not alter specified proportions without Architect's approval.
 - 1. Mortar Pigments: Where mortar pigments are indicated, do not exceed a pigment-tocement ratio of 1:10 by weight.
 - 2. Color: Match existing, or as otherwise directed by Architect.
- D. Do not use admixtures of any kind in mortar, unless otherwise indicated.
- E. Mortar Proportions: Mix mortar materials in the following proportions:
 - 1. Pointing Mortar for Brick: 1 part portland cement, 2 parts lime, and 6 parts sand.
 - a. Add mortar pigments to produce mortar colors required.
 - 2. Rebuilding (Setting) and Pointing Mortar, for Stone: Comply with ASTM C 270, Proportion Specification, Type N, unless otherwise indicated, with cementitious material limited to portland cement and lime.
 - a. Mix: 1 part portland cement, 2 parts lime, and 6-7 parts sand.
 - b. Add mortar pigments to produce mortar colors required.

2.7 CHEMICAL CLEANING SOLUTIONS

- A. Dilute chemical cleaners with water to produce solutions not exceeding concentration recommended by chemical cleaner manufacturer.
- B. Acidic Cleaner Solution for Brick: Dilute with water to produce hydrofluoric acid content of 3 percent or less, but not greater than that recommended by chemical cleaner manufacturer.

- C. Acidic Cleaner Solution for Unpolished Stone: Dilute with water to produce hydrofluoric acid content of 3 percent or less, but not greater than that recommended by chemical cleaner manufacturer.
 - 1. Use only on unpolished granite, unpolished dolomite marbles, and siliceous sandstone.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from masonry restoration work.
 - Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of restoration and cleaning work.
- B. Comply with chemical cleaner manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical cleaning solutions from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.
 - Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless chemical cleaners being used will not damage adjacent surfaces. Use materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
 - 2. Keep wall wet below area being cleaned to prevent streaking from runoff.
 - 3. Do not clean masonry during winds of sufficient force to spread cleaning solutions to unprotected surfaces.
 - 4. Neutralize and collect alkaline and acid wastes for disposal off Owner's property.
 - 5. Dispose of runoff from cleaning operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.
- C. Prevent mortar from staining face of surrounding masonry and other surfaces.
 - 1. Cover sills, ledges, and projections to protect from mortar droppings.
 - 2. Keep wall area wet below rebuilding and pointing work to discourage mortar from adhering.
 - 3. Immediately remove mortar in contact with exposed masonry and other surfaces.
 - 4. Clean mortar splatters from scaffolding at end of each day.

3.2 UNUSED ANCHOR OR EMBEDDED STEEL REMOVAL

- A. Remove embedded masonry anchors, brackets, wood nailers, and other extraneous items no longer in use unless identified as historically significant or indicated to remain.
 - 1. Remove items carefully to avoid spalling or cracking masonry.
 - 2. If item cannot be removed without damaging surrounding masonry, cut off item flush with surface and core drill surrounding masonry and item as close around item as practical.

3. Patch holes where items were removed unless directed to remove and replace units.

3.3 MASONRY REMOVAL AND REPLACEMENT

- A. At locations indicated, remove masonry units that are damaged, spalled, or deteriorated. Carefully demolish or remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.
 - 1. When removing single bricks, remove material from center of brick and work toward outside edges.
- B. Support and protect remaining masonry that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.
- C. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose masonry units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.
- D. Remove in an undamaged condition as many whole bricks and stones as possible.
 - 1. Remove mortar, loose particles, and soil from brick and stone by cleaning with hand chisels, brushes, and water.
 - Remove sealants by cutting close to brick and stone with utility knife and cleaning with solvents.
 - 3. Store brick and stone for reuse, as indicated.
 - Deliver cleaned brick and stone not required for reuse to Owner, unless otherwise directed.
- E. Clean masonry surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.
- F. Install replacement masonry into bonding and coursing pattern of existing masonry, match existing mortar joints for size. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.
- G. Lay replacement masonry units with completely filled bed, head, and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Maintain joint width for replacement units to match existing joints.
 - 1. Bricks: Wet both replacement and surrounding bricks that have ASTM C 67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min. Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.
 - 2. Tool exposed mortar joints in repaired areas to match joints of surrounding existing masonry work.
 - 3. Rake out mortar used for laying brick and stone before mortar sets and point new mortar joints in repaired area to comply with requirements for repointing existing masonry, and at same time as repointing of surrounding area.

3.4 REANCHORING VENEERS

A. Install masonry repair anchors in horizontal mortar joints and according to manufacturer's written instructions. Install at not more than 16 inches o.c. vertically and 32 inches o.c. horizontally, unless otherwise indicated. Install at locations to avoid penetrating flashing.

B. Recess anchors at least 5/8 inch from surface of mortar joint and fill recess with pointing mortar.

3.5 MASONRY UNIT PATCHING AND REPAIRS

- A. Patch the following masonry units:
 - 1. Units indicated to be patched.
 - 2. Units with holes.
 - 3. Units with chipped edges or corners.
 - 4. Units with small areas of deep deterioration.
- B. Remove and replace existing patches, unless otherwise indicated or approved by Architect.
- C. Patching Bricks:
 - 1. Remove loose material from brick surface. Remove additional material so patch will not have feathered edges and will be at least 1/4 inch thick, but not less than recommended by patching compound manufacturer.
 - 2. Mask or remove surrounding mortar joints if patch will extend 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 by patching compound manufacturer, but not less than 1/4 inch or more than 2 inches 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 surface plane of surrounding 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.
- D. Stone Repairs and Partial Stone Replacement (Dutchman Repair):
 - 1. At locations indicated, remove rectangular portion of stone units. Carefully remove stone by making vertical and horizontal saw cuts at face of stone and demolishing corner portion of stone unit to depth required for fitting partial replacement (Dutchman). Make edges of stone at cuts smooth and square to each other and to finished surface. Make back of removal area flat and parallel to stone face.
 - 2. Remove mortar from joints that abut area of stone removal to same depth as stone was removed. Remove loose mortar particles and other debris from surfaces to be bonded and surfaces of adjacent stone units that will receive mortar by cleaning with stiff-fiber brush.
 - 3. Trim partial replacement (Dutchman) to accurately fit area where stone was removed.
 - 4. Apply stone-to-stone adhesive to comply with adhesive manufacturer's written instructions. Coat bonding surfaces of existing stone and partial replacement, completely filling all crevices and voids.
 - Apply partial replacement or fit stone fragments onto building stone while adhesive is still tacky and hold fragment securely in place until adhesive has cured.

- b. Use shims, clamps, wedges, or other devices as necessary to align face of partial replacement with face of stone unit being repaired.
- 5. After adhesive has fully cured, further anchor partial replacements where indicated with 1/4-inch- diameter, plain stainless-steel rods set into 1/4-inch- diameter holes drilled at a 45-degree downward angle through face of stone. Center and space anchor rods between 3 and 5 inches apart and at least 2 inches from any edge. Insert rods at least 2 inches into backing stone and 2 inches into partial replacements with end countersunk at least 3/4 inch from exposed face of stone.
- 6. Clean residual adhesive from exposed surfaces.

3.6 CLEANING MASONRY, GENERAL

- A. Examination: Examine all surfaces scheduled for cleaning, for roughness, contaminants, unsound structural substrates, or other conditions that may impair the application. Notify the Engineer in writing of any such conditions; do not continue work until directed by Architect on how to proceed.
 - 1. Monitor weather prior to work to ensure that air temperatures remain between 50°F and 85°F, or as recommended by the manufacturer of chemical compounds and proprietors of cleaning methods.
 - 2. Ensure that building components not to be cleaned, adjacent persons, property, and plant life are protected from all cleaning activities and wind drift. Test adjacent non-masonry materials for reaction with cleaning materials. Mask all windows, ornamental fixtures, hardware, wood doors, or other non-masonry surfaces.
- B. Proceed with cleaning in an orderly manner; work from top to bottom of each scaffold width and from one end of each elevation to the other.
- C. Use only those cleaning methods indicated for each masonry material and location.
 - Do not use wire brushes or brushes that are not resistant to chemical cleaner being used.
 Do not use plastic-bristle brushes if natural-fiber brushes will resist chemical cleaner being used.
 - 2. Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip. Adjust pressure and volume to ensure that cleaning methods do not damage masonry.
 - a. Equip units with pressure gages.
 - b. Provide spray applications as follows:
 - 1) Low-Pressure Spray: 100 to 400 psi; 4 to 6 gpm.
 - 2) Medium-Pressure Spray: 400 to 800 psi; 4 to 6 gpm.
 - 3) High-Pressure Spray: 800 to 1200 psi; 4 to 6 gpm.
 - 3. For chemical cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray tip.
 - 4. For water spray application, use fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.
 - 5. For high-pressure water spray application, use fan-shaped spray tip that disperses water at an angle of at least 40 degrees.
 - 6. For heated water spray application, use equipment capable of maintaining temperature between 140 and 160 deg F at flow rates indicated.

- 7. For steam application, use steam generator capable of delivering live steam at nozzle.
- D. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces.
- E. Removing Plant Growth: Completely remove plant, moss, and shrub growth from masonry surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing to dry as long as possible before removal. Remove loose soil and debris from open masonry joints to whatever depth they occur.
- F. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to cleaning methods being used. Extraneous substances include paint, calking, asphalt, and tar.
 - 1. Carefully remove heavy accumulations of material from surface of masonry with a sharp chisel. Do not scratch or chip masonry surface.
 - 2. Remove paint and calking with alkaline paint remover.
 - a. Comply with requirements for paint removal.
 - b. Repeat application up to two times if needed.
 - 3. Remove asphalt and tar with solvent-type paint remover.
 - a. Apply only to asphalt and tar by brush without prewetting.
 - b. Allow paint remover to remain on surface for 10 to 30 minutes.
 - c. Rinse off with water using low-pressure spray.
 - d. Repeat application if needed.

G. Water Application Methods:

- 1. Water Soak Application, for Stone: Soak stone surfaces by applying water continuously and uniformly to limited area for time indicated. Apply water at low pressures and low volumes in multiple fine sprays using perforated hoses or multiple spray nozzles. Erect a protective enclosure constructed of polyethylene sheeting to cover area being sprayed.
- 2. Spray Applications, for Brick and Stone: Unless otherwise indicated, hold spray nozzle at least 6 inches from surface of stone and apply water in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.
- H. Steam Wash: Apply steam to masonry surfaces at pressures not exceeding 80 psi. Hold nozzle at least 6 inches from surface of masonry and apply steam in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.
- I. Chemical Cleaner Application Methods: Apply chemical cleaners to masonry surfaces to comply with chemical cleaner manufacturer's written instructions; use brush or spray application methods, at Contractor's option. Do not spray apply at pressures exceeding 50 psi. Do not allow chemicals to remain on surface for periods longer than those indicated or recommended by manufacturer.
- J. Rinse off chemical residue and soil by working upward from bottom to top of each treated area at each stage or scaffold setting. Periodically during each rinse, test pH of rinse water running off of cleaned area to determine that chemical cleaner is completely removed.

- 1. Apply neutralizing agent and repeat rinse, if necessary, to produce tested pH of between 6.7 and 7.5.
- K. After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.

3.7 PAINT REMOVAL

- A. Paint Removal with Alkaline Paste Paint Remover:
 - 1. Apply paint remover to dry, painted masonry with brushes.
 - 2. Allow paint remover to remain on surface for period recommended by manufacturer.
 - 3. Rinse with water applied by low-pressure spray to remove chemicals and paint residue.
 - 4. Repeat process, if necessary, to remove all paint.
 - 5. Apply acidic cleaner to masonry, while surface is still wet, using low-pressure spray equipment or soft-fiber brush. Let cleaner remain on surface for period recommended by chemical cleaner manufacturer.
 - 6. Rinse with cold water applied by low-pressure spray to remove chemicals and soil.
- B. Paint Removal with Covered or Skin-Forming Alkaline Paint Remover:
 - Apply paint remover to dry, painted masonry with trowel, spatula, or as recommended by manufacturer.
 - 2. Apply cover, if required by manufacturer, per manufacturer's written instructions.
 - Allow paint remover to remain on surface for period recommended by manufacturer or as determined in test panels.
 - 4. Scrape off paint and remover and collect for disposal.
 - 5. Rinse with water applied by low-pressure spray to remove chemicals and paint residue.
 - 6. Use alkaline paste paint remover according to "Paint Removal with Alkaline Paste Paint Remover" Paragraph, if necessary, to remove remaining paint.
 - 7. Apply acidic cleaner to masonry, while surface is still wet, using low-pressure spray equipment or soft-fiber brush. Let cleaner remain on surface for period recommended by chemical cleaner manufacturer.
 - 8. Rinse with cold water applied by low-pressure spray to remove chemicals and soil.
- C. Paint Removal with Solvent-Type Paint Remover:
 - 1. Apply thick coating of paint remover to painted masonry with natural-fiber cleaning brush, deep-nap roller, or large paint brush.
 - 2. Allow paint remover to remain on surface for period recommended by manufacturer. Agitate periodically with stiff-fiber brush.
 - 3. Rinse with cold water applied by low-pressure spray to remove chemicals and paint residue.

3.8 MASONRY CLEANING

- A. Cold-Water Wash: Use cold water applied by low-pressure spray.
- B. Cold Water Soak:
 - 1. Apply cold water by intermittent soaking.
 - 2. Use perforated hoses or other means that will apply a fine water mist to entire surface being cleaned.

- 3. Apply water in cycles with at least 30 minutes between cycles.
- 4. Continue water application until surface encrustation has softened sufficiently to permit its removal by water wash, as indicated by cleaning tests.
- 5. Remove soil and softened surface encrustation from masonry with cold water applied by low-pressure spray.
- C. Hot-Water Wash: Use hot water applied by low-pressure spray.
- D. Steam Cleaning: Apply steam at pressures not exceeding 80 psi.
- E. Detergent Cleaning:
 - 1. Wet masonry with water applied by low-pressure spray.
 - 2. Scrub masonry with detergent solution using medium-soft brushes until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from mortar joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that masonry surface remains wet.
 - 3. Rinse with water applied by low-pressure spray to remove detergent solution and soil.
 - 4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.
- F. Mold, Mildew, and Algae Removal:
 - 1. Wet masonry with water applied by low-pressure spray.
 - 2. Apply mold, mildew, and algae remover by brush or low-pressure spray.
 - 3. Scrub masonry with medium-soft brushes until mold, mildew, and algae are thoroughly dislodged and can be removed by rinsing. Use small brushes for mortar joints and crevices. Dip brush in mold, mildew, and algae remover often to ensure that adequate fresh cleaner is used and that masonry surface remains wet.
 - 4. Rinse with water applied by low-pressure spray to remove mold, mildew, and algae remover and soil.
 - 5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.
- G. Nonacidic Gel Chemical Cleaning:
 - 1. Wet masonry with water applied by low-pressure spray.
 - 2. Apply nonacidic gel cleaner in 1/8-inch thickness by brush, working into joints and crevices. Apply quickly and do not brush out excessively so area will be uniformly covered with fresh cleaner and dwell time will be uniform throughout area being cleaned.
 - 3. Let cleaner remain on surface for period indicated below:
 - a. As recommended by chemical cleaner manufacturer.
 - b. As established by mockup.
 - 4. Remove bulk of nonacidic gel cleaner by squeegeeing into containers for disposal.
 - 5. Rinse with water applied by low-pressure spray to remove chemicals and soil.
 - 6. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam wash.
- H. Nonacidic Liquid Chemical Cleaning:

- 1. Wet masonry with water applied by low-pressure spray.
- 2. Apply cleaner to masonry in two applications by brush. Let cleaner remain on surface for period indicated below:
 - a. As recommended by chemical cleaner manufacturer.
 - b. As established by mockup.
 - c. Two to three minutes.
- 3. Rinse with water applied by low-pressure spray to remove chemicals and soil.
- 4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam wash.
- I. Mild Acidic Chemical Cleaning:
 - 1. Wet masonry with cold water applied by low-pressure spray.
 - 2. Apply cleaner to masonry in two applications by brush or low-pressure spray. Let cleaner remain on surface for period indicated below:
 - a. As recommended by chemical cleaner manufacturer.
 - b. As established by mockup.
 - c. Two to three minutes.
 - 3. Rinse with cold water applied by low-pressure spray to remove chemicals and soil.
 - 4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam wash.

3.9 REPOINTING MASONRY

- A. Rake out and repoint mortar joints to the following extent:
 - 1. All joints in areas indicated.
 - 2. Joints where mortar is missing or where they contain holes.
 - Cracked joints where cracks can be penetrated at least 1/4 inch by a knife blade 0.027 inch thick.
 - 4. Cracked joints where cracks are 1/8 inch or more in width and of any depth.
 - 5. Joints where they sound hollow when tapped by metal object.
 - 6. Joints where they are worn back 1/4 inch or more from surface.
 - 7. Joints where they are deteriorated to point that mortar can be easily removed by hand.
 - 8. Joints, other than those indicated as sealant-filled joints, where they have been filled with substances other than mortar.
- B. Do not rake out and repoint joints where not required.
- C. Rake out joints as follows:
 - 1. Remove mortar from joints to depth of 2 times joint width, but not less than 1/2 inch or not less than that required to expose sound, unweathered mortar.
 - 2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.

- 3. Do not spall edges of masonry units or widen joints. Replace or patch damaged masonry units as directed by Architect.
 - a. Cut out mortar by hand with chisel and mallet. Do not use power-operated grinders without Architect's written approval based on submission by Contractor of a satisfactory quality-control program and demonstrated ability of operators to use tools without damaging masonry. Quality-control program shall include provisions for supervising performance and preventing damage due to worker fatigue.
 - b. Cut out center of mortar bed joints using angle grinders with diamond-impregnated metal blades. Remove remaining mortar by hand with chisel and mallet. Strictly adhere to written quality-control program. Quality-control program shall include provisions for demonstrating ability of operators to use tools without damaging masonry, supervising performance, and preventing damage due to worker fatigue.
- D. Notify Architect of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.
- E. Point joints as follows:
 - 1. Rinse masonry-joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen masonry-joint surfaces before pointing.
 - 2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch until a uniform depth is formed. Fully compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
 - 3. After low areas have been filled to same depth as remaining joints, point all joints by placing mortar in layers not greater than 3/8 inch. Fully compact each layer and allow to become thumbprint hard before applying next layer.
 - a. Where existing bricks have worn or rounded edges, slightly recess finished mortar surface below face of masonry to avoid widened joint faces.
 - b. Take care not to spread mortar over edges onto exposed masonry surfaces or to featheredge mortar.
 - 4. When mortar is thumbprint hard, tool joints to match original appearance of joints. Remove excess mortar from edge of joint by brushing.
- F. Cure mortar by maintaining in thoroughly damp condition for at least 72 hours including weekends and holidays.
 - 1. Acceptable curing methods include covering with wet burlap and plastic sheeting, periodic hand misting, and periodic mist spraying using system of pipes, mist heads, and timers.
 - 2. Adjust curing methods to ensure that pointing mortar is damp throughout its depth without eroding surface mortar.
- G. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

3.10 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, spray applied at low pressure.
 - 1. Do not use metal scrapers or brushes.
 - 2. Do not use acidic or alkaline cleaners.
- B. Wash adjacent woodwork and other nonmasonry surfaces. Use detergent and soft brushes or cloths.
- C. Clean masonry debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.
- D. Sweep and rake adjacent pavement and grounds to remove masonry debris. Where necessary, pressure wash surfaces to remove mortar, dust, dirt, and stains.

3.11 FIELD QUALITY CONTROL

A. Inspectors: Owner will engage qualified independent inspectors to perform inspections and prepare test reports. Coordinate with inspectors and provide access. Allow inspectors use of lift devices and scaffolding, as needed, to perform inspections.

END OF SECTION

SECTION 040120.64-1 BRICK AND UNIT MASONRY REPOINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes repointing joints with mortar.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at [Project site].

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

A. Quality-control program.

1.5 QUALITY ASSURANCE

- A. Brick Masonry Repointing Specialist Qualifications: Engage an experienced brick masonry repointing 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 repointing 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. Repointing: Rake out joints in two separate areas, each approximately 36 inches high by 48 inches wide, unless otherwise indicated, for each type of repointing required, and repoint one of the areas.

PART 2 - PRODUCTS

2.1 MORTAR MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I or Type II, except Type III may be used for cold-weather construction; white 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.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 2. Cemex S.A.B. de C.V.
 - 3. Essroc.
 - 4. Hanson Brick and Tile; Lehigh Hanson.
 - 5. Holcim (US) Inc.

- 6. Lafarge North America Inc.
- 7. QUIKRETE.
- D. Mortar Cement: ASTM C1329/C1329M.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 2. Lafarge North America Inc.
- E. Mortar Sand: ASTM C144.
 - 1. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.
 - 2. Color: Provide 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.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 2. Davis Colors.
 - 3. LANXESS Corporation.
 - 4. Solomon Colors, Inc.
- G. Water: Potable.

2.2 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.
 - Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again, adding only enough water to produce a damp, unworkable mix that retains its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.
- B. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.
 - 1. Mortar Pigments: Where mortar pigments are indicated, do not add pigment exceeding 10 percent by weight of the cementitious or binder materials, except for carbon black which is limited to 2 percent.
- C. Do not use admixtures in mortar unless otherwise indicated.
- D. Mixes: Mix mortar materials in the following proportions:
 - 1. Pointing Mortar by Volume: ASTM C270, Proportion Specification, 1 part portland cement, 1 part lime, and 6 parts sand.

PART 3 EXECUTION

3.1 PROTECTION

- A. Remove gutters and downspouts and associated hardware adjacent to masonry and store during masonry repointing. Reinstall when repointing is complete.
- B. Provide temporary rain drainage during work to direct water away from building.

3.2 REPOINTING

- A. Rake out and repoint joints to the following extent:
 - 1. Joints at locations of the following defects:
 - a. Holes and missing mortar.
 - b. Cracks that can be penetrated 1/4 inch or more by a knife blade 0.027 inch thick.
 - c. Cracks 1/16 inch or more in width and of any depth.
 - d. Hollow-sounding joints when tapped by metal object.
 - e. Eroded surfaces 1/4 inch or more deep.
 - f. Deterioration to point that mortar can be easily removed by hand, without tools.
 - g. Joints filled with substances other than mortar.
- B. Do not rake out and repoint joints where not required.
- C. Rake out joints as follows:
 - 1. Remove mortar from joints to depth of not less than 1 inch and not less than that required to expose sound, unweathered mortar. Do not remove unsound mortar more than 2 inches deep; consult Architect/Engineer for direction.
 - 2. Remove mortar from brick and other masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
 - 3. Do not spall edges of brick or other masonry units or widen joints. Replace or patch damaged brick or other masonry units as directed by Architect/Engineer.
- D. Notify Architect of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.
- E. Pointing with Mortar:
 - 1. Rinse joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen joint surfaces before pointing.
 - 2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch until a uniform depth is formed. Fully compact each layer, and allow it to become thumbprint hard before applying next layer.
 - 3. After deep areas have been filled to same depth as remaining joints, point joints by placing mortar in layers not greater than 3/8 inch. Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing masonry units have worn or rounded edges, slightly recess finished mortar surface below face of masonry to avoid widened joint faces. Take care not to spread mortar beyond joint edges onto exposed masonry surfaces or to featheredge the mortar.
 - 4. When mortar is thumbprint hard, tool joints to match original appearance of joints as demonstrated in approved mockup. Remove excess mortar from edge of joint by brushing.
 - 5. Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.

- 6. Hairline cracking within mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.
- F. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

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 040120.64

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Concrete masonry units.
 - 2. Face brick.
 - 3. Embedded flashing.
 - 4. Mortar and grout.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 061600 SHEATHING for gypsum sheathing on cold-formed metal framing.
 - 2. Section 072100 THERMAL INSULATION for cavity wall insulation.
 - 3. Section 072700 AIR BARRIERS for membrane air barrier.
 - 4. Section 078440 FIRE-RESISTIVE JOINT SYSTEMS for fire-resistive joint systems openings in masonry walls and at heads of masonry walls.
 - 5. Section 079200 JOINT SEALANTS for sealing control and expansion joints in unit masonry.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For the following:
 - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
 - 2. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
- C. Samples for Verification: For each type and color of the following:
 - 1. Exposed concrete masonry units.
 - 2. Face brick, in the form of straps of five or more bricks.
 - 3. Pigmented mortar. Make Samples using same sand and mortar ingredients to be used on Project. Label Samples to indicate types and amounts of pigments used.
 - 4. Weep holes/vents.
 - 5. Accessories embedded in masonry.

- D. Qualification Data: For testing agency.
- E. Material Certificates: Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards. Provide for each type and size of the following:
 - 1. Masonry units:
 - a. Include material test reports substantiating compliance with requirements.
 - b. For bricks, include size-variation data verifying that actual range of sizes falls within specified tolerances.
 - For exposed brick, include material test report for efflorescence according to ASTM C 67.
 - d. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
 - 2. Cementitious materials. Include brand, type, and name of manufacturer.
 - 3. Mortar mixes. Include description of type and proportions of ingredients.
 - 4. Grout mixes. Include description of type and proportions of ingredients.
 - 5. Reinforcing bars.
 - 6. Joint reinforcement.
 - 7. Anchors, ties, and metal accessories.
- F. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 - 1. Include test reports, per ASTM C 780 for mortar mixes required to comply with property specification.
 - 2. Include test reports, per ASTM C 1019 for grout mixes required to comply with compressive strength requirement.
- G. Cold-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with cold-weather requirements.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1093 for testing indicated.
- B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.
- C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from a single manufacturer for each cementitious component and from one source or producer for each aggregate.
- D. Preconstruction Testing Service: The Owner will engage a qualified independent testing agency to perform preconstruction testing indicated below. Payment for these services will be made by the Owner. Retesting of materials that fail to meet specified requirements shall be done at Contractor's expense.
 - 1. Prism Test: For each type of construction required, per ASTM C 1314.

- E. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by other means, as acceptable to authorities having jurisdiction.
- F. Sample Panels: Build sample panels to verify selections made under sample submittals and to demonstrate aesthetic effects. Comply with requirements in Division 01 for mockups.
 - 1. Build sample panels for typical exterior and interior walls in sizes approximately 48 inches long by 48 inches high by full thickness.
 - 2. Where masonry is to match existing, erect panels adjacent and parallel to existing surface.
 - 3. Clean one-half of exposed faces of panels with masonry cleaner indicated.
 - 4. Protect approved sample panels from the elements with weather-resistant membrane.
 - 5. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.
 - Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless such deviations are specifically approved by Architect in writing.
- G. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not uses units where such defects, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.
- H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01. Agenda shall include protection of air barrier membrane during construction.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.6 PROJECT CONDITIONS

- A. Protection of Air Barrier Membrane: During construction, protect air barrier membrane from penetrations which allow air to pass through air barrier assemblies. Engage original installer to repair damage promptly using identical materials and methods of installation, and to the satisfaction of the Architect.
- B. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
 - 2. Where 1 wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.
- C. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.
- D. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- E. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.
- F. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS (CMUS)

A. Concrete Masonry Units: ASTM C 90, normal weight unless indicated otherwise manufactured to dimensions 3/8 inch less than nominal dimensions.

B. Shapes: Provide standard shapes indicated and as required for building configuration. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.

2.2 BRICK

- A. Face Brick: ASTM C 216, Grade SW, Type FBS.
 - 1. Trade Reference and Color: As selected by Architect to match existing with multiple shades required.
 - 2. Size (Actual Dimensions): As selected by Architect.
 - 3. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested per ASTM C 67.
 - 4. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
 - 5. Where shown to "match existing," provide face brick matching color range, texture, and size of existing adjacent brickwork.
- B. Building (Common) Brick where Concealed: ASTM C 62, Grade SW.
- C. General: Provide shapes indicated and as follows:
 - 1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
 - 2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
 - 3. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces.
 - 4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
 - 5. Units which are sawn and less than one-half full size shall not be used.

2.3 MORTAR AND GROUT MATERIALS

- A. Regional Materials: Provide aggregate for mortar and grout, cement, and lime that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
- B. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortar.
 - 1. Available Products:
 - a. LanXess; Bayferrox Iron Oxide Pigments.
 - b. Davis Colors; True Tone Mortar Colors.

- c. Solomon Grind-Chem Services, Inc.; SGS Mortar Colors.
- E. Aggregate for Mortar: ASTM C 144. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
- F. Aggregate for Grout: ASTM C 404.
- G. Water: Potable.

2.4 REINFORCEMENT

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.
- B. Masonry Joint Reinforcement, General: ASTM A 951.
 - 1. Interior Walls: Mill-galvanized, carbon steel.
 - 2. Exterior Walls: Hot-dip galvanized, carbon steel.
 - 3. Wire Size and Spacing: As required by Code.
 - 4. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.
- C. Masonry Joint Reinforcement for Multiwythe Masonry:
 - 1. Ladder type with 1 side rod at each face shell of hollow masonry units more than 4 inches in width, plus 1 side rod at each wythe of masonry 4 inches or less in width.

2.5 TIES AND ANCHORS

- A. Materials: Provide ties and anchors specified in subsequent paragraphs that are made from materials that comply with subparagraphs below, unless otherwise indicated.
 - 1. Mill-Galvanized, Carbon-Steel Wire: ASTM A 82; with ASTM A 641/A 641M, Class 1 coating.
 - 2. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82; with ASTM A 153/A 153M, Class B-2 coating.
 - 3. Stainless-Steel Wire: ASTM A 580/A 580M, Type 316.
 - 4. Galvanized Steel Sheet: ASTM A 653/A 653M, Commercial Steel, G60 zinc coating.
 - 5. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
 - 6. Stainless Steel Bars: ASTM A 276 or ASTM A 666, Type 304.
- B. Adjustable Anchors for Connecting to Structure: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
 - 1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch-diameter, hot-dip galvanized steel. Mill-galvanized wire may be used at interior walls, unless otherwise indicated.
- C. Partition Top Anchors: 0.097-inch-thick metal plate with 3/8-inch-diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.
- D. Adjustable Masonry-Veneer Anchors:

- 1. General: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, with structural performance capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.
- 2. Screw-Attached, Masonry-Veneer Anchors, consisting of a wire tie and a metal anchor section:
 - a. Units equal to Pos-I-Tie Brick Veneer Anchoring System by Heckmann Building Products Inc.
 - Anchor Section: Zinc-alloy barrel section with flanged head with wing-nut eye and corrosion-resistant, self-drilling screw. Eye designed to receive wire tie and to serve as head for drilling fastener into framing. Barrel length to suit sheathing thickness, allowing screw to seat directly against framing with flanged head covering hole in sheathing.
 - 2) Wire Ties: Triangular-, rectangular-, or T-shaped wire ties fabricated from 0.188-inch-diameter, hot-dip galvanized steel wire.
 - b. Units equal to HB-213 Adustable Veneer Anchor by Hohmann & Barnard, Inc.
 - 1) Anchor Section: Rib-stiffened, sheet metal plate with 9/32 inch diameter screw holes top and bottom, 2-3/4 inches wide by 3 inches high; with projecting tabs having slotted holes with 1-1/4 inch maximum allowable eccentricity, sized to prevent in-and-out movement beyond allowable tolerances, for inserting vertical legs of wire tie specially formed to fit anchor section.
 - 2) Wire Ties: Rectangular-shaped wire ties fabricated from 0.188-inch-diameter, hot-dip galvanized steel wire.
 - c. Units equal to DW-10-X Veneer Anchoring System by Hohmann & Barnard.
 - 1) Anchor Section: Gasketed sheet metal plate, 1-1/4 inches wide by 6 inches long, with screw holes top and bottom; top and bottom ends bent to form pronged legs of length to match thickness of insulation or sheathing; and raised rib-stiffened strap, 5/8 inch wide by 6 inches long, stamped into center to provide a slot between strap and plate for inserting wire tie. Provide anchor manufacturer's standard, self-adhering, modified bituminous gaskets manufactured to fit behind anchor plate and extend beyond pronged legs.
 - 2) Fabricate sheet metal anchor sections and other sheet metal parts from 0.067-inch-thick, steel sheet, galvanized after fabrication.
 - 3) Wire Ties: Triangular wire ties fabricated from 0.25-inch-diameter, hot-dip galvanized steel wire.
- E. Adjustable Masonry-Veneer Anchors Thermally-Broken:
 - 1. General: Provide thermally-broken anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, with structural performance capable of withstanding a

- 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.
- Screw-Attached, Masonry-Veneer Anchors: Units consisting of a wire tie and a metal anchor section.
 - a. Anchor Section: Stainless steel barrel section, polymer coated screw with hex head with plastic-encapsulated steel wing and corrosion-resistant, self-drilling screw. Wing designed to receive wire tie. Barrel length to suit sheathing thickness, allowing screw to seat directly against framing with flanged head covering hole in sheathing.
 - b. Wire Ties: Triangular-, rectangular-, or T-shaped wire ties fabricated from 0.188-inch-diameter, hot-dip galvanized steel wire.
 - c. Basis-of-Design: 2-Seal Thermal Wing Nut Anchor by Hohmann & Barnard or approved equal by Posi-Tie (thermally broken), or equal.

2.6 MISCELLANEOUS ANCHORS

A. Anchor Bolts: L-shaped steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of dimensions indicated.

2.7 EMBEDDED FLASHING MATERIALS

- A. Flexible Laminated Stainless Steel Flashing:
 - 1. Available Products:
 - a. Hohmann & Barnard, Inc.; Mighty-Flash Stainless Steel Fabric Flashing.
 - b. Illinois Products, Inc.; IPCO Stainless Steel Fabric Flashing.
 - c. STS Coatings, Inc.; Gorilla Flash Stainless Fabric.
 - d. TK Products, Inc.; TK TWF.
 - 2. Basis of Design: York Manufacturing, Inc.; Multi-Flash SS.
 - Materials:
 - a. Type: Stainless steel core with polymer fabric laminated to one stainless steel face with non-asphalt adhesive.
 - b. Stainless steel type: 304, ASTM A666.
 - c. Fabric: Polymer fabric; laminated back face of stainless steel core.

4. Accessories:

- a. Sealant: Provide sealants as recommended by flashing manufacturer.
- b. Splice Tape: Provide minimum 4" wide self-adhering strips and as recommended by flashing manufacturer.
- c. Termination Bar: Provide stainless steel termination bars with sealant catch lip.
- d. Preformed Shapes: Provide Type 304, 0.016 inch (0.40 mm) thick stainless steel preformed end dams, outside and inside corners.
- B. Solder and Sealants for Sheet Metal Flashings: As specified in Section 076200 SHEET METAL FLASHING AND TRIM.

- C. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates. Verify compatibility between flashing materials and substrates.
- D. Transition Strips: Provide long-term compatible 6" wide transition strips to seal embedded flashing terminations to air barrier membrane.
- E. Drip Edge: Provide type 316, 0.016 inch (0.40 mm) thick stainless steel drip edge plates with factory applied adhesive strip for all through-wall flashing conditions. Provide preformed outside and inside corner drip plate corners with smooth uninterrupted soldered seams and hemmed drip edges to maintain continuity. Custom sizes will be required see drawings for profiles required.

2.8 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
- D. Weep/Vent Products: Free-draining mesh; made from polyethylene strands, full height and width of head joint and depth 1/8 inch less than depth of outer wythe; in color selected from manufacturer's standard.
- E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity. Provide strips, full-depth of cavity and 10 inches wide, with dovetail shaped notches 7 inches deep that prevent mesh from being clogged with mortar droppings or equivalent. Available products:
 - 1. Advanced Building Products Inc.; Mortar Break II.
 - 2. Archovations, Inc.; CavClear Masonry Mat.
 - 3. Hohmann & Barnard; MortarTrap.
 - Mortar Net USA. Ltd.: Mortar Net.

2.9 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
 - 1. Available Manufacturers:
 - a. Diedrich Technologies, Inc.
 - b. EaCo Chem, Inc.
 - c. ProSoCo, Inc.

2.10 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. Limit cementitious materials in mortar to portland cement and lime.
- B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
 - 1. For masonry below grade or in contact with earth, use Type M.
 - 2. For reinforced masonry, use Type S.
 - 3. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.
- C. Pigmented Mortar: Use colored cement product. Pigments shall not exceed 10 percent of portland cement by weight.
- D. Grout for Unit Masonry: Comply with ASTM C 476.
 - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
 - 2. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
 - 2. Verify that foundations are within tolerances specified.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

- B. Build chases and recesses to accommodate items specified in this and other Sections.
- C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed. Do not use units cut to less than one-half size.
- E. Do not install concrete masonry units with more than 5 percent damage to the face. Do not install brick units which will show defects after installation.
- F. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- G. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.
- H. Comply with construction tolerances in ACI 530.1/ASCE 6/TMS 602 and with the following:
 - 1. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
 - 2. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
 - 3. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
 - 4. For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch. Do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
 - 5. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.
 - 6. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

3.3 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in bond pattern indicated on Drawings; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs. Prior to installation review bond pattern with Architect.
- C. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

- D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- E. Fill space between steel frames and masonry solidly with mortar, unless otherwise indicated.
- F. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.
- G. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.
 - Install compressible filler in joint between top of partition and underside of structure above.
 - 2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c., unless otherwise indicated.
 - 3. Wedge non-load-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
 - 4. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 078440 FIRE-RESISTIVE JOINT SYSTEMS.

3.4 MORTAR BEDDING AND JOINTING

- A. Lay hollow brick and concrete masonry units as follows:
 - 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
 - 2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
 - 3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
 - 4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.
- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.
- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

3.5 CAVITY WALLS

- A. Bond wythes of cavity walls together using one of the following methods:
 - 1. Masonry Joint Reinforcement: Installed in horizontal mortar joints. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable (two-piece) type reinforcement with continuous horizontal wire in facing wythe attached to ties to allow for differential movement regardless of whether bed joints align.
 - 2. Masonry Veneer Anchors: Comply with requirements for anchoring masonry veneers.

- B. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.
- C. Coordinate and allow access for air and vapor barrier membrane installed in cavity under Section 072700 AIR BARRIERS.

3.6 MASONRY JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches. Space reinforcement not more than 16 inches o.c.
- B. Interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.

3.7 ANCHORING MASONRY TO STRUCTURAL MEMBERS

- A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:
 - 1. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar and other rigid materials.
 - 2. Anchor masonry to structural members with anchors embedded in masonry joints and attached to structure.
 - 3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

3.8 ANCHORING MASONRY VENEERS

- A. Anchor masonry veneers with masonry-veneer anchors to comply with the following requirements:
 - 1. Fasten screw-attached anchors through insulation and sheathing to wall framing and to concrete and masonry backup as applicable with metal fasteners of type indicated.
 - 2. Embed tie sections in masonry joints. Provide air space indicated on the Drawings between back of masonry veneer and face of insulation.
 - 3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
 - 4. Space anchors as required by Code.

3.9 CONTROL AND EXPANSION JOINTS

- A. General: Install control and expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for inplane wall or partition movement.
- B. Form control joints in concrete masonry using one of the following methods:

- Fit bond-breaker strips into hollow contour in ends of concrete masonry units on one side of control joint. Fill resultant core with grout and rake out joints in exposed faces for application of sealant.
- 2. Install preformed control-joint gaskets designed to fit standard sash block.
- 3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar or rake out joint for application of sealant.
- 4. Install temporary foam-plastic filler in head joints and remove filler when unit masonry is complete for application of sealant.
- C. Form expansion joints in brick made from clay or shale as follows:
 - Build flanges of metal expansion strips into masonry. Lap each joint 4 inches in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.
 - 2. Build flanges of factory-fabricated, expansion-joint units into masonry.
 - 3. Build in compressible joint fillers where indicated.
 - Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch
 for installation of sealant and backer rod specified in Section 079200 JOINT
 SEALANTS.
- D. Provide horizontal, pressure-relieving joints by either leaving an air space or inserting a compressible filler of width required for installing sealant and backer rod specified in Section 079200 JOINT SEALANTS but not less than 3/8 inch.
 - 1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

3.10 LINTELS

- A. Install steel lintels where indicated.
- B. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

3.11 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.
- B. Install flashing as follows, unless otherwise indicated:
 - Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
 - 2. At multiwythe masonry walls, including cavity walls, extend flashing through outer wythe, turned up a minimum of 8 inches, and 1-1/2 inches into the inner wythe. Form 1/4-inch hook in edge of flashing embedded in inner wythe.
 - 3. At masonry-veneer walls, extend flashing through veneer, across air space behind veneer, and up face of sheathing at least 8 inches; with upper edge covered with elastomeric membrane, lapping at least 4 inches.
 - 4. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.

- 5. Install air barrier transition strips to seal embedded flashings in masonry to air barrier membrane in accordance with Section 072700 AIR BARRIERS.
- C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.
- D. Install metal drip edge plate in accordance with architectural details and manufacturer's requirements.
- E. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:
 - 1. Use specified weep/vent products to form weep holes.
 - 2. Space weep holes 24 inches o.c., unless otherwise indicated.
- F. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in Part 2 "Miscellaneous Masonry Accessories" Article.
- G. Install vents in head joints in exterior wythes at spacing indicated.

3.12 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

3.13 FIELD QUALITY CONTROL

- A. Inspectors: Owner will engage qualified independent inspectors to perform inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform inspections. Place grout only after inspectors have verified compliance of grout spaces and grades, sizes, and locations of reinforcement.
- B. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections indicated below and prepare test reports. Retesting of materials failing to comply with specified requirements shall be done at Contractor's expense.
- C. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof. Test types as determined by the independent testing and inspection agency.

3.14 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, around penetrations and where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
 - 5. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.
 - 6. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.

3.15 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
 - 1. Crush masonry waste to less than 4 inches in each dimension.
 - 2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Division 31 EARTHWORK.
 - 3. Do not dispose of masonry waste as fill within 18 inches of finished grade.
- C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off the Site.

END OF SECTION

SECTION 042200 - CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Concrete masonry units.
 - 2. Decorative concrete masonry units.
 - 3. Pre-faced concrete masonry units.
 - 4. Steel reinforcing bars.

1.2 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For reinforcing steel. Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315.
- C. Samples: For each type and color of the following:
 - 1. Exposed CMUs.
 - 2. Pre-faced CMUs.
 - 3. Pigmented and colored-aggregate mortar.

1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each type and size of product. For masonry units, include data on material properties.
- B. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 - Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C109/C109M for compressive strength, ASTM C1506 for water retention, and ASTM C91/C91M for air content.
 - 2. Include test reports, according to ASTM C1019, for grout mixes required to comply with compressive strength requirement.

1.5 QUALITY ASSURANCE

A. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects.

1.6 FIELD CONDITIONS

A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 – PRODUCTS

2.1 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.
 - 1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.2 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
 - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
- B. CMUs: ASTM C90.
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 3750 psi.
 - 2. Density Classification: Normal weight unless otherwise indicated.
- C. Concrete Building Brick: ASTM C55.
- D. Pre-faced CMUs: Lightweight hollow concrete units complying with ASTM C90, with manufacturer's standard smooth resinous facing complying with ASTM C744.
 - 1. Size: Manufactured with pre-faced surfaces having 1/16-inch-wide returns of facing to create 1/4-inch-wide mortar joints.
 - 2. Colors and Patterns: As selected by Architect from manufacturer's full range.

2.3 CONCRETE LINTELS

A. Concrete Lintels: ASTM C1623, matching CMUs in color, texture, and density classification; and with reinforcing bars indicated.

2.4 MORTAR AND GROUT MATERIALS

- A. Portland cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of Portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C91/C91M.
- E. Aggregate for Mortar: ASTM C144.
 - 1. White-Mortar Aggregates: Natural white sand or crushed white stone.

- 2. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- F. Aggregate for Grout: ASTM C404.
- G. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C494/C494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
- H. Water: Potable.

2.5 REINFORCEMENT

- A. Uncoated-Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60.
- B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
 - 1. <u>Manufacturers:</u> 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. Dur-O-Wal; a Hohmann & Barnard company.
- C. Masonry-Joint Reinforcement, General: ASTM A951/A951M.
 - 1. Interior Walls: Mill- galvanized, carbon steel.
 - 2. Exterior Walls: Hot-dip galvanized carbon steel.
 - 3. Wire Size for Side Rods: 0.148-inch diameter.
 - 4. Wire Size for Cross Rods: 0.148-inch diameter.
 - 5. Spacing of Cross Rods: Not more than 16 inches o.c.
 - 6. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.

2.6 TIES AND ANCHORS

- A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
 - 1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A82/A82M, with ASTM A153/A153M, Class B-2 coating.
 - 2. Steel Sheet, Galvanized after Fabrication: ASTM A1008/A1008M, Commercial Steel, with ASTM A153/A153M, Class B coating.
 - 3. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- B. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
 - 1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch-diameter, hot-dip galvanized-steel wire.
 - 2. Tie Section: Triangular-shaped wire tie made from 0.187-inch- diameter, hotdip galvanized-steel wire.
- C. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
 - 1. Connector Section: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section; formed from 0.060-inch-thick steel sheet, galvanized after fabrication.

- 2. Tie Section: Triangular-shaped wire tie made from 0.187-inch- diameter, hotdip galvanized-steel wire.
- 3. Corrugated-Metal Ties: Metal strips not less than 7/8 inch wide with corrugations having a wavelength of 0.3 to 0.5 inch and an amplitude of 0.06 to 0.10 inch made from 0.075-inch-thick steel sheet, galvanized after fabrication with dovetail tabs for inserting into dovetail slots in concrete.
- D. Partition Top Anchors: 0.105-inch-thick metal plate with a 3/8-inch-diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.
- E. Rigid Anchors: Fabricate from steel bars 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 inches or with cross pins unless otherwise indicated.
 - 1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A153/A153M.

2.7 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane, or PVC.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D2000, Designation M2AA-805 or PVC, complying with ASTM D2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).

2.8 MASONRY-CELL FILL

- A. Loose-Fill Insulation: Perlite complying with ASTM C549, Type II (surface treated for water repellency and limited moisture absorption) or Type IV (surface treated for water repellency and to limit dust generation).
- B. Lightweight-Aggregate Fill: ASTM C331/C331M.

2.9 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. Use Portland cement-lime or masonry cement mortar unless otherwise indicated.
 - 3. For exterior masonry, use Portland cement-lime or masonry cement mortar.
 - 4. For reinforced masonry, use Portland cement-lime or masonry cement mortar.
 - 5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

- C. Mortar for Unit Masonry: Comply with ASTM C270, Property Specification. Provide the following types of mortar for applications stated unless another type is indicated.
 - 1. For masonry below grade or in contact with earth, use Type S.
 - 2. For reinforced masonry, use Type S.
 - 3. For mortar parge coats, use Type S or Type N.
 - 4. For exterior, above-grade, un-reinforced load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.
 - 5. For interior nonload-bearing partitions, Type N.
- D. Pigmented Mortar: Use colored cement product.
 - 1. Application: Use pigmented mortar for exposed mortar joints with the following units:
 - a. Decorative CMUs.
 - b. Pre-faced CMUs.
- E. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.
 - 1. Application: Use colored-aggregate mortar for exposed mortar joints with the following units:
 - Decorative CMUs.
 - b. Pre-faced CMUs.
- F. Grout for Unit Masonry: Comply with ASTM C476.
 - Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
 - 2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2500 psi.
 - 3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C143/C143M.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.2 TOLERANCES

- A. Dimensions and Locations of Elements:
 - 1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
 - 2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.

3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:

- 1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
- 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
- 3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
- 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
- 5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.

C. Joints:

- 1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
- 2. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
- 3. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

3.3 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- D. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- E. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- F. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.4 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
 - 1. Bed face shells in mortar and make head joints of depth equal to bed joints.
 - 2. Bed webs in mortar in all courses of piers, columns, and pilasters.
 - 3. Bed webs in mortar in grouted masonry, including starting course on footings.
 - 4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.

- B. Lay solid CMUs with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

3.5 MASONRY-JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.

3.6 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:
 - 1. Provide an open space not less than 1/2 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
 - 2. Where anchoring to structures, anchor masonry with anchors embedded in masonry joints and attached to structure.
 - 3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

3.7 REINFORCED UNIT MASONRY

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 - Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
 - 2. Limit height of vertical grout pours to not more than 60 inches.

3.8 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work

areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

- B. Inspections: Special inspections according to Level B in TMS 402/ACI 530/ASCE 5.
 - 1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
 - 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
 - 3. Place grout only after inspectors have verified proportions of site-prepared grout.
- C. Testing Prior to Construction: One set of tests.
- D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.
- E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C140 for compressive strength.
- F. TMS 402/ACI 530/ASCE 5 requires verification of compliance of proportions for site-prepared mortar. Mortar aggregate ratio test in "Mortar Aggregate Ratio Test (Proportion Specification)" Paragraph below verifies ratio of aggregate to cementitious materials but does not indicate what cementitious materials are used. Observation of actual mortar mixing procedures as part of inspection program would provide better quality control.
- G. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C780.
- H. Mortar Test (Property Specification): For each mix provided, according to ASTM C780. Test mortar for mortar air content and compressive strength.
- I. Grout Test (Compressive Strength): For each mix provided, according to ASTM C1019.

3.9 PARGING

- A. Parge exterior faces of below-grade masonry walls, where indicated, in two uniform coats to a total thickness of 3/4 inch. Dampen wall before applying first coat, and scarify first coat to ensure full bond to subsequent coat.
- B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch per foot. Form a wash at top of parging and a cove at bottom.
- C. Damp-cure parging for at least 24 hours and protect parging until cured.

3.10 REPAIRING, POINTING, AND CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
 - 2. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

3.11 MASONRY WASTE DISPOSAL

A. Masonry Waste Recycling: Return broken CMUs to manufacturer for recycling.

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B. Excess Masonry Waste: Remove excess clean masonry waste, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042200

SECTION 044200 - EXTERIOR STONE CLADDING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Dimension stone panels set with individual anchors.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 079200 JOINT SEALANTS for sealing joints in dimension stone cladding system with elastomeric sealants.

1.3 DEFINITIONS

- A. Definitions contained in ASTM C 119 apply to this Section.
- B. Dimension Stone Cladding System: An exterior wall covering system consisting of dimension stone panels together with the anchors, backup structure, sheathing, mortar, fasteners, and sealants used to secure the stone to the building structure and to produce a weather-resistant covering.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Design stone anchors and anchoring systems according to ASTM C 1242.
- B. Structural Performance: Provide dimension stone cladding system capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Wind Loads: Determine loads based on Code requirements.
 - 2. Equipment Loads: Allow for loads due to window cleaning and maintenance equipment.
- C. Seismic Performance: Provide dimension stone cladding system capable of withstanding the effects of earthquake motions determined according to local State Building Code.

- D. Thermal Movements: Provide dimension stone cladding system that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing displacement of stone, opening of joints, overstressing of components, failure of joint sealants and connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime sky heat loss.
 - 1. Temperature Change (Range): 120 deg F ambient; 180 deg F material surfaces.
- E. Horizontal Building Movement (Interstory Drift): Allow for maximum horizontal building movement equal to quotient resulting from dividing floor-to-floor height at any floor by 400.
- F. Safety Factors for Stone: Design dimension stone cladding system to withstand loads indicated without exceeding allowable working stress of stone determined by dividing stone's average ultimate strength, as established by testing, by the following safety factors:
 - 1. Safety Factors for Granite: 3 for uniform loads and 4 for concentrated loads.
 - 2. Safety Factors for Quartz-Based Stone: 8 for uniform loads and 10 for concentrated loads.
- G. Design stone anchors to withstand loads indicated without exceeding allowable working stresses established by the following:
 - 1. For Structural Steel: AISC S335, "Specification for Structural Steel Buildings Allowable Stress Design and Plastic Design with Commentary."
 - 2. For Cold-Formed Steel: AISI SG-973, Part V, "Specification for the Design of Cold-Formed Steel Structural Members."
 - 3. For Cast-in-Place and Postinstalled Fasteners in Concrete: One-fourth of tested capacity when installed in concrete with compressive strength indicated.
 - 4. For Post-Installed Fasteners in Masonry: One-sixth of tested capacity when installed in masonry units indicated.
- H. Limit deflection in each prefabricated assembly caused by indicated loads and thermal movements, acting singly or in combination with one another, to the following maximums:
 - 1. 1/16 inch, measured in plane of wall.
 - 2. 1/720 of assembly's clear span but not more than 1/4 inch (6 mm), measured perpendicular to wall.
- I. Provisions for Fabrication and Erection Tolerances: Allow for fabrication and erection tolerances of building's structural system.
- J. Provision for Deflection of Building Structure: Allow for the following:

- 1. Deflection due to Weight of Dimension Stone Cladding System: Allow for 1/4-inch vertical deflection in 20-foot span of structural members supporting dimension stone cladding system.
- 2. Live Load Deflection: Allow for 1/4-inch vertical deflection, in 20-foot span of structural members supporting dimension stone cladding system, due to live loads imposed on building's structural frame after stone installation.
- K. Control of Corrosion and Staining: Prevent galvanic and other forms of corrosion as well as staining by isolating metals and other materials from direct contact with incompatible materials. Use materials that do not stain exposed surfaces of stone and joint materials.

1.5 SUBMITTALS

- A. Product Data: For each variety of stone, stone accessory, and other manufactured products indicated.
- B. Shop Drawings: Include plans, elevations, and details for all conditions. Show details of fabrication and installation of dimension stone cladding system, including dimensions and profiles of stone units.
 - 1. Show locations and details of joints both within dimension stone cladding system and between dimension stone cladding system and other construction.
 - 2. Include details of mortar joints, sealant joints, and mortar joints pointed with sealant.
 - 3. Show locations and details of anchors and backup structure.
 - 4. For installed dimension stone cladding systems indicated to comply with certain design loads and deflection limits, include structural analysis data signed and sealed by the qualified structural engineer responsible for their preparation.
 - 5. Show adjacent construction for coordination purposes during construction.
- C. Stone Samples for Verification: Sets for each color, grade, finish, and variety of stone required; not less than 12 inches square. Include two or more Samples in each set showing the full range of variations in appearance characteristics expected in the completed Work.
- D. Colored Pointing Mortar Samples for Verification: For each color required, showing the full range of exposed color and texture expected in the completed Work.
- E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- F. Material Test Reports: From a qualified independent testing agency indicating and interpreting test results of the following for compliance with requirements indicated:
 - 1. Stone Test Reports: For each stone variety proposed for use on Project, provide test data indicating compliance with required physical properties including those

- specified by reference to ASTM standards. Include test data for flexural strength based on testing according to ASTM C 880, performed on specimens representative of minimum thickness and finish of installed stone, in both wet and dry conditions. Base reports on testing done within previous five years.
- 2. Anchorage Test Reports: For each variety, finish and anchor type, based on testing according to ASTM C 1354, performed on specimens representative of minimum thickness and finish of installed stone.
- 3. For metal components, indicate chemical and physical properties of metal.
- 4. Sealant Compatibility and Adhesion Test Report: From sealant manufacturer complying with requirements in Section 079200 JOINT SEALANTS. Include interpretation of test results and recommendations for primers and substrate preparation needed for adhesion.
- 5. Preconstruction Sealant Field Test Report: From Installer, complying with requirements in Section 079200 JOINT SEALANTS.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed dimension stone cladding systems similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful inservice performance.
 - 1. Installer's responsibilities include engineering, fabricating, and installing dimension stone cladding system.
 - 2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified structural engineer.
- B. Structural Engineer Qualifications: A structural engineer who is legally qualified to practice in the state that the 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 dimension stone cladding systems that are similar to those indicated for this Project in material, design, and extent.
- C. Source Limitations for Stone: Obtain each variety of stone, regardless of finish, from a single quarry with resources to provide materials of consistent quality in appearance and physical properties.
 - 1. Obtain each variety of stone from a single quarry, whether specified in this Section or in another Section of the Specifications.
- D. Source Limitations for Mortar Materials: Obtain mortar ingredients of uniform quality for each cementitious component from a single manufacturer and each aggregate from one source or producer.
- E. Source Limitations for Other Materials: Obtain each type of stone accessory, sealant, and other material from a single manufacturer for each product.
- F. Preconstruction Stone Testing: The Owner will engage a qualified independent testing agency to perform preconstruction testing indicated below. Payment for these services

will be made by the Owner. Retesting of materials that fail to meet specified requirements shall be done at Contractor's expense.

- 1. Furnish test specimens selected by testing agency from blocks representative of actual materials proposed for incorporation into the Work.
- 2. One set of test specimens will be required for each stone variety, of number and size indicated in referenced standards.
- 3. Stone will be tested for compliance with physical property requirements according to referenced ASTM standards.
- 4. Flexural Strength Tests: ASTM C 880, performed on specimens representative of minimum thickness and finish of installed stone. One set will be tested in both wet and dry conditions.
- 5. Anchorage Tests: ASTM C 1354, performed on specimens representative of minimum thickness and finish of installed stone. One set will be tested for each combination of stone variety, finish, and anchor type.
- 6. Testing agency will report test results in writing to Architect and Contractor.
- G. Welding Standards: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel"; and AWS D1.3, "Structural Welding Code--Sheet Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle stone and related materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, and other causes.
 - 1. Lift with wide-belt slings; do not use wire rope or ropes that might cause staining. Move stone, if required, using dollies with cushioned wood supports.
 - 2. Store stone on wood skids or pallets with nonstaining, waterproof covers. Arrange to distribute weight evenly and to prevent damage to stone. Ventilate under covers to prevent condensation.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates in locations where grading and other required characteristics can be maintained and where contamination can be avoided.

1.8 PROJECT CONDITIONS

- A. Cold-Weather Construction: Do not use frozen materials or materials mixed or coated with ice or frost. Remove and replace dimension stone cladding damaged by frost or freezing conditions. When ambient temperature is within limits indicated, use the following procedures:
 - At 40 deg F and below, produce mortar temperatures between 40 and 120 deg F by heating mixing water and, at temperatures of 32 deg F and below, sand. In heating mortar materials, maintain mixing temperatures within 10 deg F do not

- heat water to above 160 deg F. Maintain temperature of mortar on boards above freezing. Do not apply mortar to stone units or substrates below 32 deg F.
- 2. At 25 to 20 deg F heat both sides of walls under construction. Use windbreaks or enclosures when wind velocity exceeds 15 mph.
- 3. At 20 deg F and below, provide enclosure and auxiliary heat to maintain air temperature above 32 deg F within enclosure. Heat stone so it is above 40 deg F at time of installation.
- B. Cold-Weather Protection: When mean daily temperature is within limits indicated, provide the following protection:
 - 1. 40 to 25 Deg F: Cover dimension stone cladding with a weather-resistant membrane for 48 hours after construction.
 - 2. 25 to 20 Deg F: Cover dimension stone cladding with insulating blankets or provide enclosure and heat to maintain air temperature above 32 deg F within enclosure for 48 hours after construction. Use windbreaks or enclosures when wind velocity exceeds 15 mph.
 - 3. 20 Deg F and below: Provide enclosure and heat to maintain air temperature above 32 deg F within enclosure for 48 hours after construction.

PART 2 - PRODUCTS

2.1 STONE, GENERAL

- A. Regional Materials: Provide stone that have been extracted, harvested, or recovered, as well as fabricated, within 500 miles of Project site.
- B. Varieties and Sources: Subject to compliance with requirements, provide one of the stone varieties specified for each stone type in Part 2 "Stone Types" Article.
- C. Match Architect's samples for variety, color, finish, and other stone characteristics relating to aesthetic effects.
- D. Provide stone that is free of cracks, seams, and starts impairing structural integrity or function.
- E. Provide stone from a single quarry for each variety of stone required.
- F. Quarry stone in a manner to ensure that as-quarried block orientations yield finished stone with required characteristics.
- G. Make stone slabs available for Architect to examine for appearance characteristics.
 - 1. Architect will select aesthetically acceptable slabs and will indicate aesthetically unacceptable slabs and portions of slabs.
 - 2. Segregate slabs selected for use on Project and mark backs indicating approval.
 - 3. Mark and photograph aesthetically unacceptable portions of slabs as directed by Architect.

2.2 STONE TYPES

- A. Granite: Provide granite complying with ASTM C 615 and NBGQA's "Specifications for Architectural Granite" and as follows:
 - 1. Varieties, Cut and Finish: As selected by Architect.

2.3 MORTAR MATERIALS

- A. Regional Materials: Provide aggregate for mortar and grout, cement, and lime that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
- B. Portland Cement: ASTM C 150, Type I or Type II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207.
 - For pigmented mortar, use a colored portland cement-lime mix of formulation required to produce color indicated or, if not indicated, as selected from manufacturer's standard formulations. Pigments shall not exceed 10 percent of portland cement by weight.
- E. Aggregate: ASTM C 144; except for joints narrower than 1/4 inch and pointing mortar, use aggregate graded with 100 percent passing No. 16 sieve.
 - 1. White Aggregates: Natural white sand or ground white stone.
 - 2. Colored Aggregates: Natural-colored sand or ground marble, granite, or other durable stone; of color necessary to produce required mortar color.
- F. Mortar Pigments: Natural and synthetic iron oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortar and containing no carbon black.
- G. Water: Potable.
- H. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Colored Portland Cement-Lime Mix:
 - a. Color Mortar Blend; Glen-Gery Corporation.
 - b. Rainbow Mortamix Custom Color Cement/Lime; Holcim, Inc.
 - c. Centurion Colorbond PL; Lafarge Corporation.
 - d. Lehigh Custom Color Portland/Lime; Lehigh Portland Cement Co.
 - e. Riverton Portland Cement Lime Custom Color; Essroc.

2. Mortar Pigments:

- a. Bayferrox Iron Oxide Pigments; LanXess
- b. True Tone Mortar Colors; Davis Colors.
- c. Centurion Pigments; Lafarge Corporation.
- d. SGS Mortar Colors; Solomon Grind-Chem Services, Inc.

2.4 ANCHORS AND BACKUP STRUCTURE

- A. Manufacturers of extruded aluminum channels having products considered acceptable for use; Precision Wall Systems, Inc. 10980 Alder Circle, Dallas, TX 75238 phone: (214) 774.4502 email: info@ gridworxwalls.com website: www.gridworxwalls.com
- B. Fabricate anchors, including shelf angles, from stainless steel, ASTM A 666, Type 316, temper as required to support loads imposed without exceeding allowable design stresses.
 - 1. Fasteners for Stainless-Steel Anchors: Annealed stainless-steel bolts, nuts, and washers; ASTM F 593 for bolts and ASTM F 594 for nuts, Alloy Group 2.
- C. Backup Structure: Fabricate components not in contact with stone from hot-rolled steel shapes complying with ASTM A 36/A 36M or from steel sheet not less than 0.1046 inch thick complying with ASTM A 570/A 570M. Hot-dip galvanize after fabrication to comply with ASTM A 123/A 123M. Fabricate components in contact with stone from same material specified for anchors.
- D. Cast-in-Place and Postinstalled Fasteners for Concrete and Masonry: Type indicated below, with capability to sustain, without failure, a load equal to 4 times the loads imposed, for concrete, or 6 times the load imposed, for masonry, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
 - 1. Adjustable Inserts Embedded in Concrete: Steel, cast iron, or malleable iron, with bolts, nuts, washers, and shims; all hot-dip galvanized or mechanically zinc coated.
 - 2. Postinstalled Fasteners for Concrete and Masonry: Chemical anchors made from stainless-steel components complying with ASTM F 593 and ASTM F 594, Alloy Group or 2 for bolts and nuts; ASTM A 666 or ASTM A 276, Type 316, for anchors.

2.5 STONE ACCESSORIES

- A. Setting Buttons: Lead or resilient plastic buttons, nonstaining to stone, sized to suit joint thicknesses and bed depths of stone units without intruding into required depths of joint sealants or causing third-side adhesion between sealant and setting button.
- B. Setting Shims: Strips of resilient plastic nonstaining to stone, sized to suit joint thicknesses and depths of stone supports without intruding into required depths of joint sealants or causing third-side adhesion between sealant and setting shims.

- C. Concealed Sheet Metal Flashing: Fabricate from stainless steel complying with requirements specified in Section 076200 SHEET METAL FLASHING AND TRIM in thicknesses indicated, but not less than 0.0156 inch thick.
 - 1. At Contractor's option, fabricate flashing from lead for installation in locations where flashing rests on continuous members.
- D. Dampproofing for Limestone: Provide cementitious formulations that are recommended by ILI and that are nonstaining to stone, compatible with joint sealants, and noncorrosive to anchors and attachments.
- E. Weep and Vent Tubes: Rectangular, cellular, polypropylene or clear butyrate extrusion, 3/8 by 1-1/2 inches and of length required to extend from exterior face of stone to cavity behind.
- F. Plastic Weep Hole/Vent: One-piece, flexible extrusion manufactured from ultravioletresistant polypropylene copolymer, designed to weep moisture in masonry cavity to exterior, in color selected from manufacturer's standard.

2.6 STONE FABRICATION

- A. General: Fabricate stone units in sizes and shapes required to comply with requirements indicated, including details on Drawings and Shop Drawings.
 - 1. For granite, comply with recommendations in NBGQA's "Specifications for Architectural Granite."
- B. Cut and drill sinkages and holes in stone for anchors, fasteners, supports, and lifting devices as indicated or needed to set stone securely in place; shape beds to fit supports.
- C. Cut stone to produce pieces of thickness, size, and shape indicated and to comply with fabrication and construction tolerances recommended by applicable stone association or, if none, by stone source, for faces, edges, beds, and backs.
 - 1. Minimum Thickness: Provide stone units of not less than dimensions indicated on the Drawings.
 - 2. Control depth of stone and back check to maintain minimum 1 inch clearance between backs of stone units and surfaces or projections of structural members, fireproofing (if any), backup walls, and other work behind stone.
 - 3. Dress joints (bed and vertical) straight and at right angle to face, unless otherwise indicated.
 - 4. Cut stone to produce joints of uniform width and in locations indicated.
 - 5. Clean backs of stone to remove rust stains, iron particles, and stone dust.
- D. Contiguous Work: Provide chases, reveals, reglets, openings, and similar features as required to accommodate contiguous work.

- E. Fabricate molded work, including washes and drips, to produce stone shapes with a uniform profile throughout entire unit length, with precisely formed arris slightly eased to prevent snipping, and with matching profile at joints between units.
 - 1. Produce moldings with machines having abrasive shaping wheels made to reverse contour of molding shape; do not sculpt moldings.
- F. Finish exposed faces and edges of stone, except sawed reveals, to comply with requirements indicated for finish and to match approved samples and mockups.
- G. Pattern Arrangement: Fabricate and arrange panels with veining and other natural markings to comply with the following requirements:
 - 1. Cut stone from one block or contiguous, matched blocks in which natural markings occur.
 - 2. Arrange panels with veining as indicated on Drawings.
- H. Carefully inspect finished stone units at fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units.
 - Grade and mark stone for overall uniform appearance when assembled in place. Natural variations in appearance are acceptable if installed stone units match range of colors and other appearance characteristics represented in approved samples and mockups.

2.7 FABRICATION OF BACKUP STRUCTURE

- A. General: Fabricate and assemble cold-formed metal framing to comply with requirements in Section 054000 COLD-FORMED METAL FRAMING.
- B. Weld shop connections to comply with applicable provisions of AWS D1.1, "Structural Welding Code--Steel."
- C. Fabricate joints to exclude water or to permit its escape to building exterior, at locations where water could accumulate because of condensation or other causes.
- D. For galvanized framing, clean welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

2.8 SHOP-PAINTED STEEL FINISHES

- A. General: Comply with SSPC-PA 1, "Paint Application Specification No. 1," for shop painting backup structure.
- B. Surface Preparation: After completing fabrication of steel items, prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- C. Apply 2-coat high-performance coating system consisting of organic zinc-rich primer, complying with SSPC-Paint 20, at 2.5-mil dry film thickness and topcoat of high-build, 2-component, epoxy-polyamide, high-performance coating at 6-mil dry film thickness.

- D. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. High-Performance Coating Systems:
 - a. Carboline 621 and 190 HB; Carboline Company.
 - b. Aquapon Zinc-Rich Primer 97-670 and High-Build Polyamide-Epoxy 97-131; PPG Industries, Inc.
 - c. Tneme-Zinc 90-97 and Series 69 Hi-Build Epoxoline II; Tnemec Company, Inc.

2.9 MORTAR MIXES

- A. General: Comply with referenced standards and with manufacturers' written instructions for mix proportions, mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures needed to produce mortar of uniform quality and with optimum performance characteristics.
 - 1. Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated. Do not use calcium chloride.
 - 2. Combine and thoroughly mix cementitious materials, water, and aggregates in a mechanical batch mixer, unless otherwise indicated. Discard mortar when it has reached initial set.
- B. Portland Cement-Lime Setting Mortar: Comply with ASTM C 270, Proportion Specification, for types of mortar indicated below:
 - 1. Set granite with Type S mortar.
 - 2. Set limestone with Type N mortar.
 - 3. Set marble with Type S mortar.
 - 4. Set quartz-based stone with Type S mortar.
 - 5. Set slate with Type S mortar.
- C. Pointing Mortar: Comply with ASTM C 270, Proportion Specification, Type N unless indicated otherwise. Provide pointing mortar mixed to match Architect's sample and complying with the following:
 - 1. Pigmented Pointing Mortar: Select and proportion pigments with other ingredients to produce color required. Do not exceed pigment-to-cement ratio of 1:10, by weight.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to receive dimension stone cladding and conditions under which dimension stone cladding will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of dimension stone cladding.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Advise installers of other work about specific requirements for placement of inserts, flashing reglets, and similar items to be used by dimension stone cladding Installer for anchoring, supporting, and flashing of dimension stone cladding system. Furnish installers of other work with Drawings or templates showing locations of these items.
- B. Protect dimension stone cladding during erection as follows:
 - 1. Cover tops of dimension stone cladding installation with nonstaining, waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress. Extend cover a minimum of 24 inches down both sides and hold securely in place.
 - 2. Prevent staining of stone from mortar, grout, sealants, and other sources. Immediately remove such materials without damaging stone.
 - 3. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surface.
 - 4. Protect sills, ledges, and projections from mortar and sealant droppings.
- C. Clean stone surfaces that are dirty or stained by removing soil, stains, and foreign materials before setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives.

3.3 SETTING DIMENSION STONE CLADDING, GENERAL

- A. Execute dimension stone cladding installation by skilled mechanics and employ skilled stone fitters at Project site to do necessary field cutting as stone is set.
 - 1. Use power saws with diamond blades to cut stone. Produce lines cut straight and true, with edges eased slightly to prevent snipping.
- B. Contiguous Work: Provide reveals, reglets, and openings as required to accommodate contiguous work.

- C. Set stone to comply with requirements indicated on Drawings and Shop Drawings. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure dimension stone cladding in place. Shim and adjust anchors, supports, and accessories to set stone accurately in locations indicated with uniform joints of widths indicated and with edges and faces aligned according to established relationships and indicated tolerances.
- D. Provide expansion, control, and pressure-relieving joints of widths and at locations indicated.
 - 1. Sealing expansion and other joints is specified in Section 079200 JOINT SEALANTS.
 - 2. Keep expansion joints free of mortar and other rigid materials.
- E. Install concealed flashing at continuous shelf angles, lintels, ledges, and similar obstructions to downward flow of water to divert water to building exterior.
- F. Keep cavities open where unfilled space is indicated between back of stone units and backup wall; do not fill cavities with mortar or grout.
 - 1. Coat limestone cladding with dampproofing to extent indicated below:
 - a. Stone at Grade: Beds, joints, and back surfaces to at least 12 inches above finish-grade elevations.
 - b. Stone Extending below Grade: Beds, joints, back surfaces, and face surfaces below grade.
 - c. Allow cementitious dampproofing formulations to cure before setting dampproofed stone. Do not damage or remove dampproofing while handling and setting stone.
 - 2. Place weep holes and vents in joints where moisture may accumulate, including base of cavity walls, above shelf angles, and flashing. Locate weep holes and vents at intervals not exceeding 24 inches and for those serving as vents only, at intervals not exceeding 60 inches horizontally and 20 feet vertically.

3.4 INSTALLATION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces of walls, do not exceed 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch in 40 feet or more. For external corners, corners and jambs within 20 feet of an entrance, expansion joints, and other conspicuous lines, do not exceed 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 3/8 inch in 40 feet or more.
- B. Variation from Level: For lintels, sills, water tables, parapets, horizontal bands, horizontal grooves, and other conspicuous lines, do not exceed 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 3/8 inch maximum.
- C. Variation of Linear Building Line: For positions shown in plan and related portions of walls and partitions, do not exceed 1/4 inch in 20 feet or 1/2 inch in 40 feet or more.

- D. Variation in Cross-Sectional Dimensions: For thickness of walls from dimensions indicated, do not exceed plus or minus 1/4 inch.
- E. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches or a quarter of nominal joint width, whichever is less.
- F. Variation in Plane between Adjacent Stone Units (Lipping): Do not exceed 1/16-inch difference between planes of adjacent units.

3.5 SETTING MECHANICALLY ANCHORED DIMENSION STONE CLADDING

- A. Attach anchors securely to stone and to backup surfaces. Comply with recommendations in ASTM C 1242.
- B. Attach framing for stone support system to structural frame of building, at connection points indicated, by welding or bolting to comply with the following:
 - 1. Weld connections to comply with AWS D1.1, "Structural Welding Code--Steel."
 - 2. Fabricate joints to exclude water or to permit its escape to building exterior, at locations where water could accumulate because of condensation or other causes.
 - 3. For galvanized surfaces, clean welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.
 - 4. For shop-painted surfaces, clean field welds, bolted connections, and abraded areas immediately after erection. Apply paint to exposed areas using same material as used for shop painting.
- C. Fill anchor holes with sealant.
 - 1. Where dowel holes occur at pressure-relieving joints, provide compressible material at ends of dowels.
- D. Set stone supported on clip or continuous angles on resilient setting shims. Use material of thickness required to maintain uniform joint widths. Hold shims back from face of stone a distance at least equal to width of joint.

3.6 SETTING DIMENSION STONE CLADDING WITH MORTAR

- A. Set stone in full bed of mortar with head joints slushed full, unless otherwise indicated.
 - 1. Use setting buttons of adequate size, in sufficient quantity, and of thickness required to maintain uniform joint width and to prevent mortar from extruding. Hold buttons back from face of stone a distance at least equal to width of joint.
 - 2. Do not set heavy units or projecting courses until mortar in courses below has hardened enough to resist being squeezed out of joint.
 - 3. Support and brace projecting stones until wall above is in place and mortar has set.

- 4. Provide compressible filler in ends of dowel holes and bottoms of kerfs to prevent end bearing of dowels and anchor tabs on stone. Fill remainder of anchor holes with mortar.
- B. Embed ends of sills in mortar; leave remainder of joint open until final pointing.
- C. Rake out joints for pointing with mortar to depths of not less than 1/2 inch. Rake joints to uniform depths with square bottoms and clean sides.
- D. Prepare stone-joint surfaces for pointing with mortar by removing dust and mortar particles. Where setting mortar was removed to depths greater than surrounding areas, apply first layer of pointing mortar in layers not more than 3/8 inch until a uniform depth is formed; compact each layer thoroughly and allow to become thumbprint hard before applying next layer.
- E. Point stone joints by placing and compacting pointing mortar in layers not more than 3/8 inch.
- F. Tool joints with a round jointer having a diameter 1/8 inch larger than width of joint, when pointing mortar is thumbprint hard.

3.7 FIELD QUALITY CONTROL

- A. Field Quality-Control Testing Service: Owner will engage a qualified independent testing agency to perform field quality-control testing. Retesting of materials that fail to meet specified requirements shall be done at Contractor's expense.
- B. Water Leakage: Dimension stone cladding system will be tested according to AAMA 501.2.
- C. Testing agency will report test results promptly and in writing to Architect and Contractor.

3.8 ADJUSTING AND CLEANING

- A. Remove and replace broken, chipped, stained, or otherwise damaged stone, defective joints, and dimension stone cladding that does not match approved samples and mockups. Damaged stone may be repaired if Architect approves methods and results.
- B. Replace in a manner that results in dimension stone cladding's matching approved samples and mockups, complying with other requirements, and showing no evidence of replacement.
- C. In-Progress Cleaning: Clean dimension stone cladding as work progresses. Remove mortar fins and smears before tooling joints.
- D. Clean dimension stone cladding no fewer than six days after completion of pointing and sealing, using clean water and stiff-bristle fiber brushes. Do not use wire brushes,

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acid-type cleaning agents, cleaning agents containing caustic compounds or abrasives, or other materials or methods that could damage stone.

END OF SECTION

SECTION 051200 - STRUCTUAL STEEL FRAMING

PART 1 – GENERAL

1.1 SUMMARY

- Section Includes: Α.
 - 1. Structural steel.
 - 2. Shrinkage-resistant grout.

1.2 **DEFINITIONS**

Structural Steel: Elements of the structural frame indicated on Drawings and as Α. described in ANSI/AISC 303.

1.3 PREINSTALLATION MEETINGS

Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- Α. Product Data:
 - Structural-steel materials. 1.
 - 2. High-strength, bolt-nut-washer assemblies.
 - Anchor rods. 3.
 - Threaded rods. 4.
 - Shop primer. 5.
 - Galvanized-steel primer. 6.
 - Etching cleaner. 7.
 - Galvanized repair paint. 8.
 - Shrinkage-resistant grout.
- B. Shop Drawings: Show fabrication of structural-steel components.
- C. Delegated-Design Submittal: For structural-steel connections indicated on Drawings to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- Welding certificates. Α.
- Mill test reports for structural-steel materials, including chemical and physical B. properties.
- C. Source quality-control reports.
- D. Field quality-control reports.

QUALITY ASSURANCE 1.6

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU or is accredited by the IAS Fabricator Inspection Program for Structural Steel (Acceptance Criteria 172).
- Welding Qualifications: Qualify procedures and personnel in accordance with B. AWS D1.1/D1.1M.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with applicable provisions of the following specifications and documents:
 - 1. ANSI/AISC 303.
 - 2. ANSI/AISC 360.
 - 3. RCSC's "Specification for Structural Joints Using High-Strength Bolts."
- B. Connection Design Information:
 - 1. Fabricator's experienced steel detailer shall select or complete connections in accordance with ANSI/AISC 303.
 - Select and complete connections using schematic details indicated and AISC 360.
- C. Moment Connections: Type FR, fully restrained.
- D. Construction: Moment frame.

2.2 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A992/A992M.
- B. Channels, Angles, M-Shapes, S-Shapes: ASTM A36/A36M.
- C. Plate and Bar: ASTM A36/A36M.
- D. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade B structural tubing.
- E. Steel Pipe: ASTM A53/A53M, Type E or Type S, Grade B.
- F. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS AND CONNECTORS

- A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbonsteel washers; all with plain finish.
 - 1. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with plain finish.
- B. High-Strength A490 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A490, Type 1, heavy-hex steel structural bolts or Grade F2280 tension-control, bolt-nut-washer assemblies with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
 - 1. Direct-Tension Indicators: ASTM F959/F959M, Type 490-1, compressible-washer type with plain finish.
- C. Zinc-Coated High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.
 - 1. Finish: Hot-dip or mechanically deposited zinc coating.
 - 2. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with mechanically deposited zinc coating, baked epoxy-coated finish.
- D. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F3125/F3125M, Grade F1852, Type 1, heavy-hex head assemblies, consisting of steel structural bolts with splined ends; ASTM A563, Grade DH,

heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbonsteel washers.

- 1. Finish: Mechanically deposited zinc coating.
- Shear Stud Connectors: ASTM A108, AISI C-1015 through C-1020, headed-stud E. type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

2.4 **RODS**

- Unheaded Anchor Rods: ASTM F1554, Grade 36. Α.
 - Configuration: Hooked. 1.
 - 2. Finish: Hot-dip zinc coating, ASTM A153/A153M, Class C.
- Headed Anchor Rods: ASTM F1554, Grade 36, straight. B.
 - Finish: Hot-dip zinc coating, ASTM A153/A153M, Class C.
- Threaded Rods: ASTM A36/A36M. C.
 - Finish: Hot-dip zinc coating, ASTM A153/A153M, Class C.

2.5 FORGED-STEEL STRUCTURAL HARDWARE

Clevises and Turnbuckles: Made from cold-finished carbon-steel bars, ASTM A108. AISI C-1035.

2.6 PRIMER

- Steel Primer: Α.
 - Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

2.7 SHRINKAGE-RESISTANT GROUT

Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, Α. nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.8 **FABRICATION**

- Structural Steel: Fabricate and assemble in shop to greatest extent possible. Α. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.
- B. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using automatic end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions.

2.9 SHOP CONNECTIONS

- High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's Α. "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.
 - Joint Type: Snug tightened.
- В. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

2.10 **GALVANIZING**

Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural Α. steel in accordance with ASTM A123/A123M.

1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.

2.11 SHOP PRIMING

- A. Shop prime steel surfaces, except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
 - 2. Surfaces to be field welded.
 - 3. Surfaces of high-strength bolted, slip-critical connections.
 - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 - 5. Galvanized surfaces unless indicated to be painted.
 - 6. Surfaces enclosed in interior construction.
- B. Surface Preparation of Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces in accordance with the following specifications and standards. Coordinate minimum surface-preparation requirements with selection of primers, paint, and coating systems:
 - 1. SSPC-SP 2.
 - 2. SSPC-SP 3.
 - 3. SSPC-SP 7 (WAB)/NACE WAB-4.
 - 4. SSPC-SP 6 (WAB)/NACE WAB-3.
- C. Surface Preparation of Galvanized Steel: If galvanized steel is indicated to be painted, prepare galvanized-steel surfaces for shop priming by thoroughly cleaning steel of grease, dirt, oil, flux, and other foreign matter, and treating with etching cleaner or in accordance with SSPC-SP 16.
- D. Priming: Immediately after surface preparation, apply primer in accordance with manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonrybearing surfaces and locations of anchor rods, bearing plates, and other embedded items for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.
- B. Baseplates, Bearing Plates, and Leveling Plates: Clean concrete- and masonrybearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Weld plate washers to top of baseplate.

- 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
- 4. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for grouting.
- C. Maintain erection tolerances of structural steel within ANSI/AISC 303.

3.3 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.
 - 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.

3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform the following special inspections:
 - 1. Verify structural-steel materials and inspect steel frame joint details.
 - 2. Verify weld materials and inspect welds.
 - 3. Verify connection materials and inspect high-strength bolted connections.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
 - 1. Bolted Connections: Inspect and test bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
 - 2. Welded Connections: Visually inspect field welds in accordance with AWS D1.1/D1.1M.
 - a. In addition to visual inspection, test and inspect field welds in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - 1) Liquid Penetrant Inspection: ASTM E165/E165M.
 - 2) Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - 3) Ultrasonic Inspection: ASTM E164.
 - 4) Radiographic Inspection: ASTM E94/E94M.

END OF SECTION 051200

SECTION 052100 - STEEL JOIST FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. K-series steel joists.
 - 2. K-series steel joist substitutes.
 - 3. LH-series long-span steel joists.
 - 4. DLH-series long-span steel joists.
 - 5. Steel joist girders.
 - 6. Steel joist accessories.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of joist, accessory, and product.
- B. Shop Drawings:
 - 1. Include layout, designation, number, type, location, and spacing of joists.
 - 2. Include joining and anchorage details; bracing, bridging, and joist accessories; splice and connection locations and details; and attachments to other construction.

1.3 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Manufacturer certificates.
- C. Mill Certificates: For each type of bolt.
- D. Field quality-control reports.

1.4 QUALITY ASSURANCE

- Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables in SJI's "Specifications."
 - 1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.
- B. Welding Qualifications: Qualify field-welding procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code Steel."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. <u>Manufacturers:</u> 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. Canam Steel Corporation; Canam Group, Inc.
 - 2. New Millennium Building Systems, LLC.
 - 3. Vulcraft; Nucor Vulcraft Group.

2.2 STEEL JOISTS

- A. K-Series Steel Joist: Manufactured steel joists of type indicated according to "Standard Specification for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.
 - 1. Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.
- B. Long-Span Steel Joist: Manufactured steel joists according to "Standard Specification for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members; of joist type and end and top-chord arrangements as indicated on Drawings.

2.3 STEEL JOIST GIRDERS

A. Manufactured joist girders according to "Standard Specification for Joist Girders" in SJI's "Specifications," with steel-angle top- and bottom-chord members; with end and top-chord arrangements as indicated.

2.4 PRIMERS

- A. Primer:
 - 1. SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

2.5 STEEL JOIST ACCESSORIES

- A. Bridaina:
 - 1. Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.
- B. Furnish ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction.
 - 1. Extend ends to within 1/2 inch of finished wall surface unless otherwise indicated on Drawings.
- C. High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.
 - 1. Finish:
 - a. Interior: Plain
 - Exterior: Hot-dip zinc coating, ASTM A153/A153M, Class C
- D. Furnish miscellaneous accessories including splice plates and bolts required by joist manufacturer to complete joist assembly.

2.6 CLEANING AND SHOP PAINTING

- A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories.
- B. Apply one coat of shop primer to joists and joist accessories.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Do not install joists until supporting construction is in place and secured.
- B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written instructions, and requirements in this Section.
 - 1. Before installation, splice joists delivered to Project site in more than one piece.
 - 2. Space, adjust, and align joists accurately in location before permanently fastening.
 - 3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
- C. Field weld joists to supporting steel bearing plates and framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
- D. Bolt joists to supporting steel framework using carbon-steel bolts.
- E. Bolt joists to supporting steel framework using high-strength structural bolts. Comply with RCSC's "Specification for Structural Joints Using ASTM A325 or ASTM A490 Bolts" for high-strength structural bolt installation and tightening requirements.
- F. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.2 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Visually inspect field welds according to AWS D1.1/D1.1M.
- C. Visually inspect bolted connections.
- D. Prepare test and inspection reports.

END OF SECTION 052100

SECTION 053100 - STEEL DECKING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Roof deck.

1.2 ACTION SUBMITTALS

- A. Product Data: For the following:
 - Roof deck.
- B. Shop Drawings:
- C. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.3 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Product Certificates: For each type of steel deck.
- C. Research reports.
- D. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

2.2 ROOF DECK

- A. <u>Manufacturers:</u> 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. <u>Canam Steel Corporation; Canam Group, Inc.</u>
 - 2. New Millennium Building Systems, LLC.
 - 3. <u>Nucor Corp</u>.
- B. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
 - 1. Prime-Painted Steel Sheet: ASTM A1008/A1008M, Structural Steel (SS), Grade 33 minimum, shop primed with manufacturer's standard baked-on, rust-inhibitive primer.
 - Color: Manufacturer's standard.
 - 2. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), G90 zinc coating.

- 3. Galvanized and Shop-Primed Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 33, G60 zinc coating; cleaned, pretreated, and primed with manufacturer's standard baked-on, rust-inhibitive primer.
 - a. Color: Manufacturer's standard.
- 4. Deck Profile: B (WR).
- 5. Profile Depth: 1½".
- 6. Design Uncoated-Steel Thickness: 0.0474 inch minimum, or as indicated.

2.3 ACCESSORIES

- A. Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.
- G. Galvanizing Repair Paint: SSPC-Paint 20 or MIL-P-21035B, with dry film containing a minimum of 94 percent zinc dust by weight.
- H. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.
- B. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- C. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- D. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- E. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- F. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.
- G. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and weld flanges to top of deck. Space welds not more than 12 inches apart with at least one weld at each corner.

- 1. Install reinforcing channels or zees in ribs to span between supports and weld or mechanically fasten.
- H. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.
 - 1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.
- I. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations unless otherwise indicated.
- J. Floor-Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

3.2 REPAIR

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.
- B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repair paint.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Field welds will be subject to inspection.
- C. Prepare test and inspection reports.

END OF SECTION 053100

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Load-bearing wall framing.
 - 2. Exterior non-load-bearing wall framing.
 - 3. Interior non-load-bearing wall framing.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Cold-formed steel framing materials.
 - 2. Load-bearing wall framing.
 - 3. Exterior non-load-bearing wall framing.
 - 4. Interior non-load-bearing wall framing.
 - 5. Vertical deflection clips.
 - 6. Single deflection track.
 - 7. Double deflection track.
 - 8. Drift clips.
 - 9. Post-installed anchors.
 - Power-actuated anchors.

B. Shop Drawings:

- 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
- 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

1.4 INFORMATIONAL SUBMITTALS

- 1. Welding certificates.
- 2. Product certificates.
- 3. Product test reports.
- 4. Research Reports:
 - For post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E329 for testing indicated.
- B. Product Tests: Mill certificates or data from a qualified independent testing agency.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
 - AWS D1.1/D1.1M, "Structural Welding Code Steel."

- 2. AWS D1.3/D1.3M, "Structural Welding Code Sheet Steel."
- D. Comply with AISI S230 "Standard for Cold-Formed Steel Framing Prescriptive Method for One and Two Family Dwellings."

PART 2 - PRODUCTS

3.1 MANUFACTURERS

- A. <u>Manufacturers:</u> 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. ClarkDietrich.
 - 2. MarinoWARE.
 - 3. MBA Building Supplies.

3.2 PERFORMANCE REQUIREMENTS

- A. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing shall comply with AISI S100, AISI S200, and the following:
 - 1. Wall Studs: AISI S211.
 - 2. Headers: AISI S212.
 - 3. Lateral Design: AISI S213.
- B. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

3.3 COLD-FORMED STEEL FRAMING MATERIALS

- A. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
 - 1. Grade: As required by structural performance.
 - 2. Coating: G60, A60, AZ50, or GF30.
- B. Steel Sheet for Vertical Deflection Clips: ASTM A653/A653M, structural steel, zinc coated, of grade and coating as follows:
 - 1. Grade: As required by structural performance.
 - 2. Coating: G60.

3.4 LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0329 inch.
 - 2. Flange Width: 1-5/8 inches.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with straight flanges, and matching minimum base-metal thickness of steel studs.
- C. Steel Box or Back-to-Back Headers: Manufacturer's standard C-shapes used to form header beams, of web depths indicated, unpunched, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0329 inch.
- D. Flange Width: 1-5/8 inches.

3.5 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0329 inch.
 - 2. Flange Width: 1-5/8 inches.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and matching minimum base-metal thickness of steel studs.
- C. Vertical Deflection Clips: Manufacturer's standard clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. ClarkDietrich.
 - b. MarinoWARE.
 - c. <u>Simpson Strong-Tie Co., Inc.</u>
- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure.
- E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
- F. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

3.6 INTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0329 inch.
 - 2. Flange Width: 1-5/8 inches.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and matching minimum base-metal thickness of steel studs.
- C. Vertical Deflection Clips: Manufacturer's standard clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
 - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
 - a. ClarkDietrich.
 - b. MarinoWARE.
 - c. Simpson Strong-Tie Co., Inc.
- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure.
- E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.

F. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

3.7 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated.

3.8 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process according to ASTM A123/A123M.
- B. Anchor Bolts: ASTM F1554, Grade 36, threaded carbon-steel carbon-steel nuts, and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A153/A153M, Class C.
- C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC193, ICC-ES AC58, or ICC-ES AC308 as appropriate for the substrate.
 - 1. Uses: Securing cold-formed steel framing to structure.
 - 2. Type: Torque-controlled expansion anchor or adhesive anchor.
 - 3. Alloy Group 1 (A1) refers to Type 304 and similar alloys, and Alloy Group 2 (A4) refers to Type 316 and similar alloys.
 - 4. Material for Exterior or Interior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F593, and nuts, ASTM F594.
- D. Power-Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- E. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
 - 1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.

3.9 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A780/A780M or SSPC-Paint 20.
- B. Cement Grout: Portland cement, ASTM C150/C150M, Type I; and clean, natural sand, ASTM C404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- C. Nonmetallic, Nonshrink Grout: Factory-packaged, nonmetallic, noncorrosive, nonstaining grout, complying with ASTM C1107/C1107M, and with a fluid consistency and 30-minute working time.
- D. Shims: Load-bearing, high-density, multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as framing members supported by shims.

E. Sill Sealer Gasket: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members as required.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.
- B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that required to obtain fire-resistance ratings indicated. Protect remaining fire-resistive materials from damage.
- C. Install load-bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch to ensure a uniform bearing surface on supporting concrete or masonry construction.
- D. Install sill sealer gasket at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.2 INSTALLATION, GENERAL

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
- D. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- E. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- F. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- G. Install insulation, specified in Section 072100 "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- H. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

3.3 INSTALLATION OF LOAD-BEARING WALL FRAMING

- A. Install continuous top and bottom tracks sized to match studs. Align tracks accurately and securely anchor at corners and ends, and at spacings as follows:
 - 1. Anchor Spacing: As shown on Shop Drawings.

- B. Squarely seat studs against top and bottom tracks, with gap not exceeding 1/8 inch between the end of wall-framing member and the web of track.
 - 1. Fasten both flanges of studs to top and bottom tracks.
 - 2. Space studs as follows:
 - a. Stud Spacing: As indicated on Drawings.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar configurations.
- D. Align studs vertically where floor framing interrupts wall-framing continuity. Where studs cannot be aligned, continuously reinforce track to transfer loads.
- E. Align floor and roof framing over studs according to AISI S200, Section C1. Where framing cannot be aligned, continuously reinforce track to transfer loads.
- F. Anchor studs abutting structural columns or walls, including masonry walls, to supporting structure.
- G. Install headers over wall openings wider than stud spacing. Locate headers above openings. Fabricate headers of compound shapes indicated or required to transfer load to supporting studs, complete with clip-angle connectors, web stiffeners, or gusset plates.
 - 1. Frame wall openings with not less than a double stud at each jamb of frame. Fasten jamb members together to uniformly distribute loads.
 - 2. Install tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with clip angles or by welding, and space jack studs same as full-height wall studs.
- H. Install supplementary framing, blocking, and bracing in stud framing indicated to support fixtures, equipment, services, casework, heavy trim, furnishings, and similar work requiring attachment to framing.
 - 1. If type of supplementary support is not indicated, comply with stud manufacturer's written recommendations and industry standards in each case, considering weight or load resulting from item supported.
- I. Install horizontal bridging in stud system, spaced vertically as indicated on Shop Drawings Insert dimension. Fasten at each stud intersection.
 - 1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs with a minimum of two screws into each flange of the clip angle for framing members up to 6 inches deep.
 - 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges, and secure solid blocking to stud webs or flanges.
 - 3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- J. Install steel sheet diagonal bracing straps to both stud flanges; terminate at and fasten to reinforced top and bottom tracks. Fasten clip-angle connectors to multiple studs at ends of bracing and anchor to structure.
- K. Install miscellaneous framing and connections, including supplementary framing, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.4 INSTALLATION OF EXTERIOR NON-LOAD-BEARING WALL FRAMING

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.

- B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
 - 1. Stud Spacing: As indicated on Drawings.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 - 1. Install single deep-leg deflection tracks and anchor to building structure.
 - 2. Install double deep-leg deflection tracks and anchor outer track to building structure.
 - 3. Connect vertical deflection clips to stude and anchor to building structure.
 - 4. Connect drift clips to cold-formed steel framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.
 - 1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
 - 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 - 3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.5 INSTALLATION OF INTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.
- B. Fasten both flanges of studs to bottom track unless otherwise indicated. Space studs as follows:
 - 1. Stud Spacing: As indicated on Drawings.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 - 1. Install single deep-leg deflection tracks and anchor to building structure.
 - 2. Install double deep-leg deflection tracks and anchor outer track to building structure.
 - 3. Connect vertical deflection clips to stude and anchor to building structure.
 - 4. Connect drift clips to cold-formed steel metal framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.
 - 1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
 - 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to

- match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
- 3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.6 INSTALLATION TOLERANCES

- A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
 - 1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.7 REPAIRS

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.

3.8 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Cold-formed steel framing will be considered defective if it does not pass tests and inspections.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

END OF SECTION 054000

SECTION 055000 - METAL FABRICATIONS

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Miscellaneous steel framing and supports.
 - Metal ladders.
 - 3. Ladder safety cages.
 - 4. Metal floor plate and supports.
 - 5. Elevator pit sump covers.
 - 6. Structural-steel door frames.
 - 7. Miscellaneous steel trim.
 - 8. Metal bollards.
 - 9. Pipe Downspout guards.
 - 10. Loose bearing and leveling plates.
- B. Products furnished, but not installed, under this Section include the following:
 - 1. Loose steel lintels.
 - 2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
 - 3. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

1.2 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Paint products.
 - 2. Grout.
- B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
- C. Delegated-Design Submittal: For ladders, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance of Aluminum Ladders: Aluminum ladders, including landings, shall withstand the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work,

provide materials without seam marks, roller marks, rolled trade names, or blemishes.

- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Stainless-Steel Bars and Shapes: ASTM A276, Type 304.
- D. Rolled-Steel Floor Plate: ASTM A786/A786M, rolled from plate complying with ASTM A36/A36M or ASTM A283/A283M, Grade C or D.
- E. Rolled-Stainless-Steel Floor Plate: ASTM A793.
- F. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- G. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.
- H. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
 - 1. Size of Channels: 1-5/8 by 1-5/8 inches, or as indicated on the plans.
 - 2. Material: Galvanized steel, ASTM A653/A653M, structural steel, Grade 33, with G90 coating; 0.079-inch nominal thickness.
 - 3. Material: Cold-rolled steel, ASTM A1008/A1008M, structural steel, Grade 33; 0.0677-inch minimum thickness; coated with rust-inhibitive, baked-on, acrylic enamel, or hot-dip galvanized after fabrication.
- I. Cast Iron: Either gray iron, ASTM A48/A48M, or malleable iron, ASTM A47/A47M, unless otherwise indicated.
- J. Aluminum Extrusions: ASTM B221, Alloy 6063-T6.
- K. Aluminum-Alloy Rolled Tread Plate: ASTM B632/B632M, Alloy 6061-T6.
- L. Aluminum Castings: ASTM B26/B26M, Alloy 443.0-F.
- M. Bronze Extrusions: ASTM B455, Alloy UNS No. C38500 (extruded architectural bronze).
- N. Bronze Castings: ASTM B584, Alloy UNS No. C83600 (leaded red brass) or No. C84400 (leaded semired brass).
- O. Nickel Silver Castings: ASTM B584, Alloy UNS No. C97600 (20 percent leaded nickel bronze).

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
 - 1. Provide stainless-steel fasteners for fastening aluminum.
 - 2. Provide stainless-steel fasteners for fastening stainless steel.
 - 3. Provide stainless-steel fasteners for fastening nickel silver.
 - 4. Provide bronze fasteners for fastening bronze.
- B. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F2329.
- C. Post-Installed Anchors: Torque-controlled expansion anchors or epoxy anchors.
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.

2.4 MISCELLANEOUS MATERIALS

- A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 - 1. Use primer containing pigments that make it easily distinguishable from zincrich primer.
- B. Water-Based Primer for use with High-Performance Coatings: Emulsion type, anticorrosive primer for mildly corrosive environments that is resistant to flash rusting when applied to cleaned steel, complying with MPI#107 and compatible with topcoat.
- C. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- F. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- G. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi.

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
- C. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended.
- D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.
- E. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- F. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors not less than 8 inches from ends and corners of units and 24 inches o.c.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

2.7 SHELF ANGLES

- A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch bolts, spaced not more than 6 inches from ends and 24 inches o.c., unless otherwise indicated.
- B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.
- C. Galvanize and prime shelf angles located in exterior walls.
- D. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.8 STRUCTURAL-STEEL DOOR FRAMES

- A. Fabricate structural-steel door frames from steel shapes, plates, and bars of size and to dimensions indicated, fully welded together, with 5/8-by-1-1/2-inch steel channel stops. Plug-weld built-up members and continuously weld exposed joints. Reinforce frames and drill and tap as necessary to accept finish hardware.
 - 1. Provide with integrally welded steel strap anchors for securing door frames into adjoining concrete or masonry.
- B. Galvanize exterior steel frames.
- C. Prime steel frames with primer specified in Section 099600 "High-Performance Coatings."

2.9 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
- C. Galvanize exterior miscellaneous steel trim.

2.10 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

2.11 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.
- B. Galvanize loose steel lintels located in exterior walls.

2.12 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.13 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

2.14 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.
- B. Shop prime iron and steel items unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
- C. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
 - 1. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2. Other Items: SSPC-SP 3, "Power Tool Cleaning."
- D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 INSTALLING METAL BOLLARDS

- A. Fill metal-capped bollards solidly with concrete and allow concrete to cure seven days before installing, unless otherwise indicated.
- B. Anchor bollards in concrete with pipe sleeves preset and anchored into concrete. Fill annular space around bollard solidly with nonshrink grout.
- C. Anchor bollards in place with concrete footings. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.
- D. Fill bollards solidly with concrete, mounding top surface to shed water.

3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shoppainted surfaces.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION 055000

SECTION 055150 - METAL RAILINGS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Steel railings, handrails and guardrails new and modifications to existing.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - Section 033000 CAST-IN-PLACE CONCRETE for sleeves, anchors, inserts, plates and similar items.
 - 2. Section 042000 UNIT MASONRY for miscellaneous metal and iron sleeves, anchors, inserts and plates to be built into masonry walls.
 - 3. Section 055000 METAL FABRICATIONS for metal treads and nosings not installed in metal stairs.
 - 4. Section 057300 DECORATIVE METAL RAILINGS for aluminum railings.
 - 5. Section 061000 ROUGH CARPENTRY for wood blocking for anchoring railings.
 - 6. Section 092110 GYPSUM BOARD ASSEMBLIES for metal backing for anchoring railings.
 - 7. Section 099000 PAINTING AND COATING for field painting work of this section.

1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design stairs and railings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance of Railings: Provide railings capable of withstanding the effects of gravity loads and Code required loads and stresses within limits and under conditions indicated.

1.4 SUBMITTALS

- A. Product Data: For each product.
 - 1. Manufacturer's product lines of railings assembled from standard components.
 - 2. Grout, anchoring cement, and paint products.

- B. FGBC Submittals: In accordance with the Owner's Certification Requirements...
- C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Provide templates for anchors and bolts specified for installation under other Sections.
 - 2. Shop drawings shall be signed and sealed by a professional engineer currently licensed in the project location.
- D. Delegated-Design Submittal: For railings indicated to comply with performance requirements and design criteria, including structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- E. Welding certificates.
- F. Qualification Data: For professional engineer.

1.5 QUALITY ASSURANCE

- A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of metal stairs and railings that are similar to those indicated for this Project in material, design, and extent.
- C. Installer Qualifications: Fabricator of products.
- D. Welding: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1, "Structural Welding Code--Steel."
 - 2. AWS D1.3, "Structural Welding Code--Sheet Steel."

1.6 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for metal handrails. 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.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Recycled Content of Steel Products: Provide products with average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.

2.2 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Tubing: ASTM A 500 (cold formed) or ASTM A 513, Type 5 (mandrel drawn).

2.3 FASTENERS

A. General: Provide zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 25 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.

2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Shop Primers: Provide primers that comply with Section 099000 PAINTING AND COATING.
- C. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.
 - 1. Provide interior, field-applied primer with a VOC content of 250 g/L or less.
- D. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.
 - 1. Provide interior, field-applied primer with a VOC content of 250 g/L or less.
- E. Isolation Coating (Bituminous Paint): ASTM D 1187, cold-applied asphalt emulsion, VOC compliant, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- F. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

- 1. Available Products: Sika; SikaGrout 212, or approved equal.
- 2. VOC Content: 0 g/L.
- G. Concrete Materials and Properties: Comply with requirements in Section 033000 CAST-IN-PLACE CONCRETE for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi, unless otherwise indicated.

2.5 FABRICATION, GENERAL

- A. Provide complete handrail assemblies, including metal railings, clips, brackets, bearing plates, and other components necessary to support and anchor handrails on supporting structure.
 - 1. Join components by welding, unless otherwise indicated.
 - 2. Use connections that maintain structural value of joined pieces.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work true to line and level with accurate angles and surfaces and straight edges.
- E. Weld connections to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Weld exposed corners and seams continuously, unless otherwise indicated.
 - 5. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flathead (countersunk) screws or bolts unless otherwise indicated. Locate joints where least conspicuous.
- G. Comply with "Guideline 1: Joint Finishes", by National Ornamental & Miscellaneous Metals Association (NOMMA), as follows:
 - 1. Typical Railing: Type 2 or better, unless otherwise indicated.
 - 2. Service Stair Railing: Type 3 or better, unless otherwise indicated.
 - 3. Ornamental Railing: Type 1.
- H. Fabricate joints that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

2.6 STEEL RAILINGS

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.
- B. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
- C. Form changes in direction of railings as detailed on the Drawings.
- D. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- E. Close exposed ends of railing members with prefabricated end fittings.
- F. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
 - 1. Connect posts to stair framing by direct welding, unless otherwise indicated.
 - 2. For galvanized railings, provide galvanized fittings, brackets, fasteners, sleeves, and other ferrous-metal components.
 - 3. For nongalvanized railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction.
- H. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

2.7 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal stairs after assembly.

2.8 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

- 1. ASTM A 123/A 123M, for galvanizing steel and iron products.
- 2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.
- 3. Fill vent and drain holes that will be exposed in finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.
- 4. Handrails: Galvanizing shall exhibit a rugosity (smoothness) not greater than 4 rug (16-20 microns of variation) when measured by a profilometer over a 1 inch straight line on the surface of the railings.
- B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed products:
 - 1. At Exterior Stairs (SSPC Zone 1B): SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2. At Interior Stairs (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."
- C. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- E. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

3.2 INSTALLING STEEL RAILINGS

- A. Adjust railing systems before anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as required by design loads. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:
 - 1. Anchor handrail ends to concrete and masonry with steel round flanges welded to rail ends and anchored with postinstalled anchors and bolts.
- B. Attach handrails to wall with wall brackets. Provide bracket with 1-1/2-inch clearance from inside face of handrail and finished wall surface. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads. Secure wall brackets to building construction as follows:
 - 1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
 - 2. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
 - 3. For hollow masonry anchorage, use toggle bolts.
 - 4. For steel-framed gypsum board assemblies, fasten brackets directly to steel framing or concealed steel reinforcements using self-tapping screws of size and type required to support structural loads.

3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION

SECTION 055300 - METAL GRATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Metal bar gratings at pits.
 - 2. Metal frames and supports for gratings.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 051200 STRUCTURAL STEEL FRAMING for structural-steel framing system components.

1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design gratings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Gratings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.
 - 1. Floors: Uniform load of 250 lbf/sq. ft. or concentrated load of 3000 lbf, whichever produces the greater stress.
 - 2. Sidewalks and Vehicular Driveways, Subject to Trucking: Uniform load of 250 lbf/sq. ft. or concentrated load of 8000 lbf, whichever produces the greater stress.
 - 3. Limit deflection to L/360 or 1/4 inch, whichever is less.
- C. Seismic Performance: Provide gratings capable of withstanding the effects of earthquake motions determined according to ASCE/SEI 7.

1.4 SUBMITTALS

- A. Product Data: For each product.
 - 1. Including clips and anchorage devices for gratings.
 - 2. Paint products.

- B. Shop Drawings: Include plans, sections, details, and attachments to other work.
- C. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Qualification Data: For qualified professional engineer.
- E. Mill Certificates: Signed by manufacturers of stainless-steel sheet certifying that products furnished comply with requirements.
- F. Welding certificates.
- G. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

1.5 QUALITY ASSURANCE

- A. Metal Bar Grating Standards: Comply with NAAMM MBG 531, "Metal Bar Grating Manual" and NAAMM MBG 532, "Heavy-Duty Metal Bar Grating Manual."
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code Steel."
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code Steel."
 - 2. AWS D1.3, "Structural Welding Code Sheet Steel."

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with gratings by field measurements before fabrication.

1.7 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for gratings, grating frames, and supports. 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.

PART 2 - PRODUCTS

2.1 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Bars for Bar Gratings: ASTM A 36/A 36M or steel strip, ASTM A 1011/A 1011M or ASTM A 1018/A 1018M.
- C. Wire Rod for Bar Grating Crossbars: ASTM A 510.
- D. Uncoated Steel Sheet: ASTM A 1011/A 1011M, structural steel, Grade 30.
- E. Galvanized-Steel Sheet: ASTM A 653/A 653M, structural quality, Grade 33, with G90 coating.
- F. Expanded-Metal Carbon Steel: ASTM F 1267, Class 1.
- G. Expanded-Metal Galvanized Steel: ASTM F 1267, Class 2, Grade A.

2.2 FASTENERS

- A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
 - 1. Provide stainless-steel fasteners for fastening aluminum.
 - 2. Provide stainless steel fasteners for fastening stainless steel.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.
- C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
 - 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- D. Plain Washers: Round, ASME B18.22.1.
- E. Lock Washers: Helical, spring type, ASME B18.21.1.
- F. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.

2.3 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy that is welded.
- B. Shop Primers: Provide primers that comply with Section 099000 PAINTING AND COATING.
- C. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.
 - 1. Provide interior, field-applied primer with a VOC content of 250 g/L or less.
- D. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.
 - 1. Provide interior, field-applied primer with a VOC content of 250 g/L or less.
- E. Isolation Coating (Bituminous Paint): ASTM D 1187, cold-applied asphalt emulsion, VOC compliant, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.4 FABRICATION

- A. Shop Assembly: Fabricate grating sections in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch material cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form from materials of size, thickness, and shapes indicated, but not less than that needed to support indicated loads.
- D. Fit exposed connections accurately together to form hairline joints.
- E. Welding: Comply with AWS recommendations and the following:
 - Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.

- F. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space the anchoring devices to secure gratings, frames, and supports rigidly in place and to support indicated loads.
 - Fabricate toeplates to fit grating units and weld to units in shop unless otherwise indicated.
 - 2. Fabricate toeplates for attaching in the field.
 - 3. Toeplate Height: 4 inches unless otherwise indicated.

2.5 METAL BAR GRATINGS

- 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. Alabama Metal Industries Corporation: a Gibraltar Industries company.
 - 2. Fisher & Ludlow; Division of Harris Steel Limited.
 - 3. IKG Industries; a division of Harsco Corporation.
 - 4. Ohio Gratings, Inc.
- B. Removable Grating Sections: Fabricate with banding bars attached by welding to entire perimeter of each section. Include anchors and fasteners of type indicated or, if not indicated, as recommended by manufacturer for attaching to supports.
- C. Fabricate cutouts in grating sections for penetrations indicated. Arrange cutouts to permit grating removal without disturbing items penetrating gratings.
 - 1. Edge-band openings in grating that interrupt four or more bearing bars with bars of same size and material as bearing bars.
- D. Do not notch bearing bars at supports to maintain elevation.
- E. Frames and Supports for Metal Gratings: Fabricate from metal shapes, plates, and bars of welded construction to sizes, shapes, and profiles indicated and as necessary to receive gratings. Miter and weld connections for perimeter angle frames. Cut, drill, and tap units to receive hardware and similar items.
 - 1. Unless otherwise indicated, fabricate from same basic metal as gratings.
 - 2. Equip units indicated to be cast into concrete or built into masonry with integrally welded anchors. Unless otherwise indicated, space anchors 24 inches o.c. and provide minimum anchor units in the form of steel straps 1-1/4 inches wide by 1/4 inch thick by 8 inches long.
- F. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Finish gratings, frames, and supports after assembly.
- G. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.

1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing gratings to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing gratings. Set units accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
- C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete or masonry.
- D. Fit exposed connections accurately together to form hairline joints.
 - 1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade the surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- E. Attach toeplates to gratings by welding at locations indicated.
- F. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
- G. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

3.2 INSTALLING METAL BAR GRATINGS

- A. General: Install gratings to comply with recommendations of referenced metal bar grating standards that apply to grating types and bar sizes indicated, including installation clearances and standard anchoring details.
- B. Attach removable units to supporting members with type and size of clips and fasteners indicated or, if not indicated, as recommended by grating manufacturer for type of installation conditions shown.

C. Attach nonremovable units to supporting members by welding where both materials are same; otherwise, fasten by bolting as indicated above.

3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 09 painting Sections.
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION

SECTION 057300 - DECORATIVE METAL RAILINGS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Decorative metal (ornamental) railings modifications.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - Section 055100 METAL STAIRS AND RAILINGS for other steel stairs, handrails, and quardrails.
 - 2. Section 061000 ROUGH CARPENTRY for wood blocking for anchoring railings.
 - 3. Section 092110 GYPSUM BOARD ASSEMBLIES for metal backing for anchoring railings.

1.3 DEFINITIONS

A. Railings: Guards, handrails, and similar devices used for protection of occupants at open-sided floor areas, pedestrian guidance and support, visual separation, or wall protection.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design railings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
 - 1. Stainless Steel: 60 percent of minimum yield strength.
- C. Structural Performance of Railings: Provide railings capable of withstanding the effects of gravity loads and Code required loads and stresses within limits and under conditions indicated.

- D. Thermal Movements: Provide exterior railings that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. 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.
- E. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.5 SUBMITTALS

- A. Product Data: For each product.
 - 1. Manufacturer's product lines of railings assembled from standard components.
 - 2. Grout, anchoring cement, and paint products.
- B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of metal railings; fabrication; and fastening and anchorage details, including mechanical fasteners. Include plans, elevations, sections, details, and attachments to other work.
- C. Delegated-Design Submittal: For railing products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Samples for Verification: For each type of exposed finish required.
 - 1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
 - 2. Fittings and brackets.
 - 3. Welded connections.
 - 4. Assembled Samples of railing systems, made from full-size components, including top rail, post, handrail, and infill. Show method of finishing members at intersections. Samples need not be full height.
- E. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.
- F. Welding certificates.
- G. Qualification Data: For professional engineer.

1.6 QUALITY ASSURANCE

A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.

- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of metal railings that are similar to those indicated for this Project in material, design, and extent.
- C. Installer Qualifications: Fabricator of products.
- D. Source Limitations: Obtain each type of railing through one source from a single manufacturer.
- E. Welding: Qualify procedures and personnel according to the following:
 - 1. AWS D1.6, "Structural Welding Code--Stainless Steel."
- F. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockups for each form and finish of railing consisting of two posts, top rail, infill area, and anchorage system components that are full height and are not less than 24 inches in length.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.
 - Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating railings without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.

1.8 COORDINATION AND SCHEDULING

- A. Coordinate installation of anchorages for railings. 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.
- B. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Stainless-Steel Ornamental Railings:
 - a. Ametco Manufacturing Corp..
 - b. Blum, Julius & Co., Inc.
 - c. Blumcraft, A Division of C.R. Laurence Co., Inc.
 - d. HDI Railing Systems.
 - e. Livers Bronze Co.
 - f. Wagner, R & B, Inc.; a division of the Wagner Companies.

2.2 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Brackets, Flanges, and Anchors: Same metal and finish as supported rails, unless otherwise indicated.
 - 1. Provide cast-metal brackets with flange tapped for concealed anchorage to threaded hanger bolt.
 - 2. Provide either formed- or cast-metal brackets with predrilled hole for exposed bolt anchorage.
 - 3. Provide extruded-aluminum brackets with interlocking pieces that conceal anchorage. Locate set screws on bottom of bracket.

2.3 STAINLESS STEEL

- A. Tubing: ASTM A 554, Grade MT 304 at interior locations and 316L at exterior locations.
- B. Pipe: ASTM A 312, Grade TP 304 at interior locations and 316L at exterior locations.
- C. Castings: ASTM A 743, Grade CF 8 or CF 20.
- D. Plate and Sheet: ASTM A 666, Type 304 at interior locations and 316L at exterior locations.
- E. Wire Rope: 1 x 19 wire rope made from wire complying with ASTM A 492, Type 316.
- F. Wire-Rope Fittings: Connectors of types indicated, fabricated from stainless steel, and with capability to sustain, without failure, a load equal to minimum breaking strength of wire rope with which they are used.

G. Woven-Wire Mesh Infill Panels: Intermediate-crimp, diamond or square pattern, 2-inch (50-mm) woven-wire mesh, made from 0.135-inch (3.5-mm) nominal diameter stainless steel wire complying with ASTM A580/A580M, Type 304.

2.4 STEEL

A. Woven-Wire Mesh Infill Panels: Intermediate-crimp, diamond or square pattern, 2-inch (50-mm) woven-wire mesh, made from 0.135-inch (3.5-mm) nominal diameter steel wire complying with ASTM A510/A510M.

2.5 FASTENERS

- A. General: Provide the following:
 - 1. Stainless-Steel Components: Type 316 stainless-steel fasteners.
 - 2. Dissimilar Metals: Type 316 stainless-steel fasteners.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
- C. Provide concealed fasteners for interconnecting railing components and for attaching railings to other work, unless exposed fasteners are the standard fastening method for railings indicated.
- D. Anchors: Provide anchors, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

2.6 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Isolation Coating (Bituminous Paint): ASTM D 1187, cold-applied asphalt emulsion, VOC compliant, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- C. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
 - 1. Available Products: Sika; SikaGrout 212; or approved equal.
 - 2. VOC Content: 0 g/L.

2.7 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G. Form changes in direction as detailed on the Drawings and as standard with system selected.
- H. Comply with "Guideline 1: Joint Finishes", by National Ornamental & Miscellaneous Metals Association (NOMMA), as follows:
 - 1. Ornamental Railing: Type 1.
- I. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated.
 - At brackets and fittings fastened to plaster or gypsum board partitions, provide fillers made from crush-resistant material, or other means to transfer wall loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.
- J. Close exposed ends of hollow railing members with prefabricated end fittings.
- K. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.
- 2.8 FINISHES, GENERAL
 - A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.9 STAINLESS-STEEL FINISHES

- A. Remove tool and die marks and stretch lines or blend into finish.
- B. Grind and polish surfaces to produce uniform finish indicated, free of cross scratches.
 - 1. Run grain of directionally textured finishes with long dimension of each piece.
- C. Directional Satin Finish: No. 4.
- D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 - 1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 - 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 - 3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- C. Corrosion Protection: Coat concealed surfaces of aluminum and copper alloys that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

- D. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 ANCHORING POSTS

- A. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.
- C. Cover anchorage joint with flange of same metal as post, attached to post with set screws.
- D. Leave anchorage joint exposed; wipe off surplus anchoring material; and leave 1/8-inch buildup, sloped away from post.
- E. Anchor steel posts to steel with flanges, angle or floor type as required by conditions, welded to posts and bolted to metal supporting members.
- F. Anchor posts to metal surfaces with flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
 - 1. For aluminum railings, attach posts as indicated using fittings designed and engineered for this purpose.
 - 2. For stainless-steel railings, weld flanges to posts and bolt to metal-supporting surfaces.
- G. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.4 ANCHORING RAILING ENDS

- A. Anchor railing ends to concrete and masonry as indicated on the drawings and anchored to wall construction with anchors and bolts.
- B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces.

3.5 ATTACHING HANDRAILS TO WALLS

A. Attach handrails to walls with wall brackets. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface.

- B. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- C. Secure wall brackets to building construction as follows:
 - 1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
 - 2. For hollow masonry anchorage, use toggle bolts.
 - 3. For wood stud partitions, use hanger or lag bolts set into wood backing between studs. Coordinate with carpentry work to locate backing members.
 - 4. For steel-framed partitions, fasten brackets directly to steel framing or concealed steel reinforcements using self-tapping screws of size and type required to support structural loads.

3.6 CLEANING

A. Clean stainless steel by washing thoroughly with clean water and soap, rinsing with clean water, and wiping dry.

3.7 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in field to shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION

Orange-Ulster BOCES Emanuel Axelrod Special Education Center Additions & Alterations

SECTION 061000 ROOF CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Applicable provisions of the Conditions of the Contract and Division 1, General Requirements, govern work in this Section.

1.2 DESCRIPTION OF WORK

- A. This section describes roof related carpentry work, different specification sections describe other carpentry work.
- B. The work of this Section includes all plant, labor, materials, equipment, testing and services necessary to complete the work shown on the drawings, schedules and notes, as specified herein, and as may be required by conditions and authorities having jurisdiction, including, but not limited to, the following:
 - 1. Roof related wood nailers, blocking, shims and plywood.
 - 2. Roof related light gauge metal eave and curb assemblies.
 - 3. Re-secure existing roof related blocking; remove and separate multiple layers of blocking, and secure each layer individually if necessary.
- 1.3 RELATED WORK SPECIFIED ELSEWHERE Entire Project Specification with specific reference to those sections noted above and as follows:

A. 040100 Masonry Maintenance

B. 075323 EPDM Roofing

C. 076200 Sheet Metal Flashing & Specialties

D. 077200 Roof Accessories

E. 013113 & Divisions 21, 22, 23 and 26 Mechanical and Electrical

1.4 QUALITY ASSURANCE

A. Installer Qualifications:

- A firm (Installer) with at least 5 continuous years experience performing work similar to that required for this project, employing personnel skilled in the work specified.
 - a. The Installer shall directly employ the personnel performing the work of this section.
 - b. The Installer shall have a supervisor on the roof when work is in progress. The Supervisor shall have a minimum of 5 years experience with work similar in nature and scope to this project, and speak fluent English.
 - 1. Submit the supervisor's resume upon request.

- 2. The Installer shall provide a reference list of at least three previously completed projects of comparable size and similar design, within fifty miles of this project, which may be observed by representatives of the Owner:
 - a. The reference list shall include at a minimum, the completion date, a description of the work performed, the Owner's name contact person phone number and address and the Architect's name contact person and phone number.
 - b. Submit the reference list upon request.
- B. Material Quality: Obtain each type of material from a single source to ensure consistent quality, color, pattern, and texture.
- C. Pre-Construction: Attend the pre-construction meeting and discuss how and when carpentry work will be performed and coordinated with other work, and how the building will be kept watertight as work occurs.

1.5 SUBMITTALS

- A. Submit the following items far enough in advance to obtain approval prior to performing any work on site:
 - 1. A pre-work site and building inspection report with photos, to document conditions before work starts on site.
 - 2. Manufacturer's technical literature for all material, to identify the product and manufacturer.
 - 3. Test reports and certifications substantiating compliance with specification requirements if requested by the Architect.
 - 4. 2 foot long on-site samples which show the size, shape, configuration and method of fastening for all wood blocking assemblies, and which show how the blocking assemblies will relate to and fit on adjoining work.
- B. Simultaneously provide all roof related submittals needed for this project, for all technical sections, collated by section. Incomplete and incorrect submittals will not be reviewed.
 - 1. Submittals shall be prepared and made by the firm that will perform the actual work.
 - 2. Provide electronic submittals via an on-line submittal exchange program if one is established for this project; if an on-line program is not established, provide the submittals on portable USB drives in pdf format, organized in folders by Section.
 - a. Do not send technical submittals via email.
 - b. Do not include Safety Data Sheets with the technical submittals.
- C. Safety Data Sheets: Simultaneously provide all Safety Data Sheets needed for this project, for all specification sections collated by section, in three ring binders. Provide two binders for each building.

D. Payment requisitions will not be processed until all submittals are received and approved.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store materials dry at all times. Cover with tarps and protect against exposure to weather and contact with damp or wet surfaces.
- B. Do not overload the structure when storing material on the roof.
- C. Protect roof surfaces where material and equipment are placed on them, and where construction traffic occurs, with 6 mil fire retardant polyethylene, covered with 1-1/2 inch thick foam insulation, overlaid with 2 by 10 wooden planks.

1.7 GUARANTEE

- A. Provide a written Contractor's Guarantee which guaranties that all work will remain free of material and workmanship defects and in a watertight condition for five years beginning upon Final Completion:
 - 1. Defects include but are not limited to the following: leakage, delamination, lifting, loosening, splitting, cracking, joint separation and movement.
 - 2. Guarantee coverage shall provide the repairs and modifications necessary to enable the work to perform as guaranteed.
 - 3. Guarantee coverage shall include removing and replacing items installed as part of the original work, if removal is needed to make repairs.
- B. Provide one Guarantee that covers "all work performed" when a single contractor is awarded work specified in multiple Sections.
- C. The Guarantee shall take effect no more than 30 days before the satisfactory completion of all punch list work.
- D. The Contractor's Surety Company may add a rider to the Performance Bond which clarifies that Performance Bond Coverage expires two years after Final Completion; i.e., Performance Bond Coverage does not run for the entire five year term of the Contractor's Guarantee.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. WOOD, including shims, nailers, blocking, furring and similar members, in the sizes indicated, worked into the shapes shown, and as follows:
 - 1. Lumber: Douglas Fir dimension lumber, free of large knots and other imperfections.
 - 2. Plywood: Exterior grade APA rated Type CDX underlayment plywood.

- 3. Beveled Siding: Utility grade cedar, redwood, or synthetic siding, 1/2 inch by 6 inches and 3/4 inch by 10 inches wide, tapered to 1/8 inch thick.
- B. METAL, for roof eave assemblies and curbs, including light gauge metal channel and stud sections factory formed of minimum 23 gauge cold rolled galvanized steel.

2.2 FASTENERS

- A. Hot dipped galvanized steel, stainless steel, or steel covered with a proprietary rust inhibiting coating.
 - 1. Do not use un-coated steel nails. Remove and replace carpentry components installed with un-coated steel nails.
- B. Use screws wherever possible, minimum size diameter #12. If nails are used, they shall be annular ring shank type.
 - 1. Do not use dry wall screws to secure wood blocking assemblies. Remove and replace carpentry components installed with drywall screws.

2.3 CARPENTRY ACCESSORIES

- A. Gypsum board & related accessories: 5/8 inch thick Type X Firecode gypsum board, galvanized drywall screws, asbestos free factory pre-mixed joint compound, joint tape, and galvanized steel J, L and corner beads.
- B. Fiberglass batt insulation: un-faced fiberglass insulation, minimum thickness 6 inches, and as needed to fill the expansion joints.
- C. Rockwool batt insulation: un-faced blown fiber insulation, minimum thickness 6 inches, and as needed to fill the expansion joints.

2.4 PRIMER AND PAINT

A. Interior "Fresh Start" latex primer by Benjamin Moore and interior flat finish wall paint, to paint the skylight wells.

PART 3 - EXECUTION

3.1 INSTALLATION – GENERAL

- A. Coordinate carpentry work with the installation of the roofing system, insulation, flashings, and other similar items.
- B. Shim and set carpentry work plumb and true, except provide slope at the top surfaces of horizontal members as indicated.
- C. Stagger joints in built up assemblies at least 2 feet to obtain maximum strength. Provide the shapes needed and adjust wood blocking to suit the existing conditions and achieve full bearing and secure attachment. Discard defective material, and pieces which are too small, and fabricate the work with a minimum of joints and an optimum joint arrangement.

- D. Securely attach carpentry work to resist a force of 275 pounds per lineal foot in any direction. Countersink all fasteners flush unless otherwise shown.
- E. Space fasteners to achieve adequate holding power, and generally 12 inches apart.
 - 1. Space nails in wood blocking 8 inches apart.
 - 2. Install two rows of fasteners on blocking wider than 5 inches.
- F. Fit carpentry work neatly scribed and cut to fit within 1/8 inch of adjoining materials. Position furring, nailers, blocking, shims and similar supports for the proper attachment of subsequent work.
- G. Fasten wood blocking to underlying steel members at gypsum and light-weight concrete deck areas, with screws. Pre-drill holes in the steel members or utilize self drilling / tapping screws.
- H. Fasten wood and metal blocking assemblies to metal decks with #12 screws.
- I. Fasten wood and metal blocking assemblies to concrete decks and masonry walls with 1/4 inch diameter Spike or Drive fasteners. Pre-drill the holes.

3.2 CLEANING, PROTECTION AND WATERTIGHTNESS

- A. Inspect the interior and exterior of the building and grounds, and submit a written report with photos to document any pre-existing leakage or damage, prior to performing any other work on site.
- B. The Owner will conduct a similar inspection at the completion of the work, and the Contractor will be charged for all leaks and damage that were not documented in the Contractor's report, or repaired to the Owners satisfaction at the Contractor's expense.
- C. Provide any equipment, material and labor necessary to protect the site, the building, its contents and occupants, pedestrians, and surrounding landscaped and paved areas from damage due to the construction work or from inclement weather during construction.
- Do not perform work during inclement weather. Protect incomplete work and the building from damage by inclement weather - which may occur unexpectedly. Make all work areas watertight at the end of each day's work.
- E. Clean up all litter, refuse, rubbish, scrap materials and debris at least twice a day; at noon and at the end of the work day, so the roof and site are neat, orderly and workmanlike. Place the debris in a dumpster, and remove the dumpster from the site as soon as it is full or no longer being used.
- F. Carefully and thoroughly clean the entire roof to remove all residual debris when all work is complete. After cleaning the roof, thoroughly clean all drain sumps, drain lines, leader heads and leaders. Do not allow debris to enter the drainage system.

END OF SECTION

SECTION 061050 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Wood blocking, cants, and nailers.
 - 2. Plywood backing panels.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 042000 UNIT MASONRY for wood nailers and blocking built into masonry.
 - 2. Section 061600 SHEATHING for plywood and gypsum sheathing.
 - 3. Section 064020 INTERIOR ARCHITECTURAL WOODWORK for interior woodwork not specified in this Section.
 - 4. Section 092110 GYPSUM BOARD ASSEMBLIES for sheet metal backing.

1.3 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product.
 - Indicate component materials and dimensions and include construction and application details
 - 2. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used, net amount of preservative retained, and chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
 - Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials, both before and after exposure to elevated temperatures when tested according to ASTM D 5516 and ASTM D 5664.
 - 4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
 - 5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber, plywood, and other panels; place spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 - 3. Provide dressed lumber, S4S, unless otherwise indicated.
 - 4. Provide dry lumber with 15 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.

B. Plywood Panels:

- 1. Plywood: Either DOC PS 1 or DOC PS 2, unless otherwise indicated.
- 2. Thickness: As needed to comply with requirements specified but not less than thickness indicated.
- 3. Factory mark panels according to indicated standard.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
 - a. Use Borate or Copper Azule treatments. Product shall not contain creosote, arsenic or pentachlorophenol.
 - 2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

- B. Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber and 18 percent for plywood. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete in exterior walls.
- E. Available Products: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Hoover Treated Wood Products; PyroGuard.
 - 2. Koppers Performance Chemicals; LifeWood MicroPro Treatment.
 - 3. Sustainable Northwest Wood; Pressure Treated Wood with Copper Azule.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: For fire-rated exterior walls, all interior use materials, and where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
 - 1. Treatment shall not promote corrosion of metal fasteners.
 - 2. Exterior Type: Treated materials shall comply with requirements specified above for fireretardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 - Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 - 4. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841.
 - 5. Product shall not contain creosote, arsenic or pentachlorophenol.
- C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent. Kiln-dry plywood after treatment to maximum moisture content of 15 percent.

- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
- E. Available Products: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Technologies Boralife Inc.; Boraflame.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide FRTW lumber for support or attachment of other construction, including, but not limited to, the following: Rooftop equipment bases and support curbs, blocking, cants, nailers, furring and grounds.
- B. For items of dimension lumber size, provide Construction, Stud, or No. 2 grade lumber with 15 percent moisture content.

2.5 PANEL PRODUCTS

- A. Miscellaneous Concealed Plywood: Exposure 1 sheathing, span rating to suit framing in each location, and thickness as indicated but not less than 1/2 inch.
- B. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2 inch thick.

2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
 - 1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.
- B. Nails, Wire, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. Wood Screws: ASME B18.6.1.
- E. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A with ASTM A 563 hex nuts and, where indicated, flat washers.

- G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5; except provide stainless steel complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2, where in contact with pressure-preservative treated wood or when exposed to exterior conditions.

2.7 MISCELLANEOUS MATERIALS

- Adhesive, Including Gluing Furring and Sleepers to Concrete or Masonry: Formulation A. complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.
 - 1. Available Products: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Henkel Corp.: Loctite PL Premium Polyurethane Construction Adhesive.
 - b. Henkel Corp.; OSI SF450 Heavy Duty Subfloor Construction Adhesive.
 - Low-Emitting Materials: Provide adhesives in compliance with the requirements of the 2. California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - 3. VOC Content: 70 g/L or less.
 - Do not use adhesives that contain urea formaldehyde. 4.
 - Methylene chloride and perchloroethylene may not be intentionally added to adhesives.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- Α. Discard units of material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.
- Set carpentry to required levels and lines, with members plumb, true to line, cut, and B. fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- C. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.
- D. Securely attach carpentry work as indicated and according to applicable codes and the following:

- 1. Table 2304.10.1, "Fastening Schedule," in ICC's International Building Code (IBC).
- 2. ICC-ES evaluation report for fastener.
- E. Countersink fastener heads on exposed carpentry work and fill holes with wood filler.
- F. Use fasteners of appropriate type and length. Predrill members when necessary to avoid splitting wood.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

- A. Install as required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Gypsum sheathing.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 042000 UNIT MASONRY for masonry-veneer anchors and insulation in cavity wall construction.
 - 2. Section 054000 COLD-FORMED METAL FRAMING for metal framing at exterior wall.
 - 3. Section 061000 ROUGH CARPENTRY for plywood backing panels.
 - 4. Section 076200 SHEET METAL FLASHING AND TRIM for flashing applied to gypsum sheathing.

1.3 DEFINITIONS

A. Gypsum Board Construction Terminology Standard: Refer to ASTM C 11 and GA-505 for definitions of terms for gypsum sheathing board construction not defined in this Section or in other referenced standards.

1.4 SUBMITTALS

A. Product Data: For each product specified.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain each gypsum sheathing product through one source from a single manufacturer.
- B. Fire-Resistance-Rated Assemblies: Where gypsum sheathing boards are part of fire-resistance-rated assemblies, provide assemblies as follows:

- Assemblies comply with requirements of fire-response-tested assemblies indicated by GA File Numbers in GA-600, "Fire Resistance Design Manual"; or by design designations in UL's "Fire Resistance Directory" or in certification listings of another testing and inspecting agency acceptable to authorities having jurisdiction.
- 2. Fire-resistance ratings were determined by fire-response testing assemblies according to ASTM E 119.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles, each bearing brand name and identification of manufacturer.
- B. Store materials protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, or other causes. Neatly stack gypsum sheathing board flat on leveled supports off the ground, under cover, and fully protected from weather.

1.7 SEQUENCING AND SCHEDULING

- A. Sequence installing sheathing with installing exterior cladding to comply with requirements indicated below:
 - 1. Do not leave glass-mat gypsum sheathing board exposed to weather for more than 180 days.

PART 2 - PRODUCTS

2.1 SHEATHING BOARD

- A. Glass-Mat Gypsum Sheathing Board: ASTM C 1177.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed Corp.; GlasRoc.
 - b. Georgia-Pacific Gypsum LLC; Dens-Glass Gold.
 - c. National Gypsum Company; Gold Bond, e²XP.
 - d. USG Corporation; Securock.
 - 2. Type and Thickness: 5/8 inch, Type X.
 - 3. Building Product Disclosure and Optimization, Environmental Product Declarations (EPD): Type III EPD.

2.2 FASTENERS

A. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing

board to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

1. For steel framing from 0.033 to 0.112 inch thick, attach sheathing to comply with ASTM C 954.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install gypsum sheathing to comply with GA-253 and manufacturer's written instructions.
- B. Cut boards at penetrations, edges, and other obstructions of the work; fit tightly against abutting construction, except provide a 3/8-inch setback where non-load-bearing construction abuts structural elements.
- C. Coordinate sheathing installation with flashing and joint sealant installation so these materials are installed in the sequence and manner that prevent exterior moisture from passing through completed exterior wall assembly.
- D. Apply fasteners so screw heads bear tightly against face of sheathing boards but do not cut into facing.
- E. Do not bridge building expansion joints with sheathing; cut and space edges to match spacing of structural support elements.
- F. Vertical Installation: Install 48-inch- wide gypsum sheathing boards vertically with vertical edges centered over flanges of steel studs. Abut ends and edges of each board with those of adjacent boards. Screw-attach boards at perimeter and within field of board to each steel stud:
 - 1. Perimeter: 6 inches on center.
 - 2. Field: 8 inches on center.

SECTION 062010 - EXTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Exterior wood soffits, and trim.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 061600 SHEATHING for sheathing substrate for air barrier system.
 - 2. Section 072100 THERMAL INSULATION for insulation in studs.
 - 3. Section 072700 AIR BARRIERS for fluid-applied air barriers and membrane flashings.
 - 4. Section 076200 SHEET METAL FLASHING AND TRIM for metal flashings.
 - 5. Section 079200 JOINT SEALANTS for field-applied sealants not otherwise specified in this Section.
 - 6. Section 099000 PAINTING AND COATING for field-finishing work of this Section.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Indicate location and nailing pattern for exposed surface nailing, as required by project conditions.
- C. Samples for Verification: For each type, color, texture, and pattern required.
 - 1. 12-inch-long-by-actual-width Sample of soffits and trim.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of building insulation through one source from a single manufacturer.
- B. Mock-Up: Mock-up of exterior wall including wood siding is required. Comply with requirements of Section 014330 MOCKUPS.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."
 - 1. Meet with the Owner Project Manager; Architect, Owner insurer if applicable; testing and inspecting agency representative; siding Installer; siding manufacturer's senior

- representative; sheathing and air barrier Installer; and installers whose work interfaces with or affects siding, including installers of windows and doors.
- 2. Review methods and procedures related to siding installation, including manufacturer's written instructions.
- 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- 4. Examine substrate conditions for compliance with requirements, including flatness and fastening.
- 5. Review flashings, special siding details, siding penetrations, trim installation, and finishes.
- 6. Review temporary protection requirements for siding during and after installation.
- 7. Review siding observation and repair procedures after siding installation.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials in a dry, well-ventilated, weathertight place.

1.6 PROJECT CONDITIONS

A. Weather Limitations: Proceed with siding installation only if substrate is completely dry and if existing and forecasted weather conditions permit siding to be installed according to manufacturer's written instructions.

1.7 SEQUENCING

A. Coordinate installation with flashings and other adjoining construction to ensure proper sequencing.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace siding that does not comply with requirements or that fails within specified warranty period. Failures include, but are not limited to, cracking, deforming, fading, or otherwise deteriorating beyond normal weathering.
 - 1. Fading is defined as loss of color, after cleaning with product recommended by manufacturer, of more than Hunter color-difference units as measured according to ASTM D 2244.
 - 2. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," for lumber and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee Board of Review.
- B. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

1. For exposed lumber, furnish pieces with grade stamps applied to ends or back of each piece, or omit grade stamps entirely and provide certificates of grade compliance issued by inspection agency.

2.2 ACCESSORIES

- A. Blocking, Shims, and Nailers: Fire-retardant-treated softwood lumber, kiln dried to less than 15 percent moisture content.
- B. Flashing: Provide metal flashing complying with Section 076200 SHEET METAL FLASHING AND TRIM at window and door heads and where indicated.
- C. Screws: Select material, type, size, and finish required for each use, nonferrous metal or hotdip galvanized, unless otherwise indicated. Comply with ASME B18.6.1 for applicable requirements.
 - 1. For fastening to metal, use ribbed bugle-head screws of sufficient length to penetrate a minimum of 1/4 inch or 3 screw-threads into substrate.

2.3 FABRICATION

- A. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to relative humidity conditions existing during time of fabrication and in installation areas.
- B. Fabricate woodwork to dimensions, profiles, and details indicated.
- C. Complete fabrication, including assembly, finishing, and hardware application, before shipment to Project site to maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- D. Shop-cut openings, to maximum extent possible, to receive hardware, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Smooth edges of cutouts and seal edges with the linseed-based wood stain selected for the exposed face.

2.4 EXTERIOR TONGUE AND GROOVE SOFFITS

- A. Provide Red Cedar siding, Clear Grade, absolutely no knots, Plain Sawn:
 - 1. Exposure: As indicated.
 - 2. Sizes and Shapes: Custom milled as indicated on the Drawings.

2.5 SHOP PAINT

- A. Linseed Based Wood Stains: Provide products of one of the following manufacturers that meet or exceed specified requirements:
 - 1. Samuel Cabot, Inc. (Cabot) "Clear Solutions," "Bleaching Oil 6241"
 - 2. Olympic Stain. (Olympic) "Weathering Stain" 350 g/l VOC max.

B. Application: Provide one coat of stain on all sides of each piece, at spreading rate recommended by stain manufacturer for exterior wood siding, soffits, and trim. Color shall match Architect's sample.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of siding and related accessories.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

3.3 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
 - 1. Do not install damaged components.
 - Center nails in elongated nailing slots without binding siding to allow for thermal movement.
 - 3. Cut edges shall be sealed with wood stain selected for the exposed face finish.
- B. Dress and sand finish carpentry work free from machine and tool marks, mill glaze, abrasions, raised grain, or other defects on surfaces exposed to view.
- C. Provide tight joints formed to conceal shrinkage. Fit butt joints with concealed spline. Glue and dowel shop miters which are four inches or greater. Glue and spline miters less than 4 in., with spline concealed.
- D. Blind nail work to the greatest extent possible. Where surface nailing is required by project conditions, set and fill nails to match adjacent wood. Surface nailing shall be done with nails equally spaced, vertically and horizontally aligned.
 - 1. Provide concealed nailing as specified. Nail shall be in tongue of siding in a position where it will not be visible in the reveal when the next board is installed.
 - 2. Where exposed surface nailing is required by project conditions, Architect shall approve location and nailing pattern.
- E. Install joint sealants as specified in Section 079200 JOINT SEALANTS and to produce a weathertight installation.

3.4 ADJUSTING AND CLEANING

A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

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B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

SECTION 064020 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Plastic-laminate casework.
 - 2. Plastic-laminate countertops.
 - 3. Solid-surfacing-material countertops.
 - 4. Closet and utility shelving.
 - 5. Shop finishing of interior woodwork.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 061000 ROUGH CARPENTRY for wood furring, blocking, shims, and hanging strips required for installing woodwork and concealed within other construction before woodwork installation.
 - 2. Section 064200 PANELING for wood paneling.
 - 3. Section 099000 PAINTING AND COATING for field finishing work of this Section.

1.3 SUBMITTALS

- A. Product Data: For each type of product specified, including casework hardware and accessories, and finishing materials and processes.
 - 1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 - 1. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
 - a. Provide schedule of blocking required to support the Work of this Section.

- 2. Show locations and sizes of cutouts and holes for plumbing fixtures, electrical components and other items installed in architectural woodwork.
- 3. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.

C. Samples for Verification:

- 1. Lumber with or for transparent finish, not less than 5 inches wide by 12 inches long for each species and cut, finished on 1 side and 1 edge.
- 2. Veneer leaves representative of and selected from flitches to be used for transparent-finished woodwork.
 - a. Submit step-type range sample sets of factory finished plywood and factory finished solid wood in size illustrating wood grain and specified finish, including edge banding detail and any veneer or solid edge glue joints.
 - b. Submit one leaf for every 1000 gross square foot of veneer required.
- 3. Lumber and panel products with shop-applied opaque finish, 5 inches wide by 12 inches long for lumber and 8 by 10 inches for panels, for each finish system and color, with 1/2 of exposed surface finished.
- 4. Plastic laminates, 8 by 10 inches for each type, color, pattern, and surface finish, with 1 sample applied to core material, and specified edge material applied to 1 edge.
- 5. Solid-surfacing materials, 6 inches square.
- D. Qualification Data: For Installer and fabricator.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of interior architectural woodwork with blueprint-matched wood veneers and components.
- C. Quality Standard: Unless otherwise indicated, comply with AWI/AWMAC/WI's "Architectural Woodwork Standards," latest edition, including errata, for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.
- D. Fire-Test-Response Characteristics: Where fire-retardant materials or products are indicated, provide materials and products with specified fire-test-response characteristics as determined by testing identical products per test method indicated by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having

jurisdiction, imprint on surfaces of materials that will be concealed from view after installation.

- Fire-Test-Response Characteristics of Upholstery Fabric and Padding: Comply with California Technical Bulletin 117-2013 Update, with no chemical flame retardants.
- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
 - 1. The HVAC systems as specified elsewhere may not provide for humidity controls. The expected ranges of relative humidity are expected to be as high as 55% to a low of uncontrolled during the heating system. Comply with AWS Section 2, Care and Storage.
- B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.
 - Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.7 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 BASIS-OF-DESIGN

- A. Basis-of-Design Products:
 - 1. Solid Surface SS1: Corian.
 - a. Color: Laguna Terrazzo.
 - b. Location: Countertops/splashes in Classrooms/ Lifeskills/ Library.
 - 2. Solid Surface SS2: Corian.
 - a. Color: Sorrel.
 - b. Location: Window sills.
 - 3. PL-3 -PLAM: Wilsonart Vertical surfaces
 - a. Color:
 - 1) PL1-French Pear 8220-38 (upper cabinets/shelving).
 - 2) PL-2 Phantom Ecru 8212K-28 (base cabinets, mailboxes, tall storage, cubbies, and low open shelving
 - 3) PL-3 Handspun Pearl 5033-38 at Countertop at Security Room #610
 - b. Location: Classrooms/ Life Skills/ Office

2.2 MATERIALS

- A. General: Provide materials that comply with requirements of AWI/AWMAC/WI's "Architectural Woodwork Standards" for each type of woodwork and quality grade specified, unless otherwise indicated.
- B. Environmental Product Declarations (EPD): Industry-wide EPDs for wood products and plastic laminates are available from the American Wood Council and Canadian Wood Council.
- C. Certified Wood: Materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
 - 1. Salvaged and reclaimed wood is excluded from certified wood requirements.

- D. Recycled Content of Medium-Density Fiberboard and Particleboard: Provide products with an average recycled content so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.
- E. Wood Veneers and Lumber: Provide AWI Custom Grade materials and workmanship, unless otherwise indicated. For species not listed in the AWS comply with the following:
 - Provide AWI Lumber Grade 1 and AWI Grade A Veneer, book-matched, minimum 6 inch face veneer width. Kiln dry to 6-8 percent moisture content. Components shall be free of defects and sapwood. Match adjacent pieces for color and grain pattern.
 - 2. Single-Source Requirement for Wood Veneers and Solids: Intent is to provide wood which matches as closely as possible throughout the project. Provide wood veneers and solids from the same distributor, and from the same flitches and solids sources to the greatest extent possible.
- F. Wood Species and Cut for Transparent Finish: As selected by the Architect.
 - 1. Architect's control samples for transparent finish, veneer grain and figure characteristics are available for review at the office of the Architect.
 - 2. Veneer Matching Requirements:
 - a. Matching Between Adjacent Veneer Leaves: Book match and architectural end match.
 - b. Matching Within Individual Panel Faces: Balance and Center Match.
 - c. Method of Matching Panels: Blueprint-matched panels and components.
- G. Wood Species for Opaque Finish: Any closed-grain hardwood.
- H. High-Pressure Decorative Plastic Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering high-pressure decorative laminates that may be incorporated into the Work include, but are not limited to, the following:
 - a. Abet Laminati, Inc.
 - b. Arborite; a division of Wilsonart.
 - c. Formica Corporation.
 - d. Lamin-Art; a division of Wilsonart.
 - e. Nevamar, Panolam, and Pionite; divisions of Panolam Surface Systems.
 - f. Wilsonart LLC.
- I. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with ISFA-2.

- 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. Avonite Surfaces: Aristech Surfaces.
 - b. E. I. du Pont de Nemours and Company; Corian.
 - c. Formica Corporation.
 - d. LG Hausys; Hi-Macs.
 - e. Wilsonart LLC.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this Article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified.
 - 1. Do not use treated materials that do not comply with requirements of referenced woodworking standard or that are warped, discolored, or otherwise defective.
 - 2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
 - 3. Identify fire-retardant-treated materials with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Comply with performance requirements of AWPA C20 (lumber) and AWPA C27 (plywood). Use the following treatment type:
 - 1. Exterior Type: Organic-resin-based formulation thermally set in wood by kiln drying.
 - 2. Mill lumber before treatment and implement special procedures during treatment and drying processes that prevent lumber from warping and developing discolorations from drying sticks or other causes, marring, and other defects affecting appearance of treated woodwork.
 - 3. Kiln-dry materials before and after treatment to levels required for untreated materials.
- C. Fire-Retardant Particleboard: Panels complying with the following requirements, made from softwood particles and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 25 or less per ASTM E 84.
 - 1. Fire-Retardant Fiberboard and Particleboard: Provide five ply construction with crossbands to prevent any ammonia fuming from the core to the face veneers.

2.4 CASEWORK HARDWARE AND ACCESSORIES

- A. General: Provide casework hardware and accessory materials associated with architectural casework, except for items specified in Section 087100 DOOR HARDWARE.
- B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602,100 degrees of opening, self-closing.
- C. Back-Mounted Pulls: BHMA A156.9, B02011.
 - 1. Basis of Design: Havele, Stainless Steel Item #104.74.061.
- D. Catches: Push-in magnetic catches, BHMA A156.9, B03131.
- E. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081 or BHMA A156.9, B04102; with shelf brackets, B04112.
- F. Drawer Slides: BHMA A156.9, B05091; side mounted and extending under bottom edge of drawer; full-extension type; epoxy-coated-steel with steel ball-bearings; of the following grades:
 - 1. Box Drawer Slides: Grade 1.
 - 2. File Drawer Slides: Grade 1HD-100.
 - 3. Pencil Drawer Slides: Grade 2.
 - 4. Keyboard Slides: Grade 1.
 - 5. Trash Bin Slides: Grade 1HD-100.
- G. Aluminum Slides for Sliding Glass Doors: BHMA A156.9, B07063.
- H. Door Locks: BHMA A156.11, E07121 to be provided at cabinets.
- I. Drawer Locks: BHMA A156.11, E07041.
- J. Grommets for Cable Passage through Countertops: Molded-plastic grommets and matching plastic caps with slot for wire passage.
- K. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 - 1. Satin Stainless Steel: BHMA 630.
 - 2. Satin Aluminum, Clear Anodized: BHMA 628.
- L. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.5 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln dried to less than 15 percent moisture content.

- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.
- C. Installation Adhesives and Wood Glues: Formulations approved for use indicated by adhesive manufacturer.
 - Low-Emitting Materials: Provide adhesives in compliance with the requirements
 of the California Department of Public Health's "Standard Method for the Testing
 and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources
 Using Environmental Chambers."
 - 2. VOC Limits: Use installation adhesives that comply with the following limits for VOC content:
 - a. Wood Glues: 30 g/L.
 - b. Contact Adhesives: Not permitted on the Project without Architect's prior approval.
 - 3. Do not use adhesives that contain urea formaldehyde.
 - 4. Methylene chloride and perchloroethylene may not be intentionally added to adhesives.

2.6 FABRICATION, GENERAL

- A. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.
- B. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.
- C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 - 1. Corners of Casework and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch.
- D. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- E. Shop-cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 1. Seal edges of openings in countertops with a coat of varnish.

F. Install glass to comply with applicable requirements in Section 088000 - GLAZING and in GANA's "Glazing Manual." For glass in wood frames, secure glass with removable stops.

2.7 PLASTIC-LAMINATE CASEWORK

- A. Grade: Custom.
- B. AWI Type of Casework Construction: Flush overlay.
- C. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:
 - 1. Horizontal Surfaces Other Than Tops: Grade HGS.
 - 2. Postformed Surfaces: Grade HGP.
 - 3. Vertical Surfaces: Grade HGS.
 - 4. Edges: Grade HGS.
- D. Materials for Semiexposed Surfaces:
 - Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, Grade VGS.
 - a. Edges of Plastic-Laminate Shelves: PVC tape, 0.018-inch minimum thickness, matching laminate in color, pattern, and finish.
 - b. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, Grade VGS.
 - 2. Drawer Sides and Backs: Solid-hardwood lumber.
 - 3. Drawer Bottoms: Hardwood plywood.
- E. Concealed Backs of Panels with Exposed Plastic Laminate Surfaces: High-pressure decorative laminate, Grade BKL.

2.8 PLASTIC-LAMINATE COUNTERTOPS

- A. Grade: Custom.
- B. High-Pressure Decorative Laminate Grade: HGS.
- C. Edge Treatment: Matching PVC edge.
- D. Core Material: Exterior-grade plywood.
- E. Backer Sheet: Provide plastic-laminate backer sheet, Grade BKL, on underside of countertop substrate.

2.9 SOLID-SURFACING-MATERIAL COUNTERTOPS

- A. Grade: Custom.
- B. Fabricate tops in one piece, unless otherwise indicated. Comply with solid-surfacing-material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing.
 - 1. Fabricate tops with shop-applied edges of materials and configuration indicated.
 - 2. Fabricate tops with loose backsplashes for field application.
- C. Drill holes in countertops for plumbing fittings and soap dispensers in shop.

2.10 CLOSET AND UTILITY SHELVING

- A. Grade: Custom.
- B. Shelf Material: 1-inch plastic laminate-faced panel product with solid-lumber edge.
- C. Cleats: 3/4-inch solid lumber.
- Standards for Adjustable Shelf Brackets: BHMA A156.9, B04102; powder-coatfinished steel.
- E. Adjustable Shelf Brackets: BHMA A156.9, B04112; powder-coat-finished steel.
- F. Clothes Rods: 1-5/16-inch-diameter, chrome-plated-steel tubes.
 - 1. Rod Flanges: Chrome-plated steel.

2.11 SHOP FINISHING

- A. General: Comply with AWI/AWMAC/WI's "Architectural Woodwork Standards" for factory finishing.
 - 1. Finish architectural woodwork at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
- B. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.
 - Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling and to end-grain surfaces. Concealed surfaces of plastic-laminate-clad woodwork do not require backpriming when surfaced with plastic laminate, backing paper, or thermoset decorative panels.

- C. Shop Priming: Shop apply the prime coat including backpriming, if any, for opaque-finished items specified to be field finished. Refer to Section 099000 PAINTING AND COATING for material and application requirements.
- D. Transparent Finish: Comply with requirements indicated below for grade, finish system, staining, and sheen with sheen measured on 60-degree gloss meter per ASTM D 523:
 - 1. Grade: Same as item to be finished.
 - 2. AWS Finish System 5: Conversion varnish.
 - 3. Washcoat for Closed-Grain Woods: Apply washcoat sealer to woodwork made from closed-grain wood before staining and finishing
 - 4. Staining: Match approved sample for color.
 - 5. Open Finish for Open-Grain Woods: Do not apply filler to open-grain woods.
 - 6. Sheen: Satin, 30-50 gloss units.
 - 7. Effect: Partially filled pore.
- E. Opaque Finish: Comply with requirements indicated below for grade, finish system, color, effect, and sheen, with sheen measured on 60-degree gloss meter per ASTM D 523.
 - 1. Grade: Same as item to be finished.
 - 2. AWS Finish System 5: Conversion varnish.
 - 3. Color: As selected by Architect from manufacturer's full range.
 - 4. Sheen: Satin, 30-50 gloss units.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.
- B. Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.
- C. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.

- D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.
- F. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
- G. Casework: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 1. Install casework with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 - 2. Maintain veneer sequence matching of casework with transparent finish.
 - 3. Attach casework to walls with mechanical fasteners. Do not use adhesives, so that casework may be removed and salvaged in the future.
- H. Countertops: Anchor securely by screwing through corner blocks of base casework or other supports into underside of countertop.
 - 1. Align adjacent countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
 - 2. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 - 3. Secure backsplashes to tops with concealed metal brackets at 16 inches and to walls with adhesive.
 - 4. Calk space between backsplash and wall with sealant specified in Section 079200 JOINT SEALANTS.
- I. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.

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C. Clean woodwork on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

SECTION 064200 - PANELING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Solid phenolic core paneling.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - Section 061000 ROUGH CARPENTRY for wood furring, blocking, shims, and hanging strips required for installing woodwork and concealed within other construction before woodwork installation.

1.3 DEFINITIONS

A. Paneling includes wood furring, blocking, and shims for installing paneling, unless concealed within other construction before paneling installation.

1.4 SUBMITTALS

- A. Product Data: Submit sufficient manufacturer's data to indicate compliance with these specifications, including:
 - 1. Site preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation instructions or methods.
- B. Shop Drawings: As required, submit elevations of each wall showing location of paneling and trim members with respect to all discontinuities in the wall elevation.
- C. Selection Samples: Submit standard samples representing manufacturer's full range of available colors and patterns, as required by extent of project.
- D. Samples for Verification: As required, submit sample for each component and for each exposed finish. Mock-ups may be requested complete with exposed molding and trim samples. Sample to indicate type, finish, and color specified.

- 1. Ultra-durable solid phenolic panel: Submit 6" (154mm) by 10" (254mm), or manufacturer's standard "jumbo" sample, of each selected pattern or color. When available, a manufacturer's match in HPL may be substituted for full thickness product.
- E. Manufacturers' Safety Data Sheets (SDS) for adhesives, or other products as appropriate, are available and can be provided by request prior to material delivery to the site.
- F. Installation and/or maintenance instructions

1.5 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Where fire-retardant materials or products are indicated, provide materials and products with specified fire-test-response characteristics as determined by testing identical products per test method indicated by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having jurisdiction, imprint on surfaces of materials that will be concealed from view after installation.
- B. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver paneling until painting and similar operations that could damage paneling have been completed in installation areas. If paneling must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install paneling until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where paneling is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

- Locate concealed framing, blocking, and reinforcements that support paneling by field measurements before being enclosed and indicate measurements on Shop Drawings.
- Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating paneling without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.8 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that paneling can be installed as indicated.

PART 2 - PRODUCTS

2.1 BASIS OF DESIGN

A. Subject to compliance with requirements, provide Marlite; MAP375 or comparable product as approved by Architect.

2.2 HARDWARE

- Horizontal Main Rail support rail and vertical Cross Spline alignment framing.
 - 1. MAP375 NMR Narrow Main Rail, to create detailed 1/4" horizontal reveals. Furnished in full 8' (2.44m) lengths.
 - 2. MAP375 NCS Narrow Cross Spline, to create detailed 1/4" vertical reveals. Furnished cut-to-size to match panel.
- B. Panel Trim: Aluminum Profiles furnished in full 10' (3 meters) lengths including matching metal top, side, and bottom caps fastened with mated spline.

2.3 HARDWARE AND TRIM MATERIAL:

- A. Aluminum Heavy weight extruded aluminum 6063-T5 alloy and prefinished at the factory.
 - 1. Exposed Aluminum Clear satin anodized.

2.4 PANELS

A. Panel Configuration:

- 1. Face dimensions: [Nominal 24" (61cm) wide x 24" (61cm) high.] [As indicated on the drawings].
- 2. Panel thickness 3/8" (.95cm) thick.

- B. Marlite finish, direct digital printed and LPM or thermofused panels are typically manufactured using various wood fiber substrates having either 75%, 82% or 100 % recycled wood waste.
- C. Ultra-durable Solid Phenolic: Solid phenolic with decorative pattern or color on exposed face.
 - 1. Edges Square cut and kerfed on all edges, to accept hardware.
 - 2. Color: Wilsonart. Blond echo.
 - 3. Adhesive: Manufacturer's standard.

2.6 FABRICATION

- A. Framing, panels, hardware and accessories shall be factory finished and ready to install except for field fabrication as required by jobsite and perimeter conditions.
- B. Refinish field cut panel edges in accordance with manufacturer's instruction before installation.
- C. For cut-outs, drill corners for a minimum 1/8" radius.

2.7 INSTALLATION MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition paneling to average prevailing humidity conditions in installation areas.
- B. Before installing paneling, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Grade: Install paneling to comply with requirements for same grade specified in Part 2 for fabrication of type of paneling involved.
- B. Install paneling level, plumb, true, and straight with no distortions. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.

Install with no more than 1/16 inch in 96-inch vertical cup or bow and 1/8 inch in 96-inch horizontal variation from a true plane.

- For flush paneling with revealed joints, install with variations in reveal width, alignment of top and bottom edges, and flushness between adjacent panels not exceeding 1/32 inch.
- C. Scribe and cut paneling to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- D. Anchor paneling to supporting substrate with concealed panel-hanger clips. Do not use face fastening unless covered by trim.
- E. Complete finishing work specified in this Section to extent not completed at shop or before installation of paneling. Fill nail holes with matching filler where exposed. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are applied in shop.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective paneling, where possible, to eliminate functional and visual defects; where not possible to repair, replace paneling. Adjust for uniform appearance.
- B. Clean paneling on exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

SECTION 071100 - BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Cold-applied, emulsified-asphalt dampproofing applied to the following surfaces:
 - a. Exterior, below-grade surfaces of concrete and masonry foundation walls without occupied space at interior, and not indicated to receive waterproofing.
 - b. Back side of concrete and masonry retaining walls, below grade.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 071610 CRYSTALLINE WATERPROOFING for other waterproofing.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer recommendations for method of application, primer, number of coats, coverage or thickness, and protection course. Indicate special procedures and perimeter conditions requiring special attention.
- B. Material Certificates: For each product, signed by manufacturers.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain primary dampproofing materials and primers through one source from a single manufacturer. Provide secondary materials recommended by manufacturer of primary materials.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt dampproofing to be performed according to manufacturers' written instructions.
- B. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain ventilation until dampproofing has thoroughly cured.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Euclid Chemical Company.
 - 2. Henry Company.
 - 3. Karnak Corporation.
 - 4. Meadows, W. R., Inc.
 - 5. Sonneborn, Degussa Building Products.
 - 6. Tremco Inc.

2.2 BITUMINOUS DAMPPROOFING

A. Cold-Applied, Emulsified-Asphalt Dampproofing, Brush and Spray Coats: ASTM D 1227, Type III, Class 1.

2.3 MISCELLANEOUS MATERIALS

- A. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended by manufacturer.
- B. Asphalt-Coated Glass Fabric: ASTM D 1668, Type I.
- C. Mastics and related materials as recommended by manufacturer.
- D. Patching Compound: Manufacturer's fibered mastic of type recommended by dampproofing manufacturer.
- E. Protection Course: Multi-ply semi-rigid core composed of a mineral-fortified asphalt core formed between two outside layers of asphalt impregnated reinforced mats, manufactured in accordance with ASTM D 6506, 1/8 inch thick biodegradable hardboard.
- F. Drainage Board: Two-part prefabricated composite drain consisting of formed polystyrene or PVC dimpled core covered on one side with a polypropylene filter fabric, 1/4 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Applicator present, for compliance with requirements for surface smoothness and other conditions affecting performance of work.
 - 1. Proceed with dampproofing application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.
 - 2. Verify substrate surfaces are durable and free of matter detrimental to adhesion or application of dampproofing system.

3.2 PREPARATION

- A. Protection of Other Work: Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.
- B. Clean substrates of projections and substances detrimental to work; fill voids, seal joints, and apply bond breakers if any, as recommended by prime material manufacturer.
- C. Apply manufacturer approved patching compound for filling and patching tie holes, honeycombs, reveals, and other imperfections.

3.3 APPLICATION

- A. Comply with manufacturer's written recommendations unless more stringent requirements are indicated or required by Project conditions to ensure satisfactory performance of dampproofing.
 - Apply additional coats if recommended by manufacturer or required to achieve coverages indicated.
 - 2. Allow each coat of dampproofing to cure 24 hours before applying subsequent coats.
 - 3. Apply from finished-grade line to top of footing, extend over top of footing, and down a minimum of 6 inches over outside face of footing.
 - 4. Extend 12 inches onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.
 - 5. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where shown as "reinforced," by embedding an 8-inch- wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat required for embedding fabric is in addition to other coats required.
- B. On Concrete Foundations: Apply two brush or spray coats at not less than 1.5 gal./100 sq. ft. for first coat and 1 gal./100 sq. ft.. for second coat.
- C. On Backs of Concrete and Masonry Retaining Walls: Apply one brush or spray coat at not less than 1.25 gal./100 sq. ft.

3.4 INSTALLATION OF PROTECTION COURSE

- A. Install protection course over completed-and-cured dampproofing. Butt joints of adjacent panels and adhere with mastic. Comply with dampproofing material manufacturer's written recommendations for attaching protection course. Support protection course with spot application of trowel-grade mastic where not otherwise indicated. Place drainage panel directly over dampproofing, butt joints, place to encourage drainage downwards.
- B. Scribe and cut boards around projections, penetrations, and interruptions.

3.5 CLEANING

A. Remove dampproofing materials from surfaces not intended to receive dampproofing.

SECTION 071610 - CRYSTALLINE WATERPROOFING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Crystalline waterproofing for the following applications.
 - a. Sump pits.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 033000 CAST-IN-PLACE CONCRETE for concrete substrate and finishing concrete walls and slabs to receive waterproofing.
 - Section 042000 UNIT MASONRY for preparing concrete unit masonry walls to receive waterproofing.
 - 3. Section 079200 JOINT SEALANTS for elastomeric and preformed sealants in concrete and masonry walls and floors.

1.3 SUBMITTALS

A. Product Data: Include manufacturer's installation instructions and general recommendations for waterproofing applications, substrate preparation, project specific construction details, and material descriptions and installation instructions for crystalline waterproofing.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with application only when existing and forecasted weather conditions permit crystalline waterproofing to be performed according to manufacturer's written instructions and warranty requirements.
- B. Proceed with waterproofing work only after pipe sleeves, vents, curbs, inserts, drains, and other projections through the substrate to be waterproofed have been completed. Proceed only after

- concrete and masonry substrate defects, including honeycombs, voids, and cracks, have been repaired to provide a sound substrate free of forming materials, including reveal inserts.
- C. Ambient Conditions: Proceed with waterproofing work only if temperature is maintained at 40 deg F or above during work and cure period, and space is well ventilated and kept free of water.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of crystalline waterproofing that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure to maintain watertight conditions within specified warranty period.
 - 2. Warranty Period: Five years from date of Substantial Completion.

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, the following:
 - 1. Crystalline Waterproofing:
 - a. Anti-Hydro International, Inc.; Hydro Cap.
 - b. Conproco Corp.; Super Seal.
 - c. Tamms Industries, Inc.; Hey'Di K-11.
 - d. ThoRoc, Div. of ChemRex; Tegraproof.
 - e. Vandex International Ltd.; Vandex Super.
 - f. Xypex Chemical Corporation; Xypex. (Basis-of-Design)

2.2 MATERIALS

- A. Crystalline Waterproofing: A prepackaged, proprietary blend of Portland cement, specially treated sand, and active chemicals that, when mixed with water and applied, penetrates by capillary action into concrete or masonry and reacts chemically with free lime in the presence of water to develop crystalline growth within concrete or masonry capillaries to produce an impervious, dense, waterproof concrete or masonry with properties meeting or exceeding the following criteria:
 - 1. Permeability: 0 for water at 33 feet when tested according to CE CRD-C 48.
 - Compressive Strength: Minimum 3000 psi when tested according to ASTM C 109/C 109M.
- B. Patching Compound: Cementitious waterproofing and repair mortar for filling and patching tie holes, honeycombs, reveals, and other imperfections; with properties meeting or exceeding the following criteria:

- 1. Compressive Strength: 7600 psi at 28 days when tested according to ASTM C 109/C 109M.
- 2. Flexural Strength: 710 psi at 28 days when tested according to ASTM C 348.
- 3. Shrinkage: Minus 0.093 percent at 28 days and plus 0.073 percent at 90 days when tested according to ASTM C 596.
- C. Plugging Compound: Cementitious compound with hydrophobic properties; resistant to water and moisture but vapor permeable for all standard applications (vertical, overhead and horizontal surfaces not exposed to vehicular traffic); with properties meeting or exceeding the following criteria:
 - 1. Permeability: 30 feet when tested according to CE CRD-C 48.
 - 2. Compressive Strength: 6000 psi at 28 days when tested according to ASTM C 109/C 109M.
 - 3. Flexural Strength: 1000 psi at 28 days when tested according to ASTM C 348.
 - 4. Bond Strength: 300 psi at 14 days when tested according to ASTM C 321.
- D. Water: Potable.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Conditions: Examine substrates, with Applicator present, where waterproofing is to be applied.
 - 1. Proceed with application only after unsatisfactory conditions have been corrected.
 - 2. Notify Architect in writing of active leaks or structural defects that would affect system performance.

3.2 PREPARATION

- A. Protect other work from damage from cleaning, preparation, and application of crystalline waterproofing. Provide temporary enclosure to confine spraying operation and to ensure adequate ambient temperatures and ventilation conditions for application.
- B. Stop active water leaks according to waterproofing manufacturer's written instructions.
- C. Repair damaged or unsatisfactory concrete or masonry according to manufacturer's written instructions.
- D. Surface Preparation: Comply with waterproofing manufacturer's written instructions to remove efflorescence, chalk, dust, dirt, mortar spatter, grease, oils, curing compounds, and form-release agents to ensure that waterproofing bonds to concrete or masonry surfaces.
 - 1. Clean masonry surfaces according to ASTM D 4261.
 - a. Lightweight Concrete Masonry: Etch with 10 percent muriatic (hydrochloric) acid solution or abrade surface by wire brushing. Remove acid residue until pH readings of water after rinse are not more than 1.0 pH lower or 2.0 pH higher than pH of water before rinse.

- b. Medium- and Normal-Weight Concrete Masonry: Sandblast or bushhammer to a depth of 1/16 inch.
- 2. Clean concrete surfaces according to ASTM D 4258.
 - a. Scratch- and Float-Finished Concrete: Etch with 10 percent muriatic (hydrochloric) acid solution according to ASTM D 4260.
 - b. Prepare smooth-formed and trowel-finished concrete by mechanical abrading or abrasive-blast cleaning according to ASTM D 4259.
- 3. Concrete Joints: Clean reveals according to waterproofing manufacturer's written instructions.
- 4. Cracks: Clean and fill cracks according to waterproofing manufacturer's written instructions.

3.3 APPLICATION

- A. General: Comply with waterproofing manufacturer's written instructions for application.
 - 1. Dampen surface with water and maintain damp condition until applying waterproofing.
 - 2. Apply waterproofing to negative-side surfaces.
 - 3. Number of Coats: Two coats.
 - 4. Dampen surface between coats.
- B. Final Coat Finish: Smooth
- C. Moist-cure waterproofing for three days immediately after application has set, followed by two days of air drying as recommended in writing by manufacturer.
- D. Waterproofing Treatment Extensions: Extend waterproofing treatment as follows:
 - 1. Onto columns integral with treated walls.
 - 2. Onto every substrate in areas indicated for treatment, including pipe trenches, pits, and sumps.

3.4 CLEANING AND PROTECTION

- A. Protect applied crystalline waterproofing from rapid drying, severe weather exposure, and water accumulation. Maintain completed Work in moist condition for not less than three days by procedures recommended in writing by waterproofing manufacturer. Protect waterproofing from temperatures below 36 deg F.
- B. Cleaning: Clean spillage and soiling from adjacent surfaces using appropriate cleaning agents and procedures.
- C. Protection: Take measures to protect completed crystalline waterproofing coating from damage after application.

3.5 FIELD QUALITY CONTROL

A. Inspection: Engage manufacturer's representative to inspect completed application and to provide a written report that application complies with manufacturer's written instructions.

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SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Rigid insulation under slabs-on-grade and at perimeter foundation walls.
 - 2. Rigid insulation at cavity walls.
 - 3. Spray foam for gaps and voids.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 033000 CAST-IN-PLACE CONCRETE for underslab vapor barrier.
 - 2. Section 072700 AIR BARRIERS for air and vapor barrier membrane.
 - 3. Section 075300 EPDM MEMBRANE ROOFING for roofing insulation.
 - Section 092110 GYPSUM BOARD ASSEMBLIES for acoustic insulation in gypsum board assemblies.
 - 5. Division 22 PLUMBING for plumbing insulation.
 - 6. Division 23 HEATING, VENTILATING, AND AIR CONDITIONING for mechanical insulation.

1.3 SUBMITTALS

- A. Product Data: Manufacturer product data, installation instructions, performance criteria, and product limitations for each type of product indicated.
- B. Cavity Wall Insulation Certification: Submit manufacturer's certification that cavity wall insulation, as designed in the assemblies indicated on the Drawings, has been tested to meet the requirements of NFPA 285 and passed.
- C. Qualification Data: For Installer of spray-applied products and Testing Agency.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of building insulation through one source from a single manufacturer.
- B. Installer Qualifications: A qualified installer who has been trained by and is acceptable to spray polyurethane foam insulation manufacturer to install manufacturer's products.

- C. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- D. Fire Test Performance for Insulation in Cavity Wall: Passes NFPA 285, Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.
- E. Testing Agency Qualifications: An independent agency qualified as a "Certified Infrared Thermographer" per ASNT SNT-TC-1A guidelines, Level I certification minimum.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store in a dry and secure location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.1 FOUNDATION WALL AND UNDER SLAB INSULATION

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. DuPont (formerly Dow Chemical); Reduced GWP Styrofoam series (gray color).
 - 2. Kingspan: Greenquard XPS LG series.
 - 3. Owens Corning; Foamular NGX (Next Generation Extruded) series.
- B. Extruded-Polystyrene (XPS) Board Insulation: ASTM C 578, square edged of type, density, and compressive strength indicated below:
 - 1. For vertical applications, Type IV, 1.6-lb/cu. ft. minimum density and 25-psi minimum compressive strength.
 - 2. For horizontal applications, pedestrian traffic, Type VII, 2.2-lb/cu. ft. minimum density and 60-psi minimum compressive strength.
 - 3. For horizontal applications, vehicular traffic, Type V, 3-lb/cu. ft. minimum density and 100-psi minimum compressive strength.
 - 4. Thermal Resistivity (R-value): 5.0 per inch.
 - 5. Blowing Agent: Honeywell; Solstice Liquid Blowing Agent, low global warming potential (GWP) hydrofluoro-olefin (HFO), or approved equal.
 - a. Other insulation manufacturers may be considered, if they have adopted the HFO blowing agents by start of construction.
 - 6. Recycled Content: 20 percent min.
- C. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.

2.2 CAVITY WALL INSULATION, POLYISOCYANURATE BOARD

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Atlas Roofing Corp.
 - 2. Dow Chemical Company.
 - Rmax Inc.
- B. Foil-Faced, Polyisocyanurate Board Insulation: ASTM C 1289, Type I, Class 1 or 2, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84; 25-psi minimum compressive strength.
 - 1. Fire Resistance: NFPA 286, for interior walls.
 - 2. Thermal Resistance: ASTM C 518, R-Value 6.5 per inch.
 - 3. Blowing Agent: Free from CFCs, HCFCs, or HFCs.
- C. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.
- D. Joint Tape: Provide manufacturer's recommended foil tape, as approved by the Architect.

2.3 CAVITY WALL INSULATION, MINERAL-WOOL BOARD

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Isolatek International.
 - 2. Owens Corning; Thermafiber.
 - 3. Rockwool (formerly Roxul).
- B. Unfaced, Mineral-Wool Board Insulation: ASTM C 612, Type IVB; with maximum flame-spread and smoke-developed indexes of 15 and zero, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
 - 1. Nominal density of 4 lb/cu. ft. Types IA and IB, thermal resistivity of 4 deg F x h x sq. ft./Btu x in. at 75 deg F minimum.
 - 2. Fiber Color: Natural, except darkened where visible through joints in cladding.
 - 3. NFPA 285 Assembly Fire Propagation Characteristics Testing Results: Passing.
 - 4. Building Product Disclosure and Optimization, Environmental Product Declarations (EPD): Industry-wide EPD.
- C. Attachment to Substrate, Masonry Veneers: Manufacturer's recommended mechanical attachment clip or disk.
- D. Attachment to Substrate, Panel Veneers: Manufacturer's recommended adhesively attached, spindle-type insulation anchors.

2.4 SPRAYED-FOAM INSULATION, AT GAPS AND VOIDS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

- Dow Chemical; GreatStuff Pro.
- 2. ICP Adhesives and Sealants (formerly Fomo Products): Handi-Foam products.
- 3. Approved equal.
- B. Sprayed-Foam Insulation: Water-cure closed cell polyurethane containing no ureaformaldehyde and no CFCs.
 - 1. Minimum density of 0.4 lb/cu. ft., thermal resistivity of 4.0 deg F x h x sq. ft./Btu x in. at 75 deg F.
 - 2. Fire Resistance: UL 723, Flame Spread 25 max., and Smoke Developed 50 max.
 - 3. Building Product Disclosure and Optimization, Environmental Product Declarations (EPD): Industry-wide EPD.
 - 4. Low-Emitting Materials, General Emissions Evaluation: GreenGuard Gold certification.

2.5 AUXILIARY INSULATING MATERIALS

- A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.
 - Low-Emitting Materials: Provide interior adhesives in compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - 2. Do not use adhesives that contain urea formaldehyde.
 - 3. Methylene chloride and perchloroethylene may not be intentionally added to adhesives.
- B. Masonry and Concrete Fasteners:
 - 1. Hardened nails, pneumatically-driven fasteners or other anchors recommended by insulation manufacturer, sufficient to penetrate substrate and permanently retain insulation.
 - 2. Self-adhering insulation stick pins: Galvanized steel plate welded to projecting steel spindle; capable of holding insulation thicknesses indicated securely in position indicated with self-locking galvanized steel washer in place. Backseal fastener penetrations.
- C. Tape: Adhesive tape recommended by insulation manufacturer, to tape joints and tears in faced insulation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and for other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of substances harmful to insulation including removing projections capable of interfering with insulation attachment.

3.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.
- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Miscellaneous Voids: Install spray polyurethane foam insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation.
 - 1. Cure insulation with continuous natural or mechanical ventilation.
 - 2. Remove and dispose of over-spray.

3.4 INSTALLATION OF BELOW-GRADE INSULATION

- A. On vertical surfaces, set rigid insulation units in adhesive applied according to manufacturer's written instructions. Use adhesive recommended by insulation manufacturer.
 - 1. If not otherwise indicated, extend insulation a minimum of 48 inches below exterior grade line.
- B. On horizontal surfaces, loosely lay rigid insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

3.5 INSTALLATION OF CAVITY-WALL INSULATION

- A. On units of foam-plastic board insulation, install pads of adhesive spaced approximately 24 inches o.c. both ways on inside face, and as recommended by manufacturer. Fit courses of insulation between wall ties (if applicable) and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates indicated. Fill gaps with compatible insulating material.
- B. Install mineral wool board cavity insulation per manufacturer's instructions. Fit insulation with edges butted tightly in both directions. Do not compress insulation. Maintain cavity width of dimension indicated between insulation and cladding material.
 - 1. Masonry Veneers: Secure with clips installed over masonry anchors. Provide at least 6 clips per mineral wool board.
 - 2. Panel Veneers: Secure with adhesively attached, spindle-type insulation anchors. Space anchors according to insulation manufacturer's written instructions.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections indicated below and prepare test reports.

- B. Infrared Camera Survey: Perform an infrared camera scan of walls, floors, and ceilings to determine where insulation and air barrier are not continuous, after insulation has been installed, but prior to plaster patching or new gypsum board installation.
 - 1. Provide complete digital report with images of test results with recommendations for repairs.
- C. Repair or replace work where test results and inspections indicate that it does not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.7 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

SECTION 072160 - STRUCTURAL THERMAL BREAK SYSTEM

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Structural thermal breaks.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - Section 033000 CAST-IN-PLACE CONCRETE for coordination with concrete.
 - 2. Section 042000 UNIT MASONRY for coordination with masonry construction.
 - 3. Section 051200 STRUCTURAL STEEL FRAMING for coordination with framing.
 - 4. Section 072100 THERMAL INSULATION for building insulation.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions.
- B. Schedule: Submit a list of locations where structural thermal breaks are to be used, and the specific product and thickness to be used at each location.
- C. Shop Drawings: Submit shop drawings showing details of construction, and relationship of structural thermal break material with adjacent construction including fastening and/or anchorage connection details, Armatherm thermal break material size and thickness.
- D. Thermal Design: Wall assembly or interface detail shall meet the ASHRAE 90.1 requirements for continuous insulation and shall not have structural connections (beams, support framing, sub girts, clips) which create thermal bridging. Effective U values of wall, roof and foundation assemblies shall meet or exceed the design requirements per code. Effective U value calculation or modeling shall be performed in accordance with ASHRAE guidelines.
- E. Structural Design: Design structural thermal break connections and/or façade attachment support framing using performance requirements and design criteria indicated. Provide comprehensive engineering analysis by a qualified professional engineer.

1.4 QUALITY ASSURANCE

A. Manufacturer: Minimum of 5 years' experience producing similar products.

- B. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
 - B. Storage and Handling: Comply with manufacturer's recommendations for storage and handling. Protect from weather damage.
- 1.6 WARRANTY
 - A. Warranty: Provide manufacturer's standard limited warranty against defects in manufacturing.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Manufacturer: Fabreeka International, Inc., 1023 Turnpike Street, Stoughton, Massachusetts 02072. Toll Free 800-322-7352. Phone 781-341-3655. Fax 781-341-3983. www.fabreeka.com. info@fabreeka.com.
- B. Substitutions: Comply with Division 01.
- C. Single Source: Provide materials from single manufacturer.
- 2.2 STRUCTURAL THERMAL BREAKS: "FABREEKA-TIM".
 - A. Description:
 - Load-bearing, structural thermal break/insulation material to prevent thermal bridging between flanged, bolted, structural steel framing members at connections.
 - 2. Maintains structural integrity of connections while reducing energy loss.
 - B. Material: Fiberglass-reinforced laminate composite.
 - C. ICC Certified:
 - 1. US: ESL-1164.
 - 2. Canada: ESL-1165.
 - D. RoHS II compliant.
 - E. Thickness: 2 inches (50.8 mm), unless otherwise indicated on drawings.
 - F. Ultimate Mechanical Properties, Nominal:
 - 1. Tensile Strength, ASTM D 638: 11,000 psi (75.8 MPa).
 - 2. Flexural Strength, ASTM D 790: 25,000 psi (172.4 MPa).
 - 3. Compressive Strength, ASTM D 695: 38,900 psi (268.2 MPa).
 - 4. Compressive Modulus, ASTM D 695:

- a. 1/2-Inch (12.7 mm) Thickness: 291,194 psi (2,007.7 MPa).
- b. 1-Inch (25.4 mm) Thickness: 519,531 psi (3,582.0 MPa).
- 5. Shear Strength, ASTM D 732: 15,000 psi (103.4 MPa).
- 6. Operating Temperature Range: Minus 20 degrees F to 250 degrees F (Minus 29 degrees C to 121 degrees C).
 - a. Loss in Ultimate Strength at 250 degrees F (121 degrees C): 30 percent.
- G. Flame Resistance, Nominal:
 - Oxygen Index, ASTM D 2863: 21.8 percent.
- H. Thermal Properties, Nominal:
 - 1. Coefficient of Thermal Expansion, ASTM D 696: 2.2 in/in/degree C x 10⁻⁵.
 - 2. Thermal Conductivity, ASTM C 177: 1.8 BTU/hr/ft²/in/degree F (0.259 W/m* degree K).
 - 3. Heat Flow Resistance, R-Value:
 - a. 1/4-Inch (6.4 mm) Thickness: 0.14.
 - b. 1/2-Inch (12.7 mm) Thickness: 0.28.
 - c. 1-Inch (25.4 mm) Thickness: 0.56.
- I. Density: 107.83 pcf (1,727 kg/m³).
- J. Coefficient of Friction:
 - 1. "Fabreeka-TIM" to Steel:
 - a. Compression Load 5,000 psi (34.5 MPa): 0.27 µs.
 - b. Compression Load 10,000 psi (69 MPa): 0.26 µs.
- 2.3 THERMAL BREAK WASHERS: "FABREEKA-TIM" WASHERS.
 - A. Material: Same as "Fabreeka-TIM" structural thermal break plates.
 - B. Thickness: 1/4 inch (6.4 mm).
 - C. OD and ID: Determined by structural bolt diameter. Refer to Recommended Washer and Bushing Sizes in manufacturer's product data.
- 2.4 THERMAL BREAK BUSHINGS: "FABREEKA" BUSHINGS.
 - A. Material: Elastomeric material.
 - B. Length: Determined by thickness of steel end plate.
 - C. OD and ID: Determined by structural bolt diameter. Refer to Recommended Washer and Bushing Sizes in manufacturer's product data.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install thermal breaks in accordance with manufacturer's instructions and approved submittals and the following:
 - 1. Install in proper relationship with adjacent materials.
 - 2. Include accessory products including bushings and washers.
 - 3. Protect from damage until acceptance.

END OF SECTION

SECTION 072419 - EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Water-drainage, polymer-based exterior insulation and finish system (EIFS) including, but not limited to, the following components:
 - Water-resistive, water-vapor-impermeable air barrier applied over sheathing.
 - b. Flexible flashing.
 - c. Adhesive; vertically "channeled" to permit water drainage.
 - d. Expanded pollystyrene insulation, typically 2 inches thick.
 - e. Reinforcing mesh.
 - f. Finish coat.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 061600 SHEATHING for sheathing substrate.
 - 2. Section 076200 SHEET METAL FLASHING AND TRIM for metal flashing.
 - 3. Section 079200 JOINT SEALANTS for sealing joints in EIFS with elastomeric joint sealants.

1.3 COORDINATION

A. Coordinate installation of EIFS with related Work specified in other Sections to ensure that wall assemblies, including sheathing, flashing, trim, joint sealants, windows, and doors, are protected against damage from the effects of weather, age, corrosion, moisture, and other causes. Do not allow water to penetrate behind flashing and barrier coating of EIFS.

1.4 SYSTEM DESCRIPTION

A. Class PB EIFS: A non-load-bearing, exterior wall cladding system that consists of an insulation board attached adhesively, mechanically, or both to the substrate; an integrally reinforced base coat; and a textured protective finish coat.

B. Water-Drainage EIFS: EIFS with a means that allows water entering into an EIFS assembly to drain to the exterior.

1.5 PERFORMANCE REQUIREMENTS

- A. EIFS Performance: Comply with the following:
 - 1. Bond Integrity: Free from bond failure within EIFS components or between system and supporting wall construction, resulting from exposure to fire, wind loads, weather, or other in-service conditions.
 - 2. Weathertightness: Resistant to water penetration from exterior into EIFS and assemblies behind it or through them into interior of building that results in deterioration of thermal-insulating effectiveness or other degradation of EIFS and assemblies behind it, including substrates, supporting wall construction, and interior finish.

1.6 SUBMITTALS

- A. Product Data: For each type and component of EIFS indicated.
- B. Shop Drawings: For EIFS. Include plans, elevations, sections, details of components, details of penetration and termination, flashing details, joint locations and configurations, fastening and anchorage details including mechanical fasteners, and connections and attachments to other work.
- C. Samples for Verification: 24-inch- square panels for each type of finish-coat color and texture indicated, prepared using same tools and techniques intended for actual work including custom trim, each profile, an aesthetic reveal, a typical control joint filled with sealant of color selected.
 - Include sealants and exposed accessory Samples to verify color selected.
- D. Qualification Data: For Installer and testing agency.
- E. Manufacturer Certificates: Signed by manufacturers certifying that EIFS comply with requirements.
- F. Material or Product Certificates: For each insulation and joint sealant, from manufacturer.
- G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each insulation, reinforcing mesh, and coating.
- H. Field quality-control reports.
- I. Maintenance Data: For EIFS to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An installer who is certified in writing by EIFS manufacturer as qualified to install manufacturer's system using trained workers. Installer shall possess a current manufacturer's certificate of education and be experienced and competent in installation of plaster-like materials.
 - Fabricator/Erector Qualifications: Certified in writing by EIFS manufacturer as qualified to fabricate and erect manufacturer's prefabricated panel system using skilled and trained workers.
- B. Source Limitations: Obtain EIFS from single source from single EIFS manufacturer and from sources approved by EIFS manufacturer as compatible with system components.
- C. Regulatory Requirements: Insulation Board must be produced and labeled under a third party quality program as required by applicable building codes.
- D. Fire-Test-Response Characteristics: Provide EIFS and system components with the following fire-test-response characteristics as determined by testing identical EIFS and system components per test method indicated below by IBC. Identify products with appropriate markings of applicable code.
 - 1. Fire-Resistance Characteristics: Provide materials and construction tested for fire resistance per ASTM E 119.
 - 2. Intermediate-Scale Multistory Fire Test: Tested mockup, representative of completed multistory wall assembly of which EIFS is a part, complies with NFPA 285 for test method and required fire-test-response characteristics of exterior non-load-bearing wall panel assemblies containing foam-plastic insulation.
 - 3. Radiant Heat Exposure: No ignition of EIFS when tested according to NFPA 268.
 - 4. Surface-Burning Characteristics: Provide insulation board, adhesives, base coats, and finish coats with flame-spread index of 25 or less and smokedeveloped index of 450 or less, per ASTM E 84.
- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution and set quality standards for fabrication and installation.
 - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- F. Preinstallation Conference: Conduct conference at Project site.
- 1.8 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver materials in original, unopened packages with manufacturers' labels intact and clearly identifying products.

- B. Store materials in a cool location, inside and under cover and at a temperature above 40°F (4°C) and below 110°F (43°C); keep them dry and protected from weather, direct sunlight, surface contamination, aging, corrosion, damaging temperatures, construction traffic, and other causes, and in accordance with manufacturer's instructions.
 - 1. Stack insulation board flat and off the ground.
 - Protect plastic insulation against ignition at all times. Do not deliver plastic 2. insulating materials to Project site before installation time.
 - Complete installation and concealment of plastic materials as rapidly as possible 3. in each area of construction.

1.9 PROJECT CONDITIONS

Α. Weather Limitations: Maintain ambient temperatures above 40 deg F for a minimum of 24 hours before, during, and after adhesives or coatings are applied. Do not apply EIFS adhesives or coatings during rainfall. Proceed with installation only when existing and forecasted weather conditions and ambient outdoor air, humidity, and substrate temperatures permit EIFS to be applied, dried, and cured according to manufacturers' written instructions and warranty requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design: Dryvit Outsulation Plus MD or comparable product as approved by Architect.

2.2 **MATERIALS**

- Compatibility: Provide water-resistive coating, adhesive, fasteners, board insulation, Α. reinforcing meshes, base- and finish-coat systems, sealants, and accessories that are compatible with one another and with substrates and approved for use by EIFS manufacturer for Project.
- B. Water-Resistive Coatings: EIFS manufacturer's standard formulation and accessories for use as water/weather-resistive barriers, compatible with substrate, and complying with physical and performance criteria of ICC-ES AC209.
 - Sheathing Joint Compound and Tape: 1. Type recommended by EIFS manufacturer for sealing joints between and penetrations through sheathing.
- C. Primer/Sealer: EIFS manufacturer's standard substrate conditioner designed to seal substrates from moisture penetration and to improve the bond between substrate of type indicated and adhesive used for application of insulation.
- Cold-applied, fully self-adhering, D. Flexible-Membrane Flashing: self-healing, rubberized-asphalt and polyethylene-film composite sheet or tape and primer; EIFS manufacturer's standard or product recommended in writing by EIFS manufacturer.

- E. Insulation Adhesive: EIFS manufacturer's standard formulation designed for indicated use; compatible with substrate.
- F. Molded, Rigid Cellular Polystyrene Board Insulation: Comply with ASTM C 578, Type I; EIFS manufacturer's requirements; and EIMA's "EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board" for most stringent requirements for material performance and qualities of insulation, including dimensions and permissible variations, and the following:
 - 1. Thickness: As indicated on Drawings.
 - 2. Aging: Before cutting and shipping, age insulation in block form by air drying for not less than six weeks or by another method approved by EIMA that produces equivalent results.
 - 3. Flame-Spread and Smoke-Developed Indexes: 25 and 450 or less, respectively, per ASTM E 84.
 - 4. Dimensions: Provide insulation boards not more than 24 by 48 inches and in thickness indicated, but not more than allowed in the EIFS manufacturer's current ICC Evaluation Service Report.
 - 5. Foam Shapes: Provide with profiles and dimensions indicated on Drawings.
- G. Reinforcing Mesh: Balanced, alkali-resistant, open-weave, glass-fiber mesh treated for compatibility with other EIFS materials, made from continuous multiend strands with retained mesh tensile strength of not less than 120 lbf/in. per ASTM E 2098; complying with ASTM D 578 and the following:
 - 1. Standard-Impact Reinforcing Mesh: Not less than 4.5 oz./sq. yd.
 - 2. Intermediate-Impact Reinforcing Mesh: Not less than 12.0 oz./sq. yd.
 - 3. High-Impact Reinforcing Mesh: Not less than 15 oz./sq. yd.
 - 4. Detail Reinforcing Mesh: Not less than 4.2 oz./sq. yd.
 - 5. Corner Reinforcing Mesh: Not less than 9.0 oz./sq. yd.
- H. Base-Coat Materials: EIFS manufacturer's standard mixture complying with the following:
 - 1. Factory-blended dry formulation of portland cement, dry polymer admixture, and inert fillers to which only water is added at Project site.
- I. Waterproof Adhesive/Base-Coat Materials: EIFS manufacturer's standard waterproof formulation and complying with the following:
 - 1. Job-combined formulation of manufacturer's standard polymer-emulsion adhesive and manufacturer's standard dry mix containing portland cement.
 - 2. Project Locations: Provide for base coat over foundations, parapets, splash areas trim and other projecting features.
- J. Primer: EIFS manufacturer's standard factory-mixed, elastomeric-polymer primer for preparing base-coat surface for application of finish coat.

- K. Finish-Coat Materials: EIFS manufacturer's standard acrylic-based coating with enhanced mildew resistance, complying with the following:
 - 1. Factory-mixed formulation of polymer-emulsion binder, colorfast mineral pigments, sound stone particles, and fillers.
 - 2. Colors: As selected by Architect from manufacturer's full range.
- L. Water: Potable.
- M. Trim Accessories: Type as designated or required to suit conditions indicated and to comply with EIFS manufacturer's written instructions; manufactured from UV-stabilized PVC; and complying with ASTM D 1784, manufacturer's standard Cell Class for use intended, and ASTM C 1063.
 - Weep Screed/Track: Prefabricated, one-piece type for attachment behind insulation with perforated face leg extended to form a drip and weep holes in track bottom, of depth required to suit thickness of coating and insulation, with face leg perforated for bonding to coating and back leg; designed to drain incidental moisture that gets into wall construction to the exterior at terminations of EIFS with drainage.
 - 2. Expansion Joint: Prefabricated, one-piece V profile; designed to relieve stress of movement.

2.3 ELASTOMERIC SEALANTS

A. Refer to Section 079200 - JOINT SEALANTS for sealing joints in EIFS with elastomeric joint sealants.

2.4 MIXING

A. General: Comply with EIFS manufacturer's requirements for combining and mixing materials. Do not introduce admixtures, water, or other materials except as recommended by EIFS manufacturer. Mix materials in clean containers. Use materials within time period specified by EIFS manufacturer or discard.

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 EIFS.
- B. Examine roof edges, wall framing, flashings, openings, substrates, and junctures at other construction for suitable conditions where EIFS will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Begin coating application only after surfaces are dry.

2. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Protect contiguous work from moisture deterioration and soiling caused by application of EIFS. Provide temporary covering and other protection needed to prevent spattering of exterior finish coats on other work.
- B. Protect EIFS, substrates, and wall construction behind them from inclement weather during installation. Prevent penetration of moisture behind EIFS and deterioration of substrates.
- C. Prepare and clean substrates to comply with EIFS manufacturer's written instructions to obtain optimum bond between substrate and adhesive for insulation.

3.3 EIFS INSTALLATION, GENERAL

A. Comply with EIFS manufacturer's written instructions for installation of EIFS as applicable to each type of substrate indicated.

3.4 SUBSTRATE PROTECTION APPLICATION

- A. Primer/Sealer: Apply over gypsum sheathing substrates to protect substrates from degradation and where required by EIFS manufacturer for improving adhesion of insulation to substrate.
- B. Water-Resistive Coatings: Apply over substrates to protect substrates from degradation and to provide water-/weather-resistive barrier and air barrier.
 - 1. Tape and seal joints, exposed edges, terminations, and inside and outside corners of sheathing unless otherwise indicated by EIFS manufacturer's written instructions.
- C. Flexible-Membrane Flashing: Install over weather-resistive barrier, applied and lapped to shed water; seal at openings, penetrations, terminations, and where indicated by EIFS manufacturer's written instructions to protect wall assembly from degradation. Prime substrates, if required, and install flashing to comply with EIFS manufacturer's written instructions and details.

3.5 TRIM INSTALLATION

- A. Trim: Apply trim accessories at perimeter of EIFS, at expansion joints, and elsewhere as indicated, according to EIFS manufacturer's written instructions. Coordinate with installation of insulation.
 - 1. Weep Screed/Track: Use at bottom termination edges, at window and door heads, and at floor line expansion joints of water-drainage EIFS unless otherwise indicated
 - 2. Expansion Joint: Use where indicated on Drawings.

3. Other Trim: Use where indicated on Drawings.

3.6 INSULATION INSTALLATION

- A. Board Insulation: Adhesively attach insulation to substrate in compliance with ASTM C 1397, EIFS manufacturer's written instructions, and the following:
 - 1. Apply adhesive to in vertical "channels" in accordance with EIFS manufacturer's written instructions to permit drainage to base flashing. Apply adhesive channels in thickness as recommended by the manufacturer for application.
 - 2. Press and slide insulation into place to provide uniform contact with all adhesive channels while maintaining space between channels to permit drainage.
 - 3. Allow adhered insulation to remain undisturbed for period recommended by EIFS manufacturer, but not less than 24 hours, before beginning rasping and sanding insulation, or applying base coat and reinforcing mesh.
 - 4. Apply insulation over dry substrates in courses with long edges of boards oriented horizontally.
 - 5. Begin first course of insulation from screed/track and work upward. Work from perimeter casing beads toward interior of panels if possible.
 - 6. Stagger vertical joints of insulation boards in successive courses to produce running bond pattern. Locate joints so no piece of insulation is less than 12 inches wide or 6 inches high. Offset joints not less than 6 inches from corners of window and door openings and not less than 4 inches from aesthetic reveals.
 - a. Adhesive Attachment: Offset joints of insulation not less than 6 inches from horizontal and 4 inches from vertical joints in sheathing.
 - 7. Interlock ends at internal and external corners.
 - 8. Abut insulation tightly at joints within and between each course to produce flush, continuously even surfaces without gaps or raised edges between boards. If gaps greater than 1/16 inch occur, fill with insulation cut to fit gaps exactly; insert insulation without using adhesive or other material.
 - 9. Cut insulation to fit openings, corners, and projections precisely and to produce edges and shapes complying with details indicated.
 - 10. Rasp or sand flush entire surface of insulation to remove irregularities projecting more than 1/32 inch (0.8 mm) from surface of insulation and to remove yellowed areas due to sun exposure; do not create depressions deeper than 1/16 inch (1.6 mm). Prevent airborne dispersal and immediately collect insulation raspings or sandings.Cut aesthetic reveals in outside face of insulation with high-speed router and bit configured to produce grooves, rabbets, and other features that comply with profiles and locations indicated. Do not reduce insulation thickness at aesthetic reveals to less than 3/4 inch.
 - 11. Interrupt insulation for expansion joints where indicated.
 - 12. Form joints for sealant application by leaving gaps between adjoining insulation edges and between insulation edges and dissimilar adjoining surfaces. Make gaps wide enough to produce joint widths indicated after encapsulating joint substrates with base coat and reinforcing mesh.
 - 13. After installing insulation and before applying reinforcing mesh, fully wrap board edges with strip reinforcing mesh. Cover edges of board and extend

encapsulating mesh not less than 2-1/2 inches over front and back face unless otherwise indicated on Drawings.

- 14. Treat exposed edges of insulation as follows:
 - a. Except for edges forming substrates of sealant joints, encapsulate with base coat, reinforcing mesh, and finish coat.
 - b. Encapsulate edges forming substrates of sealant joints within EIFS or between EIFS and other work with base coat and reinforcing mesh.
 - c. At edges trimmed by accessories, extend base coat, reinforcing mesh, and finish coat over face leg of accessories.
- Coordinate installation of flashing and insulation to produce wall assembly that does not allow water to penetrate behind flashing and EIFS protective-coating lamina.
- B. Expansion Joints: Install at locations indicated, where required by EIFS manufacturer, and as follows:
 - 1. At expansion joints in substrates behind EIFS.
 - 2. Where EIFS adjoin dissimilar substrates, materials, and construction, including other EIFS.
 - 3. At floor lines in multilevel wood-framed construction.
 - 4. Where wall height or building shape changes.
 - 5. Where EIFS manufacturer requires joints in long continuous elevations.

3.7 BASE-COAT INSTALLATION

- A. Waterproof Adhesive/Base Coat: Apply over sloped surfaces, window sills, parapets, and where indicated on Drawings to protect substrates from degradation.
- B. Base Coat: Apply to exposed surfaces of insulation and foam shapes in minimum thickness recommended in writing by EIFS manufacturer, but not less than 1/16-inch dry-coat thickness.
- C. Reinforcing Mesh: Embed type indicated in wet base coat to produce wrinkle-free installation with mesh continuous at corners and overlapped not less than 2-1/2 inches or otherwise treated at joints to comply with ASTM C 1397 and EIFS manufacturer's written instructions. Do not lap reinforcing mesh within 8 inches of corners. Completely embed mesh, applying additional base-coat material if necessary, so reinforcing-mesh color and pattern are not visible.
- D. Double-Layer Reinforcing Mesh Application: Where indicated, apply second base coat and second layer of intermediate-impact reinforcing mesh, overlapped not less than 2-1/2 inches or otherwise treated at joints to comply with ASTM C 1397 and EIFS manufacturer's written instructions in same manner as first application. Do not apply until first base coat has cured.
- E. Additional Reinforcing Mesh: Apply strip reinforcing mesh around openings extending 4 inches beyond perimeter. Apply additional 9-by-12-inch strip reinforcing mesh

diagonally at corners of openings (re-entrant corners). Apply 8-inch- wide strip reinforcing mesh at both inside and outside corners unless base layer of mesh is lapped not less than 4 inches on each side of corners.

- 1. At aesthetic reveals, apply strip reinforcing mesh not less than 8 inches wide.
- 2. Embed strip reinforcing mesh in base coat before applying first layer of reinforcing mesh.
- F. Foam Shapes: Fully embed reinforcing mesh in base coat.
- G. Double Base-Coat Application: Where indicated, apply second base coat in same manner and thickness as first application except without reinforcing mesh. Do not apply until first base coat has cured.

3.8 FINISH-COAT INSTALLATION

- A. Primer: Apply over dry base coat according to EIFS manufacturer's written instructions.
- B. Finish Coat: Apply over dry primed base coat, maintaining a wet edge at all times for uniform appearance, in thickness required by EIFS manufacturer to produce a uniform finish of color and texture matching approved sample and free of cold joints, shadow lines, and texture variations.
 - 1. Texture: As indicated by manufacturer's designations on approved Shop Drawings.

3.9 INSTALLATION OF JOINT SEALANTS

A. Refer to Section 079200 - JOINT SEALANTS for sealing joints in EIFS with elastomeric joint sealants.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency for Field Testing: Owner will engage a qualified testing agency to perform tests and inspections.
- B. EIFS Tests and Inspections: According to ASTM E 2273 "Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies."
- C. Remove and replace EIFS where test results indicate that EIFS do not comply with specified requirements.
- D. Prepare test and inspection reports.

3.11 CLEANING AND PROTECTION

A. Remove temporary covering and protection of other work. Promptly remove coating materials from window and door frames and other surfaces outside areas indicated to receive EIFS coatings.

END OF SECTION

SECTION 072600 - VAPOR RETARDER

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Vapor retarders under slabs-on-grade.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 033000 CAST-IN-PLACE CONCRETE.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.1 VAPOR RETARDER

- A. Basis-of-Design: Stego Wrap Vapor Retarder by Stego Industries LLC, or Perminator by W.R. Meadows, or Viper VaporCheck II 15 mil by ISI Building Products. Vapor retarder shall have the following qualities:
 - 1. Permeance of less than 0.01 perms per ASTM F 1249 or ASTM E 96.
 - 2. ASTM E 1745 Class A, with the permeance requirement modified to not exceed 0.01 perms both before and after conditioning.
 - 3. Thickness: 15 mils.

B. Accessories:

- 1. Seam Tape: Permeance less than 0.3 perms per ASTM F 1249 or ASTM E 96.
- 2. Vapor Proofing Mastic: Permeance less than 0.3 perms per ASTM F 1249 or ASTM E 96.

3. Pipe Boots: Construct pipe boots from vapor retarder material, pressure sensitive tape and/or mastic per manufacturer's instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and for other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances harmful to vapor retarders, including removing projections capable of puncturing vapor retarders.
- 3.3 INSTALLATION, GENERAL
 - A. Comply with manufacturer's written instructions.

3.4 PROTECTION

A. Protect installed vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes.

END OF SECTION

SECTION 072700 - AIR BARRIERS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Fluid-applied, vapor-permeable membrane air barrier
 - 2. Transition strips to adjacent and penetrating materials.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 042000 UNIT MASONRY for substrate for air and vapor barrier system.
 - 2. Section 061600 SHEATHING for sheathing substrate for air and vapor barrier system.
 - 3. Section 075300 EPDM MEMBRANE ROOFING for connection to roof air and vapor barrier.
 - 4. Section 079200 JOINT SEALANTS for joint sealant requirements.

1.3 DEFINITIONS

A. Air Barrier Assembly: The collection of air barrier materials and auxiliary materials applied to an opaque wall or soffit, including joints and junctions to abutting construction, to control air movement through the wall.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Air barrier shall be capable of performing as a continuous vapor-retarding air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air Barrier Assembly Air Leakage: Not to exceed 0.03 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., ASTM E 2357.
- C. Fire Test Performance: Passes NFPA 285, Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

1.5 PRECONSTRUCTION TESTING

- A. Mockup Testing: Air barrier assemblies shall comply with performance requirements indicated, as evidenced by reports based on mockup testing by a qualified testing agency.
 - 1. The Owner may engage a qualified testing agency.
 - 2. Quantitative Air Leakage Testing: Testing of the mockup for air leakage will be conducted not to exceed the test pressure differential, positive and negative, indicated in "Performance Requirements" Article for air barrier assembly air leakage when tested according to ASTM E 783.
 - 3. Notify Architect and the Owner a minimum of seven days in advance of the dates and times when mockup testing will take place.

1.6 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of air barrier.
- B. Shop Drawings: Show locations and extent of air barrier. Include details for substrate joints and cracks, counterflashing strip, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
 - 1. Include details of interfaces with other materials that form part of air barrier.
 - 2. Include details of mockups.
- C. Product Certificates: For air barriers, certifying compatibility of air barrier and accessory materials with Project materials that connect to or that come in contact with air barrier; signed by product manufacturer.
- D. Air Barrier Certification: Submit manufacturer's certification that air barrier, as designed in the assemblies indicated on the Drawings, has been tested to meet the requirements of NFPA 285 and passed.
- E. Air Barrier Certification: Submit manufacturer's certification that air barrier, as designed in the assemblies indicated on the Drawings, has been tested to meet the requirements of NFPA 285 and passed.
- F. Qualification Data: For Applicator.
- G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for air barriers.

1.7 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm experienced in applying air barrier materials similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Mockups: Before beginning installation of air barrier, build mockups of exterior wall assembly 150 sq. ft., incorporating backup wall construction, external cladding, window, door frame and

sill, insulation, and flashing to demonstrate surface preparation, crack and joint treatment, and sealing of gaps, terminations, and penetrations of air barrier membrane.

- 1. Coordinate construction of mockup to permit inspection by Owner's testing agency of air barrier before external insulation and cladding is installed.
- Include junction with roofing membrane, building corner condition, and foundation wall intersection.
- 3. If the Architect determines mockups do not comply with requirements, reconstruct mockups and apply air barrier until mockups are approved.
- 4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- C. Preinstallation Conference: Conduct conference at Project site.
 - Include installers of other construction connecting to air barrier, such as roofing, waterproofing, architectural precast concrete, masonry, joint sealants, windows, glazed curtain walls, and door frames.
 - 2. Review air barrier requirements including surface preparation, substrate condition and pretreatment, minimum substrate curing period, forecasted weather conditions, special details and sheet flashings, mockups, installation procedures, sequence of installation, testing and inspecting procedures, and protection and repairs.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store liquid materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by air barrier manufacturer.
- B. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- C. Store rolls according to manufacturer's written instructions.
- D. Protect stored materials from direct sunlight.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended by air barrier manufacturer. Protect substrates from environmental conditions that affect performance of air barrier. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

PART 2 - PRODUCTS

- A. Fluid-Applied, Vapor-Permeable Membrane Air Barrier: Elastomeric, modified bituminous, or synthetic polymer membrane.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Carlisle Coatings & Waterproofing; Barritech VP.
 - b. GCP Applied Technologies (formerly W.R. Grace); Perm-A-Barrier VPL.
 - c. Henry Co.; Air Bloc 17MR.
 - d. Tremco; ExoAir 230.

- e. W.R. Meadows; Air-Shield LMP.
- 2. Physical and Performance Properties:
 - Membrane Air Permeance: Not to exceed 0.004 cfm/ sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.
 - b. Membrane Vapor Permeance: Not less than 10 perms; ASTM E 96.
 - c. Fire Test Performance: Passes NFPA 285, Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

2.2 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by air barrier manufacturer for intended use and compatible with air barrier. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Primer: Liquid waterborne or solvent-borne primer recommended for substrate by manufacturer of air barrier material.
- C. Counterflashing Strip: Modified bituminous 40-mil-thick, self-adhering sheet consisting of 32 mils of rubberized asphalt laminated to an 8-mil-thick, crosslaminated polyethylene film with release liner backing.
- D. Butyl Strip at Termination with EPDM or TPO Roofing Membrane: Vapor-retarding, 30- to 40-mil-thick, self-adhering; polyethylene-film-reinforced top surface laminated to layer of butyl adhesive, with release liner backing.
- E. Modified Bituminous Strip To Cover Cracks and Joints and Terminate Air Barrier to Compatible Roofing Membrane: Vapor-retarding, 40-mil-thick, smooth-surfaced, self-adhering; consisting of 36 mils of rubberized asphalt laminated to a 4-mil- polyethylene film with release liner backing.
- F. Termination Mastic: Cold fluid-applied elastomeric liquid; trowel grade.
- G. Substrate Patching Membrane: Manufacturer's standard trowel-grade substrate filler.
- H. Adhesive and Tape: Air barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape.
- I. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, 0.0187 inch thick, and Series 300 stainless-steel fasteners.
- J. Sprayed Polyurethane Foam Sealant to Fill Gaps at Penetrations and Openings: one- or two-component, foamed-in-place, polyurethane foam sealant, 1.5 to 2.0 lb/cu. ft. density; flame spread index of 25 or less according to ASTM E 162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.
- K. Modified Bituminous Transition Strip to Seal Air Barrier Terminations with Glazing Systems: Vapor-retarding, 40-mil-thick, smooth-surfaced, self-adhering; consisting of 36 mils of rubberized asphalt laminated to a 4-mil-thick polyethylene or aluminum film with release liner backing.

- L. Preformed Silicone-Sealant Extrusion to Seal Air Barrier Terminations with Glazing Systems: Manufacturer's standard system consisting of cured low-modulus silicone extrusion, sized to fit opening widths, with a single-component, neutral-curing, Class 100/50 (low-modulus) silicone sealant for bonding extrusions to substrates.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dow Corning Corporation; 123 Silicone Seal.
 - b. Elbex Corp: Transition Silicone Sheeting.
 - c. GE Silicone; UltraSpan US1100.
 - d. Tremco; approved equal.
- M. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low-modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O. Comply with Section 079200 JOINT SEALANTS.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance.
 - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
 - 2. Verify that concrete has cured and aged for minimum time period recommended by air barrier manufacturer.
 - 3. Verify that concrete is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
 - 4. Verify that masonry joints are flush and completely filled with mortar.
 - 5. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Clean, prepare, and treat substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching membrane.
- E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- F. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.

- 1. Install modified bituminous strips and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch.
- G. Bridge and cover isolation joints expansion joints and discontinuous deck-to-wall and deck-to-deck joints with overlapping modified bituminous strips.
- H. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

3.3 JOINT TREATMENT IN PREPARATION FOR INSTALLATION OF FLUID-APPLIED MEMBRANE

- A. Concrete and Masonry: Prepare, treat, rout, and fill joints and cracks in substrate according to ASTM C 1193 and air barrier manufacturer's written instructions. Remove dust and dirt from joints and cracks complying with ASTM D 4258 before coating surfaces.
 - 1. Prime substrate and apply a single thickness of preparation coat strip extending a minimum of 3 inches along each side of joints and cracks. Apply a double thickness of air barrier membrane and embed a joint reinforcing strip in preparation coat.
- B. Gypsum Sheathing: Fill joints greater than 1/4 inch with sealant according to ASTM C 1193 and with air barrier manufacturer's written instructions. Apply first layer of fluid air barrier membrane at joints. Tape joints with joint reinforcing strip after first layer is dry. Apply a second layer of fluid air barrier membrane over joint reinforcing strip.

3.4 TRANSITION STRIP INSTALLATION

- A. Install strips, transition strips, and auxiliary materials according to air barrier manufacturer's written instructions to form a seal with adjacent construction and maintain a continuous air barrier.
 - 1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
 - 2. Install butyl or modified bituminous strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over both substrates.
- B. Apply primer to substrates at required rate and allow to dry. Limit priming to areas that will be covered by air barrier sheet in same day. Reprime areas exposed for more than 24 hours.
 - 1. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.
- C. Connect and seal exterior wall air barrier membrane continuously to roofing membrane air barrier, concrete below-grade structures, floor-to floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- D. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.

- E. Apply joint sealants forming part of air barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- F. Wall Openings: Prime concealed perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip so that a minimum of 3 inches of coverage is achieved over both substrates. Maintain 3 inches of full contact over firm bearing to perimeter frames with not less than 1 inch of full contact.
 - 1. Transition Strip: Roll firmly to enhance adhesion.
 - 2. Elastomeric Flashing Sheet: Apply adhesive to wall, frame, and flashing sheet. Install flashing sheet and termination bars, fastened at 6 inches o.c. Apply lap sealant over exposed edges and on cavity side of flashing sheet.
 - 3. Preformed Silicone-Sealant Extrusion: Set in full bed of silicone sealant applied to walls, frame, and membrane.
- G. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air barrier membrane with foam sealant.
- H. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
- I. Seal top of through-wall flashings to air barrier with an additional 6-inch-wide, modified bituminous strip.
- J. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- K. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches beyond repaired areas in strip direction.

3.5 INSTALLATION OF FLUID-APPLIED MEMBRANE AIR BARRIER

- A. Apply air barrier membrane to form a seal with strips and transition strips and to achieve a continuous air barrier according to air barrier manufacturer's written instructions.
- B. Apply air barrier membrane within manufacturer's recommended application temperature ranges.
- C. Apply primer to substrates at required rate and allow to dry. Limit priming to areas that will be covered by air barrier sheet in same day. Reprime areas exposed for more than 24 hours.
 - 1. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.
- D. Apply a continuous unbroken air barrier to substrates according to the following minimum thickness. Apply membrane in full contact around protrusions such as masonry ties.
 - 1. Vapor-Permeable Membrane Air Barrier: 120-mil wet film thickness.

- E. Apply strip and transition strip a minimum of 1 inch onto cured air membrane or strip and transition strip over cured air membrane overlapping 3 inches onto each surface according to air barrier manufacturer's written instructions.
- F. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.
- G. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air barrier components.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections and prepare test reports.
- B. Inspections: Air barrier materials and installation are subject to inspection for compliance with requirements. Inspections may include the following:
 - 1. Continuity of air barrier system has been achieved throughout the building envelope with no gaps or holes.
 - 2. Continuous structural support of air barrier system has been provided.
 - 3. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
 - 4. Site conditions for application temperature and dryness of substrates have been maintained.
 - 5. Maximum exposure time of materials to UV deterioration has not been exceeded.
 - 6. Surfaces have been primed.
 - 7. Laps in sheet materials have complied with the minimum requirements and have been shingled in the correct direction (or mastic applied on exposed edges), with no fishmouths.
 - 8. Termination mastic has been applied on cut edges.
 - 9. Air barrier has been firmly adhered to substrate.
 - 10. Compatible materials have been used.
 - 11. Transitions at changes in direction and structural support at gaps have been provided.
 - 12. Connections between assemblies (membrane and sealants) have complied with requirements for cleanliness, preparation, and priming of surfaces, structural support, integrity, and continuity of seal.
 - 13. All penetrations have been sealed.

C. Tests:

- 1. Qualitative Testing: Air barrier assemblies will be tested for evidence of air leakage according to ASTM E 1186.
- 2. Quantitative Air Leakage Testing: Testing not to exceed the test pressure differential, positive and negative, indicated in "Performance Requirements" Article for air barrier assembly air leakage according to ASTM E 783.
- D. Remove and replace deficient air barrier components and retest as specified above.

3.7 CLEANING AND PROTECTION

A. Protect air barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

- 1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. Remove and replace air barrier exposed to these conditions for more than 30 days.
- 2. Protect air barrier from contact with creosote, uncured coal-tar products, TPO, EPDM, flexible PVC membranes, and sealants not approved by air barrier manufacturer.
- B. Clean spills, stains, and soiling from adjacent construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 074300 - FIBER-CEMENT WALL PANELS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Fiber-cement wall panels and attachment systems.
- B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
 - 1. Section 054000 COLD-FORMED METAL FRAMING for secondary support framing supporting fiber-cement wall panels.
 - 2. Section 072100 THERMAL INSULATION for insulation behind fiber-cement panels.
 - 3. Section 076200 SHEET METAL FLASHING AND TRIM for copings, flashings, and other sheet metal work not part of fiber-cement wall panel assemblies.
 - 4. Section 079200 JOINT SEALANTS for field-applied sealants not otherwise specified in this Section.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide fiber-cement wall panel assemblies that comply with performance requirements specified as determined by testing manufacturers' standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.
- B. Structural Performance: Provide fiber-cement wall panel assemblies capable of withstanding the effects of gravity loads and loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 1592 and ASTM E 330 as applicable.
 - 1. Wind Loads: As required by Code.
 - 2. Deflection Limits: Engineer fiber-cement wall panel assemblies to withstand test pressures with deflection no greater than 1/180 of the span and no evidence of material failure, structural distress, or permanent deformation exceeding 0.2 percent of the clear span, at code required loading.
- C. Thermal Movements for Fiber-Cement Wall Panels: Provide fiber-cement wall panel assemblies that allow for noiseless thermal movements resulting from the following range in ambient temperatures and that prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects:
 - 1. Ambient Temperature Range: Minus 20 to plus 180 deg F.

1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of fiber-cement wall panel and accessory.
- B. Shop Drawings: Show fabrication and installation layouts of fiber-cement wall panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details. Distinguish between factory- and field-assembled work.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
 - 1. Fiber-Cement Panels: 12 inches square. Include fasteners, closures, and other fiber-cement wall panel accessories. Include 4-way joint.
 - 2. Exposed Sealants: For each type and color of joint sealant required. Install joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of fiber-cement wall panels adjacent to joint sealants.
- D. Qualifications: Qualifications of professional engineer and qualifications of installer as specified.

1.5 QUALITY ASSURANCE

- A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the state the 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 panels that are similar to those indicated for this Project in material, design, and extent.
- C. Installer Qualifications: An employer of workers trained and approved by manufacturer.
 - Installer's responsibilities include fabricating and installing fiber-cement wall panel assemblies and providing professional engineering services needed to assume engineering responsibility.
 - 2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- D. Fabricator Qualifications: Certified by fiber-cement wall panel manufacturer to fabricate and install manufacturer's wall panel system.
- E. Source Limitations: Obtain each type of fiber-cement wall panel through one source from a single manufacturer.
- F. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use manufacturer's standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

- G. Fire-Resistance Ratings: Where indicated, provide fiber-cement wall panels identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.
- H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01. Review methods and procedures related to fiber-cement wall panel assemblies including, but not limited to, the following:
 - 1. Meet with The Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, fiber-cement wall panel Installer, fiber-cement wall panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects fiber-cement wall panels including installers of doors, windows, and louvers.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review methods and procedures related to fiber-cement wall panel installation, including manufacturer's written instructions.
 - 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
 - 5. Review flashings, special details, wall penetrations, openings, and condition of other construction that will affect fiber-cement wall panels.
 - 6. Review governing regulations and requirements for insurance, certificates, and testing and inspecting if applicable.
 - Review temporary protection requirements for fiber-cement wall panel assembly during and after installation.
 - 8. Review fiber-cement wall panel observation and repair procedures after fiber-cement wall panel installation.
 - 9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, fiber-cement wall panels, and other manufactured items so as not to be damaged or deformed. Package fiber-cement wall panels for protection during transportation and handling.
- B. Unload, store, and erect fiber-cement wall panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Store fiber-cement wall panels vertically, covered with suitable weathertight and ventilated covering. Store fiber-cement wall panels to ensure dryness, with positive slope for drainage of water. Do not store fiber-cement wall panels in contact with other materials that might cause staining, denting, or other surface damage. Do not allow storage space to exceed 120 deg F.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of fiber-cement wall panels to be performed according to manufacturers' written instructions and warranty requirements.

- B. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before fiber-cement wall panel fabrication and indicate measurements on Shop Drawings.
 - Established Dimensions: Where field measurements cannot be made without delaying the Work, either establish framing and opening dimensions and proceed with fabricating fiber-cement wall panels without field measurements, or allow for field trimming of panels. Coordinate wall construction to ensure that actual building dimensions, locations of structural members, and openings correspond to established dimensions.

1.8 COORDINATION

A. Coordinate fiber-cement wall panel assemblies with rain drainage work, flashing, trim, and construction of girts, studs, soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of fiber-cement wall panel assemblies that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures, including rupturing, cracking, or puncturing.
 - b. Deterioration of fiber-cement, metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace fiber-cement wall panels that show evidence of deterioration of finishes within specified warranty period.
 - 1. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 FIBER-CEMENT SIDING AND TRIM

- A. General: Siding made from high-density fiber-cement board that complies with ASTM C 1186, Type A, Grade II; is classified as noncombustible when tested according to ASTM E 136; and has a flame-spread index of 25 or less when tested according to ASTM E 84.
 - 1. Vertical Pattern: Panels 5/16 inches thick x 48 inches wide x 120 inches high in plain style and smooth texture.
 - 2. Color: Flint 921.
 - 3. Basis-of-Design: Cembonit Panels by Cembrit.
- B. Labeling: Provide fiber-cement siding that is tested and labeled according to ASTM C 1186 by a qualified testing agency acceptable to authorities having jurisdiction.

2.2 RAINSCREEN ATTACHMENT SYSTEM

- A. Framing: Thermally isolated framing system with 3/4 in. rain screen cavity fabricated from 16 gauge 55 AL-ZN AZ50 coated steel. Vertical girt with 2 in. wide fastening face.
- B. Fasteners: Provide stainless steel self-drilling fastener with thermal break as recommended by manufacturer.
- C. Thermal Break Insulation: Provide flexible, nanoporous aerogel blanket insulation.
 - 1. Basis of Design: Aspen Aerogels, Inc.; Spaceloft.
 - 2. Thickness: 10 mm.
 - 3. R-Value: 4
 - 4. Fire Performance: ASTM E 84, Class A.

2.3 ACCESSORIES

- A. Siding Accessories, General: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration.
 - 1. Provide accessories made from same material as adjacent siding unless otherwise indicated.
- B. Decorative Accessories: Provide the following fiber-cement decorative accessories as indicated on the Drawings.
 - 1. Colors for Decorative Accessories: As selected by Architect from manufacturer's full range of industry colors.
- C. Flashing: Provide stainless-steel flashing complying with Section 076200 SHEET METAL FLASHING AND TRIM at window and door heads and where indicated.

D. Fasteners:

- 1. For fastening fiber-cement, use stainless-steel fasteners.
- 2. For fastening to wood, use siding nails or ribbed bugle-head screws of sufficient length to penetrate a minimum of 1 inch into substrate.
- 3. For fastening to metal, use ribbed bugle-head screws of sufficient length to penetrate a minimum of 1/4 inch, or three screw-threads, into substrate.
- 4. Staples, small brads, and wire nails will not be accepted.

2.4 FABRICATION

- A. General: Fabricate and finish fiber-cement wall panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. Sheet Metal Accessories: Fabricate trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.

- 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
- 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
- 3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- 4. Sealed Joints: Form nonexpansion but movable joints in fiber-cement to accommodate elastomeric sealant to comply with SMACNA standards.
- 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
- 6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended by fiber-cement wall panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or fiber-cement wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES, GENERAL

A. Finish: As indicated on the Finish Index on the Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, fiber-cement wall panel supports, and other conditions affecting performance of work.
 - 1. Examine primary and secondary wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by fiber-cement wall panel manufacturer.
 - 2. Examine solid wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by fiber-cement wall panel manufacturer.
 - 3. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
- B. Examine roughing-in for components and systems penetrating fiber-cement wall panels to verify actual locations of penetrations relative to seam locations of fiber-cement wall panel before fiber-cement wall panel installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.

B. Miscellaneous Framing: Install subgirts, base angles, sills, furring, and other miscellaneous wall panel support members and anchorage according to ASTM C 754 and fiber-cement wall panel manufacturer's written recommendations.

3.3 FIBER-CEMENT WALL PANEL INSTALLATION, GENERAL

- A. General: Install fiber-cement wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts and subgirts, unless otherwise indicated. Anchor fiber-cement wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 1. Field cutting of fiber-cement wall panels is not permitted.
 - 2. Shim or otherwise plumb substrates receiving fiber-cement wall panels.
 - 3. Rigidly fasten base end of fiber-cement wall panels and allow eave end free movement due to thermal expansion and contraction. Predrill panels.
 - 4. Flash and seal fiber-cement wall panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until weather barrier and flashings that will be concealed by fiber-cement wall panels are installed.
 - 5. Install screw fasteners in predrilled holes.
 - 6. Locate and space fastenings in uniform vertical and horizontal alignment.
 - 7. Install flashing and trim as fiber-cement wall panel work proceeds.
 - 8. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 - 9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated or, if not indicated, as necessary for waterproofing.
 - 10. Align bottom of fiber-cement wall panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 - 11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.
- B. Fasteners: Use stainless-steel fasteners.
- C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by fiber-cement wall panel manufacturer.

3.4 WALL PANEL INSTALLATION

- A. General: Install attachment system required to support wall panels and to provide a complete weathertight wall system, including subgirts, perimeter extrusions, tracks, drainage channels, panel clips, and anchor channels.
 - 1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.
 - 2. Do not begin installation until weather barrier and flashings that will be concealed by composite panels are installed.
- B. Track-Support Installation: Provide manufacturer's standard horizontal and vertical tracks that provide support and complete secondary drainage system, draining to the exterior at horizontal joints. Install support system at locations, spacings, and with fasteners recommended by manufacturer. Attach panels to wall by interlocking tracks with perimeter extrusions attached to

wall panels. Fully engage integral gaskets and leave horizontal and vertical joints with open reveal.

1. Attach routed-and-returned flanges of wall panels to perimeter extrusions with manufacturer's standard fasteners.

3.5 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
 - Install components required for a complete fiber-cement wall panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
 - 1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
 - 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.6 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align fiber-cement wall panel units within installed tolerance of 1/4 inch in 20 feet nonaccumulative, on level, plumb, and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.7 CLEANING AND PROTECTION

- A. After fiber-cement wall panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- B. Replace fiber-cement wall panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 075323 EPDM ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Applicable provisions of the Conditions of the Contract and Division 1, General Requirements, govern work in this Section.

1.2 DESCRIPTION OF WORK

- A. The work of this Section includes all plant, labor, materials, equipment, testing and services necessary to complete the work shown on the drawings, schedules, and keynotes, as specified, and as may be required by conditions and authorities having jurisdiction, including, but not limited to, the following:
 - Inspect the underside of the roof decks before starting work, and periodically each
 day as work occurs, to determine if there are conduits, pipes, ceiling hangers or
 fixtures next to the deck or fastened to the deck that could be affected as roof
 work occurs.
 - a. Perform the work so any conduits, pipes, ceiling hangers or fixtures are not disturbed.
 - b. Replace and reset any conduits, pipes, ceiling hangers or fixtures that are affected by the work.
 - 2. Remove and dispose of existing gravel surfacing, roofing, insulation, the vapor barrier, underlayment, wood blocking, and flashing.
 - 3. Clean all residual material from the surface of the existing decks, and from within the flutes of the new steel decks.
 - a. The work may include removing asbestos containing roofing materials. Refer to the asbestos abatement specification for additional information and asbestos removal requirements.
 - 4. Install a new fully adhered unreinforced 60 mil thick EPDM roofing system, including a vapor barrier on concrete deck areas, a thermal barrier on new steel deck areas, insulation, cover board, flashing, stripping and related accessories.
 - 5. Provide any miscellaneous mechanical, electrical, hoisting and other work needed, and remove, adjust, modify, reset and reconnect existing roof-mounted and roof-penetrating equipment.
 - 6. Install new flashings at the roof drains, and all roof-mounted and roof-penetrating equipment.
 - 7. Disconnect and remove abandoned mechanical equipment and curbs, and infill the roof deck.

- 8. Repair deterioration less than 1/2 inch deep in the surface of the existing light-weight concrete deck using fast setting concrete grout on a Unit Price Basis. Include 500 square feet of deck repair in the Base Bid.
- 9. Protect roof surfaces where material and equipment are placed on them, and where construction traffic occurs, with 6 mil fire retardant polyethylene covered with 1-1/2 inch thick foam insulation, overlaid with 2 by 10 wooden planks.
- 1.3 RELATED WORK SPECIFIED ELSEWHERE Entire Project Specification with specific reference to those sections noted above and as follows:

A. 040100 Masonry Maintenance

B. 061000 Roof Carpentry

C. 076200 Sheet Metal Flashing & Specialties

D. 077200 Roof Accessories

E. 013113 & Divisions 21, 22, 23 and 26 Mechanical and Electrical

1.4 CODE APPROVAL REQUIREMENTS

- A. Install roofing and insulation system components to meet the following minimum requirements:
 - 1. New York State Uniform Fire Prevention and Building Code, which includes by reference the New York State Energy Conservation Code.
 - 2. Underwriters Laboratories Inc. Class A External Fire Rating for roof assemblies tested in accordance with ASTM E 108 or UL 790.
 - 3. Underwriters Laboratories Inc. Standard 1256 for roof assemblies with foam insulation.
 - 4. Minimum wind uplift pressure calculated using ASCE 7 and a safety factor of 2:

a. Field Zone: 90 psf

b. Perimeter Zones: 135 psf

c. Corner Zone: 180 psf

B. Provide written certification from the roof material Manufacturer, before beginning work, to confirm the roofing system meets these requirements.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications:
 - A firm (Installer) with at least 5 continuous years experience performing work similar to that required for this project, employing personnel skilled in the work specified.
 - The Installer shall directly employ the personnel performing the work of this section.

- b. The Installer shall have a supervisor on the roof when work is in progress. The Supervisor shall have a minimum of 5 years experience with work similar in nature and scope to this project, and speak fluent English.
 - 1. Submit the supervisor's resume upon request.
- 2. The Installer shall provide a reference list of at least three previously completed projects of comparable size and similar design within fifty miles of this project, which may be observed by representatives of the Owner:
 - a. The reference list shall include at a minimum, the completion date, a description of the work performed, the Owner's name contact person phone number and address and the Architect's name contact person and phone number.
 - b. Submit the reference list upon request.
- 3. The Installer shall be acceptable to or licensed by the Manufacturer of the primary roofing materials, and provide written certification from the Manufacturer to confirm this prior to award if requested.
- B. Material Quality: Obtain each product, including the insulation, cover board, roofing, flashing, cements, primers and adhesives from a single Manufacturer which has manufactured the same products in the United States of America for not less than 5 continuous years.
- C. Material Quality: Obtain each type of material from a single source to ensure consistent quality, color, pattern, and texture.

1.6 PRE-CONSTRUCTION

- A. Meet at the project site approximately two weeks prior to starting work, with the Architect, Owner and other representatives to discuss the following:
 - 1. How the building will be kept watertight as old roofing is removed and the work progresses.
 - 2. How the vapor barrier, thermal barrier, insulation, cover board, flashings and roof will be installed to make a watertight assembly.
 - 3. Generally accepted industry practice and the Manufacturer's instructions for handling and installing his products.
 - 4. The condition of the substrate (deck), curbs, penetrations and other preparatory work needed.
 - 5. Incomplete submittals; note that progress payments will be not processed until all submittals are received and approved.
 - 6. The construction schedule, weather forecast, availability of materials, personnel, equipment and facilities needed to proceed and complete the work on schedule.

7. A schedule for Manufacturer and Architect inspections.

1.7 SUBMITTALS

- A. Submit the following items far enough in advance to obtain approval prior to performing any work on site:
 - A pre-work site and building inspection report with photos to document conditions before work starts.
 - 2. Written certification from the Manufacturer which states that the Installer is acceptable or licensed to install the specified roofing; if not previously provided.
 - 3. Manufacturer's technical literature for all materials.
 - 4. Samples of the Contractor's Guarantee and Manufacturer's warranty forms.
 - 5. Test reports and certifications substantiating compliance with specification requirements, only if requested by the Architect.
- B. Simultaneously provide all roof related submittals needed for this project, for all technical sections, collated by section. Incomplete submittals will not be reviewed.
 - 1. Submittals shall be prepared and made by the firm that will perform the actual work.
 - 2. Provide electronic submittals via an on-line submittal exchange program if one is established for this project; if an on-line program is not established, provide the submittals on portable USB drives in pdf format, organized in folders by Section.
 - a. Do not make submittals via email
 - b. Do not include Safety Data Sheets with the technical submittals; submittals made this way will be rejected they will not be reviewed..
- C. Safety Data Sheets: Simultaneously provide all Safety Data Sheets needed for this project, for all specification sections collated by section, in three ring binders. Provide two binders for each building.
- D. Payment requisitions will not be processed until all submittals are received and approved.

1.8 JOB CONDITIONS (CAUTIONS & WARNINGS)

- A. Do not use oil or solvent based roof cement with EPDM roofing. Do not allow waste products, (petroleum grease or oil, solvents, vegetable or mineral oil, animal fat) or direct steam venting to contact any roofing, insulation or flashing product. Do not expose EPDM roofing and accessories to a temperature in excess of 175 degrees Fahrenheit.
- B. Splice cleaner, primer, cements and bonding adhesives are flammable. Do not breathe vapors or use near fire or flame or in a confined or unventilated area. Dispense only from a UL listed safety can or the Manufacturer's original container.
- C. Remove empty adhesive, cleaner and solvent containers and contaminated rags from the roof and legally dispose of them daily.

D. Do not apply primer, cleaners or adhesives next to ventilation system louvers or windows. Temporarily cover the louvers and windows with 6 mil fire retardant polyethylene and prevent odors from entering the building. Remove temporary covers at the end of each day's work.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver and apply all materials before the Manufacturer's expiration dates, printed on the product labels.
- B. Deliver material to the site in the Manufacturer's original and unopened packaging, with intact and legible labels which identify the products and Manufacturers,
- C. Cover all stored materials, except rolls of EPDM and sealed cans of adhesives, with watertight tarpaulins installed immediately upon delivery.
- D. Immediately remove insulation which gets wet from the job site.
- E. Store and install all material within the Manufacturer's recommended temperature range.
- F. Do not overload the structure when storing materials on the roof.
- G. Protect new and existing roof surfaces where material and equipment are placed on them, and where construction traffic occurs, with 6 mil fire retardant polyethylene, covered with 1-1/2 inch thick foam insulation, overlaid with 2 by 10 wooden planks.

1.10 GUARANTEE AND WARRANTY

- A. Provide a written Manufacturer's Full System Warranty which warrants that the roofing system, including the insulation, cover board, EPDM roofing and flashings, will remain in a watertight condition for twenty years beginning upon Final Completion.
 - 1. Guarantee coverage shall remain in effect for gust wind speeds up to 72 miles per hour, measured at ground level at the site.
 - 2. Guarantee coverage shall have no dollar value limit.
- B. Provide a written Contractor's Guarantee which guaranties that all work will remain free of material and workmanship defects and in a watertight condition for five years beginning upon Final Completion:
 - 1. Defects include but are not limited to the following: leakage, adhesive separation, delamination, lifting, loosening, splitting, cracking, joint separation, movement and undue expansion or shrinkage.
 - 2. Guarantee coverage shall provide the repairs and modifications necessary to enable the work to perform as guaranteed.
 - 3. Guarantee coverage shall include removing and replacing materials installed as part of the original work, if removal is needed to affect guaranteed repairs.

- 4. Guarantee coverage shall remain in effect for gust wind speeds up to 72 miles per hour, measured at ground level at the site.
- 5. Guarantee coverage shall have no dollar value limit.
- 6. The Contractor's Surety Company may add a rider to the Performance Bond which clarifies that Performance Bond Coverage expires two years after Final Completion; i.e., Performance Bond Coverage does not run for the five year term of the Contractor's Guarantee.
- C. Provide one Contractor's Guarantee that covers "all work performed" when a single contractor is awarded work specified in multiple Sections.
- D. The Manufacturer's Warranty and Contractors Guarantee shall take effect no more than 30 days before the completion of all punch list work.
- E. Guarantee and Warranty coverage may be cancelled, for the affected portion of the roof, if the work is damaged by winds in excess of 72 mph, by hail, lightning, insects or animals, by failure of the structural substrate, by exposure to harmful chemicals, by other trades on the roof, or by vandalism, or if the Owner fails to maintain the roof in accordance with, or makes roof alterations contrary to, the Manufacturer's printed recommendations.
 - 1. Guarantee and Warranty coverage shall be reinstated, for the remainder of the original period; if the Owner restores the roof to the condition it was in prior to the damage occurring.

1.11 SUBSTITUTIONS

- A. The following factors will be considered when evaluating a possible alternative to the roofing system specified:
 - 1. The wording and intent of the warranty to be issued.
 - 2. The financial status, number of years in business, and stability of the entity that will issue the warranty.
 - A reference list of at least five completed similar projects of comparable size, with a successful functional history of at least five years, within approximately fifty miles of the Project.
 - 4. Technical aspects of the system, especially relating to durability, serviceability and performance.
 - 5. The Manufacturer's ability and history providing technical support, on-site inspections and in progress assistance.
 - 6. The availability and experience of local authorized applicators to install and maintain the proposed alternate system.

7. The Manufacturer's willingness and history responding to warranty claims previously made by the Owner, Architect or Consultant's involved in this project.

PART 2 - PRODUCTS

2.1 GENERAL

- A. EPDM roof system components are specified as products of Elevate / Firestone Building Products Company to establish a basis of design standard of quality. Equal products and systems from Johns Manville and Carlisle SynTec will be accepted.
- B. Primary products required for this project include:
 - 1. Vapor barrier
 - 2. Thermal barrier
 - 3. Roof insulation
 - 4. Cover board
 - 5. EPDM roofing
 - 6. Primers and adhesives
 - 7. Sealants
 - 8. EPDM flashing
 - 9. Fasteners

2.2 EPDM

 Unreinforced 60 mils thick, fire retardant, EPDM (Ethylene Propylene Diene Monomer) sheet membrane conforming to the following minimum physical properties.

PROPERTY	TEST METHOD	SPECIFICATION
Color	_	Gray/Black
Tensile Strength	ASTM D-412	1305 psi min.
Elongation	ASTM D-412	300% min
Tear Strength	ASTM D-624	150 lb/in min
Ozone Resistance	ASTM D-1149	No cracks, 7 days/100 pphm/100°F/50% strain
Heat Aging	ASTM D-573	1200 psi min@ 200% elongation/4 wks/240°F
Brittleness Temperature	ASTM D-746	-49°F
Water Vapor Permanence	ASTM E-96	2.0 perm max
Thickness	ASTM D-412	60 mils plus/minus 6 mils
Fire Retardant		UL Class A

2.3 RELATED MATERIALS

- A. Cleaners, adhesives, sealants, caulking and fasteners furnished by the EPDM system Manufacturer, that comply with low VOC regulations in effect at the time of application.
 - 1. Stripping: 90 mil thick 5 inch and 9 inch wide self adhering flashing, consisting of 45 mils of semi-cured EPDM factory laminated to 45 mils of cured seaming tape.
 - 2. Bonding Adhesive: High strength contact adhesive.

- 3. Splice Adhesive: High strength synthetic polymer based contact cement formulated specifically to splice EPDM sheets.
- 4. Lap Sealant: EPDM rubber based gun grade sealant.
- 5. Water Block Seal: One component low viscosity butyl rubber sealant.
- 6. Pre-Molded Pipe Flashing: Pressure sensitive prefabricated flashings with pre-applied adhesive.
- 7. Pourable Sealer: Two component, solvent free polyurethane based sealant.
- 8. Reinforced Perimeter Fastening Strips: .030 inch thick reinforced cured EPDM.
- 9. Seam Tape Primer: Synthetic rubber polymer based primer designed to clean and prime seam tape spice areas prior to installing the tape.
- 10. Seam Splice Tape: Nominal 30 mil thick cured polymer self adhesive tape with release paper carrier, 6 inches wide.
- 11. Plates and Bars: Galvanized and corrosion resistant specialty products.
- 12. Fasteners: #14 Fluorocarbon polymer coated heavy duty screws.
- B. Primer & Vapor Barrier:
 - 1. Primer: Thin, cut back asphalt meeting ASTM D41.
 - Vapor Barrier: Fire resistant torch grade SBS modified granular surfaced polyester and glass scrim reinforced cap sheet meeting ASTM D 6163 Type I, Grade G, furnished by the same manufacturer as the EPDM.
- C. Thermal Barrier: 1/2 inch thick fire resistant gypsum board decking with inorganic glass mat facers and a water resistant core, formulated in 48 x 48 inch square edge boards, UL Class A, meeting ASTM C-1177, manufactured under the trade name Dens-Deck Prime.
- D. Insulation: Flat and tapered rigid cellular polyisocyanurate boards with fibrous felt/fiberglass mat facers, minimum compressive strength 20 psi, meeting ASTM C1289-01, Type II, Class1, Grade 2, as manufactured by Elevate / Firestone under the trade name of "ISO 95+ Isocyanurate Insulation". Minimum thickness as shown on the roof plan.
 - 1. Tapered insulation sloping 1/8 and 1/4 inch per foot.
 - a. Install insulation that slopes 1/8 inch per foot on existing sections of roof.
 - b. Install insulation that slopes 1/4 inch per foot on new addition sections of roof.
 - 2. Crickets sloping 1/4 and 1/2 inch per foot.
- E. Tapered edge strips high density isocyanurate or wood fiberboard strips installed at the drain sumps, and insulation transition points.

- F. Cover Board: 1/4 inch thick fire resistant gypsum board decking with inorganic glass mat facers and a water resistant core, formulated in 48 x 48 inch square edge boards, UL Class A, meeting ASTM C-1177, manufactured under the trade name Dens-Deck Prime.
- G. Insulation adhesive: Two component low rise polyurethane foam adhesive, installed with a mixing extruding Pace Cart dispenser, or with a pleural heated foam rig, Elevate / Firestone I.S.O. Adhesive.
 - 1. Use insulation adhesive suitable for application at the intended application temperatures.
 - 2. Do not use twin cartridge "caulking gun" adhesive except on very small isolated sections of roof.
- H. Concrete Grout: Fast setting Portland cement based polymer modified repair mortar as manufactured by The Quikrete Companies, under the trade name Quick-Setting Cement, or equal.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install the new roofing system in a watertight, workmanlike manner, meeting the guarantee requirements specified herein; in accordance with the drawings and in conformance with the Manufacturer's requirements, except as enhanced by the drawings and specifications.
- B. Perform work next to roof mounted mechanical equipment and change in elevation wall windows, so the work coincides with equipment shutdown periods and does not affect building occupants. Temporarily cover and protect equipment openings, and windows next to the work area, with 6 mil fire retardant polyethylene, so dirt, dust and odors do not enter the equipment or building. Remove covers as soon as the work is complete and at the end of each workday.
- C. Clean substrate surfaces of all laitance, dirt, oil, grease or other foreign matter.
- D. Remove all debris from within the flutes of metal decks.
- E. Remove debris daily and as it is generated. Do not stock-pile debris on the roof. Do not leave any debris on the roof at the end of the day. Do not overload the roof structure when moving debris.
- F. Install roof system components on dry surfaces only. Do not install any components when the weather and outside temperatures are not suitable in accordance with the Manufacturer's recommendations.
- G. Complete all work including the equipment flashings, in sequence as quickly as possible so the smallest area possible is under construction at any one time. Complete the entire area of work begun each day, the same day, and make all exposed edges watertight at the end of each day's work.

H. Protect new and existing roof surfaces where material and equipment are placed on them, and where construction traffic occurs, with 6 mil fire retardant polyethylene, covered with 1-1/2 inch thick foam insulation, overlaid with 2 by 10 wooden planks.

3.2 SUBSTRATE INSPECTION

- A. Remove existing roofing, insulation, flashings, underlayment material, and the vapor barrier as indicated, and carefully check the existing deck to confirm it is well secured to the underlying structure and not rotted or otherwise deteriorated.
- B. Inspect the new metal decks, to confirm they are well secured to the underlying structure, that side laps are secured with screws, and that they are suitable as a base for the new roof.
- C. Immediately notify the Architect and Owner by telephone and in writing if defects in the deck substrate are discovered.
- D. Maintain the building watertight in the interim, but do not install new roof system components until defects have been corrected.

3.3 DECK REPAIR

- A. Light-weight concrete deck repairs:
 - 1. Perform repairs to the surface of light-weight concrete deck, 1/2 inch or less in depth, with quick setting non-shrink grout under the Base Bid.
 - 2. Deterioration greater than 1/2 inch deep shall be brought to the Architects attention for his review and direction.

3.4 VAPOR BARRIER

- A. Install primer and a vapor barrier only on the concrete decks: install the primer and allow it to dry.
- B. Starting at the low point, torch apply and fully adhere modified bitumen vapor barrier sheets to the primed substrate. Lap sheets at least 4 inches at the ply overlaps and at least 6 inches at the end laps.
- C. Carefully install the vapor barrier sheets to achieve only the minimum required bleed out.
- D. Extend vapor barrier up vertical surfaces at the roof perimeter, and up and around all penetrations and curbs, and seal the vapor barrier to provide continuity of the building air/vapor envelope.

3.5 GYPSUM BOARD THERMAL BARRIER

A. Install a gypsum board thermal barrier only on the new construction metal decks. Lay the boards with tight joints. Fill spaces over 1/4 inch.

3.6 INSULATION AND COVER BOARD

- A. Install tapered insulation that slopes 1/8 inch per foot on existing roof areas, and tapered insulation that slopes 1/4 inch per foot on new construction roof areas.
- B. Install tapered insulation neatly cut at all miters and transitions. Do not lace corner boards.
- C. Install insulation with joints offset between rows and layers a minimum of 12 inches. Cut insulation to fit neatly at penetrations and joints. Fill any gap which is greater than 1/4 inch.
- D. Fasten the gypsum board thermal barrier and all layers of insulation only to the top flute of steel decks with screws and discs which penetrate through the deck a minimum of 3/4 inch and a maximum of 1-1/2 inches.
 - 1. Install 16 fasteners per 4 by 8 foot insulation board in the field of the roof.
 - 2. Install 28 fasteners per 4 by 8 foot insulation board in 8 foot wide perimeter zones.
 - 3. Install 32 fasteners per 4 by 8 foot insulation board in 8 foot square corner zones.
 - 4. Carefully choose the length and position of each screw to ensure the screws do not protrude through the underside of the deck where visible inside the school, and to ensure the screws do not damage conduits mounted on the underside of the deck.
- E. Install all layers of insulation using low rise polyurethane foam adhesive over the vapor barrier on the concrete decks, applied in accordance with the Manufacturer's recommendations and to achieve the specified minimum uplift resistance. Offset joints in the insulation between rows and layers a minimum of 12 inches. Cut insulation to fit neatly at penetrations and joints. Fill any gap which is greater than 1/4 inch.
 - 1. Install 1/2 inch diameter adhesive beads 12 inches on center in the field of the roof.
 - 2. Install 1/2 inch diameter adhesive beads 6 inches on center in 8 foot wide perimeter zones.
 - 3. Install 1/2 inch diameter adhesive beads 4 inches on center in 8 foot square corner zones.
- F. Install gypsum cover board using low rise polyurethane foam adhesive applied in accordance with the Manufacturer's recommendations and to achieve the specified minimum uplift resistance, over the insulation with joints offset between rows and layers a minimum of 12 inches. Cut gypsum cover board to fit neatly at penetrations and joints. Fill any gap which is greater than 1/4 inch.
 - 1. Install 1/2 inch diameter adhesive beads 12 inches on center in the field of the roof.
 - 2. Install 1/2 inch diameter adhesive beads 6 inches on center in 8 12 16 foot wide perimeter zones.
 - 3. Install 1/2 inch diameter adhesive beads 4 inches on center in 8 12 16 foot square corner zones.
- G. Place 5 gallon pails half full of gravel or concrete on the insulation and gypsum cover boards to hold them firmly in position for at least 15 minutes while the low rise foam adhesive sets. Position the pails no more than 24 inches apart in all directions.
 - 1. Remove and replace insulation and cover boards installed without using pails of gravel or concrete ballast.

3.7 EPDM

- A. Place EPDM roofing on the substrate without stretching it, and allow it to relax approximately one hour before starting to adhere it to the substrate and form the seams.
- B. Place adjoining sheets in the same manner lapping the edges to shed water.
- C. Fully adhere EPDM to the substrate with bonding adhesive or use self-adhesive sheets, with factory applied adhesive..
 - Open each can of adhesive and stir it with an electric paddle mixer for at least 5
 minutes before applying the adhesive. Re-stir adhesive that isn't used within two
 hours of initial mixing.
 - 2. Do not punch holes in cans of adhesive and use them in a "Better Spreader" without first opening the cans to mix them.
 - 3. Replace used roller covers each day; discard covers after each day's use.
 - 4. Allow bonding adhesive to dry to the touch before joining the EPDM to the substrate.
 - 5. Roll the EPDM onto the dried bonding adhesive and immediately rub it vigorously with a soft bristle broom to ensure complete adhesion.
- D. Remove and replace EPDM roofing installed over improperly applied adhesive or with adhesive that wasn't stirred, and roofing installed over debris or with blisters, ridges, mole runs and similar deficiencies. Removal shall include the insulation and cover board assembly.

3.8 SPLICING

- A. Form EPDM roof splices with 6 inch wide field applied seam tape, or with 3 inch wide factory applied seam tape.
 - 1. Fold the top sheet back and clean mating surfaces using clean rags with splice wash.
 - Scrub a smooth coat of QuickPrime onto mating surfaces, with long strokes, and to obtain complete coverage, using approximately 1 gallon per 225 square feet. Do not allow the QuickPrime to glop, streak or puddle; allow it to dry to the touch before installing the seam tape.
 - 3. Seam tape shall be positioned so 1/8 inch minimum and 1/2 inch maximum will be exposed at the seam edge when the seam is complete.
 - a. Install 5 inch uncured EPDM stripping over any seam where the tape is exposed less than 1/8 inch or more than 1/2 inch.
 - 4. Roll and allow the top sheet to fall freely into place without stretching or wrinkling it.
 - 5. Pull splice tape release paper from within the seam and neatly mate the seam using hand pressure to rub the membrane together.
 - 6. Immediately roll the splice with a 2 inch wide roller, using positive pressure, toward the outer edge of splice.

B. Install uncured EPDM target patches with rounded corners, over all T-Seam intersections.

3.9 PERIMETER FASTENING

A. Secure the EPDM at the perimeter of each roof level, and at eaves, penetrations, expansion joints and slope changes greater than 1 inch in 12 inches. Utilize surface applied discs or adhere the EPDM to continuous reinforced EPDM fastening strips. Secure the discs and EPDM fastening strips 12 inches on center.

3.10 FLASHINGS

- A. Utilized cured EPDM for all flashings; utilize self-curing EPDM at corners and angle changes only where required by the Manufacturer.
 - 1. Form flashing splices, and the splice between the flashing and main roof sheet with 6 inch seam tape.
 - 2. Adhere the flashing to vertical surfaces with bonding adhesive.
 - 3. Fasten the top edge of all flashings, positioning the fasteners 12 inches on center, to be covered by a cap flashing.
- B. Install premolded pipe flashings wherever possible. Where premolded pipe flashings cannot be installed, use field wrapped flashings. Install sealant pockets as a last resort.
- C. Remove existing pipe flashings and Kennedy type couplings and extend the vent pipes to finish a minimum of 18 inches above the roof surface.
 - 1. Extend the pipes using the same type of pipe material as the original vent pipe.
 - 2. Use solvent welded, threaded or no-hub couplings, positioned within the insulation layer to extend the pipes.

3.11 MISCELLANEOUS

- A. Provide any miscellaneous roofing, flashing, caulking, and metal work needed to leave the work complete and entirely watertight, neatly and carefully executed in a thorough and workmanlike manner.
- B. Use personnel skilled and licensed in the trades to perform miscellaneous mechanical and electrical work. Provide new material, couplings, transition pieces, blocking, fasteners and the like needed to complete the work.

3.12 CLEANING, PROTECTION AND WATERTIGHTNESS

- A. Inspect the interior and exterior of the building and grounds, and submit a written report with photos to document any existing leak or damage, prior to performing any work on site.
- B. The Owner will conduct a similar inspection at the completion of the work, and the Contractor will be charged for all leaks and damage that weren't documented in the Contractor's report, or repaired to the Owners satisfaction at the Contractor's expense.
- C. Provide any equipment, material and labor necessary to protect the site, the building, its contents and occupants, pedestrians, and surrounding landscaped and paved

areas from damage due to the construction work or from inclement weather during construction.

- D. Do not perform work during inclement weather. Protect incomplete work and the building from damage by inclement weather which may occur unexpectedly. Make all work areas watertight at the end of each day's work.
- E. Clean up all litter, refuse, rubbish, scrap materials and debris at least twice a day; at noon and at the end of the work day, so the roof and site are neat, orderly and workmanlike. Place the debris in a dumpster, and remove the dumpster from the site as soon as it is full or no longer being used.
- F. Carefully and thoroughly clean the entire roof to remove all residual debris when all work is complete. After cleaning the roof, thoroughly clean all drain sumps, drain lines, leader heads and leaders. Do not allow debris to enter the drainage system.

3.13 ROOF INSPECTIONS BY MANUFACTURER

- A. Arrange for the roofing Manufacturer, or his authorized representative, to make a minimum of five inspections in accordance with the following schedule and submit a written report of each inspection to the Architect.
 - 1. First inspection during the first two days of new roof installation.
 - 2. Second inspection when roofing is approximately one third complete.
 - 3. Third inspection when roofing is approximately two thirds complete.
 - 4. Fourth inspection when all roofing and flashings are substantially installed.
 - 5. Final inspection at the completion of all work.
- B. Provide 48 hours advance written notice to the Owner and Architect, so they may have representatives attend the inspections.
- C. Submit the inspection reports within one week following each inspection.
 - 1. Payment requisitions will not be reviewed nor approved until the inspection reports are received.

END OF SECTION

SECTION 076110 - SHEET METAL SIDING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Custom-fabricated sheet steel siding panels:
 - a. Flat-seam metal siding panels.
 - b. Accessories.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 061000 ROUGH CARPENTRY for wood nailers, curbs, and blocking.
 - 2. Section 076200 SHEET METAL FLASHING AND TRIM for fasciae, copings, and flashings that are not part of sheet metal siding.
 - 3. Section 079200 JOINT SEALANTS for field-applied sheet metal siding sealants.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide complete sheet metal siding panels system, including, but not limited to, custom-fabricated metal siding pans, cleats, clips, anchors and fasteners, sheet metal flashing and drainage components related to sheet metal siding, fascia panels, trim, underlayment, and accessories as indicated and as required for a weathertight installation.
- B. Thermal Movements: Provide sheet metal siding panels that allows 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 siding panels 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, ambient; 180 deg F, material surfaces.
- C. Water Infiltration: Provide sheet metal siding panels that does not allow water infiltration to building interior, with metal flashing and connections of sheet metal siding panels lapped to allow moisture to run over and off the material.

1.4 SUBMITTALS

- A. Product Data: For each product indicated. Include details of construction relative to materials, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Show fabrication and installation layouts of sheet metal siding panels, including plans, elevations, and keyed references to termination points. Distinguish between shop- and field-assembled work. Include the following:
 - 1. Details for forming sheet metal siding panels, including seams and dimensions.
 - 2. Details for joining and securing sheet metal siding panels, including layout of fasteners, clips, and other attachments. Include pattern of seams.
 - 3. Details of termination points and assemblies, including fixed points.
 - 4. Details of expansion joints, including showing direction of expansion and contraction.
 - 5. Details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counter flashings.
 - 6. Details of special conditions.
 - 7. Details of connections to adjoining work.
 - 8. Details of the following accessory items, at a scale of not less than 1-1/2 inches per 12 inches:
 - a. Flashing and trim.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
 - 1. Sheet Metal siding panels: 12 inches long by actual pan width, including finished seam. Include fasteners, cleats, closures, and other attachments.
 - 2. Trim and Closures: 12 inches long. Include fasteners and other exposed accessories.
 - 3. Accessories: 12-inch-long Samples for each type of accessory.
- D. Qualification Data: For Installer and manufacturer.
- E. Maintenance Data: For siding system to include in maintenance manuals.
- F. Inspection Report: Copy of siding system manufacturer's inspection report of completed siding installation.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain components for siding system from or approved by siding system manufacturer.
- B. Sheet Metal siding panels Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.
- C. Preinstallation Conference: Conduct conference at Project site. Comply with requirements in Division 01. Review methods and procedures related to siding system including, but not limited to, the following:
 - 1. Meet with the Architect; Architect, Owner's insurer if applicable; testing and inspecting agency representative; siding Installer; siding system manufacturer's representative; deck

- Installer; and installers whose work interfaces with or affects siding, including installers of siding accessories.
- 2. Review methods and procedures related to siding installation, including manufacturer's written instructions.
- 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- 4. Examine substrate conditions and finishes for compliance with requirements, including flatness and fastening.
- 5. Review temporary protection requirements for siding system during and after installation.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sheet metal siding pans, components, and other sheet metal siding materials so as not to be damaged or deformed. Package sheet metal siding materials for protection during transportation and handling.
- B. Unload, store, and erect sheet metal siding materials 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. Store sheet metal siding materials to ensure dryness. Do not store sheet metal siding materials in contact with other materials that might cause staining, denting, or other surface damage.
- D. Protect strippable protective covering on sheet metal siding from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal siding installation.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit siding system to be installed according to manufacturer's written instructions and warranty requirements.

1.8 WARRANTY

- A. Special Installer's Warranty: Siding Installer's warranty, signed by Siding Installer, in which Siding Installer agrees to repair or replace components of custom-fabricated sheet metal siding that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures.
 - b. Loose parts.
 - c. Wrinkling or buckling.
 - d. Failure to remain weathertight, including uncontrolled water leakage.
 - e. Deterioration of metals, metal finishes, and other materials beyond normal weathering, including nonuniformity of color or finish.
 - f. Galvanic action between sheet metal siding and dissimilar materials.
 - 2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SIDING SHEET METALS

- A. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet in accordance with ASTM A653/A653M, G90 coating designation; with smooth, flat surface; prepainted by coil-coating process to comply with ASTM A755/A755M.
 - 1. Thickness: Nominal 0.022 inch unless otherwise indicated.
 - 2. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 3. Color: As selected by Architect from manufacturer's full range.
 - Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

2.2 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: 30 to 40 mils thick minimum, consisting of slipresisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
 - 1. Thermal Stability: Stable after testing at 240 deg F; ASTM D 1970.
 - 2. Low Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D 1970.
 - 3. Available Products:
 - Carlisle Coatings & Waterproofing, Div. of Carlisle Companies Inc.; Dri-Start "HR" High Performance Roofing Underlayment.
 - b. GCP Applied Technologies (formerly W.R. Grace); Vycor Ultra.
 - c. Henry Company; Perma-Seal PE.
 - d. Tamko Building Products: TW Metal and Tile Underlayment
- B. Slip Sheet: Building paper, minimum 5 lb/100 sq. ft., rosin sized.

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 a complete siding system and as recommended by fabricator for sheet metal siding.
- B. Fasteners: Self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
 - 1. Exposed Fasteners: Heads matching color of sheet metal siding by means of plastic caps or factory-applied coating.
 - 2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.

3. Blind Fasteners: Stainless steel rivets.

C. Solder:

- 1. For Zinc-Coated (Galvanized) Steel: ASTM B32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead
- D. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
- E. Elastomeric Joint Sealant: ASTM C 920, of base polymer, type, grade, class, and use classifications required to produce joints in sheet metal siding that will remain weathertight and as recommended by roll-formed sheet metal siding manufacturer for installation indicated.
- F. Expansion-Joint Sealant: For hooked-type expansion joints, which must be free to move, provide nonsetting, nonhardening, nonmigrating, heavy-bodied polyisobutylene sealant.
- G. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.4 ACCESSORIES

- A. Sheet Metal Siding Accessories: Provide components required for a complete sheet metal siding assembly including trim, copings, fasciae, corner units, ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of sheet metal siding, unless otherwise indicated.
 - 1. Closures: Provide closures at eaves and ridges, fabricated of same metal as sheet metal siding.
 - 2. Clips: Minimum 0.0625-inch-thick, stainless steel panel clips designed to withstand negative-load requirements.
 - 3. Cleats: For mechanically seaming into joints and formed from the following materials:
 - a. Metallic-Coated Steel or Aluminum Roofing: 0.0250-inch- thick stainless steel.
 - 4. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
- B. Flashing and Trim: Formed from same material and with same finish as sheet metal siding, minimum 0.0179-inch-thick. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
 - 1. Pipe and Penetration Flashing: Premolded, flashing sleeve or pipe collar with flexible metal ring bonded to sloped base. Intended to provide weatherproof seal and to isolate pipe movement from vibration and expansion/contraction.

2.5 FABRICATION

A. General: Custom fabricate sheet metal siding panels to comply with details shown and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions (pan width and seam height), geometry, metal thickness, and other characteristics

of installation indicated. Fabricate sheet metal siding and accessories at the shop to greatest extent possible.

- 1. Flat-Seam Siding: Form flat-seam pans from metal sheets 20 by 28 inches with 1/2-inch notched and folded edges.
- B. General: Fabricate roll-formed sheet metal siding panels to comply with details shown and roll-formed sheet metal siding manufacturer's written instructions.
- C. Fabricate sheet metal siding panels to allow for expansion in running work sufficient to prevent leakage, damage, and deterioration of the Work. Form exposed sheet metal work to fit substrates without excessive oil canning, buckling, and tool marks, true to line and levels indicated, and with exposed edges folded back to form hems.
 - 1. Lay out sheet metal siding panels so cross seams, when required, are made in direction of flow with higher pans overlapping lower pans. Stagger cross seams.
 - 2. Fold and cleat eaves and transverse seams in the shop.
 - 3. Form and fabricate sheets, seams, strips, cleats, valleys, ridges, edge treatments, integral flashings, and other components of metal siding panels to profiles, patterns, and drainage arrangements shown and as required for leakproof construction.
- D. 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 sealant (concealed within joints).
- E. Sealant Joints: Where movable, nonexpansion-type joints are indicated or required to produce weathertight seams, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.
- F. Metal Protection: Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturers of dissimilar metals or by fabricator.
- G. Sheet Metal Accessories: Custom fabricate flashings 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. Obtain field measurements for accurate fit before shop fabrication.
 - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 2. Seams: Fabricate nonmoving seams with flat-lock seams.
 - 3. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
 - 4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - 5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" for application but not less than thickness of metal being secured.

2.6 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, sheet metal siding panels supports, and other conditions affecting performance of work.
 - 1. Examine solid sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored, and that provision has been made for flashings, and penetrations through sheet metal siding panels.
 - 3. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
- B. Examine roughing-in for components and systems penetrating sheet metal siding panels to verify actual locations of penetrations relative to seam locations of sheet metal siding panels before sheet metal siding panels installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Install flashings and other sheet metal to comply with requirements specified in Section 076200 - SHEET METAL FLASHING AND TRIM.

3.3 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free, on sheathing under sheet metal siding panels. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply over entire area in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

- B. Install flashings to cover underlayment to comply with requirements specified in Section 076200 SHEET METAL FLASHING AND TRIM.
- C. Apply slip-sheet over underlayment before installing sheet metal siding panels.

3.4 INSTALLATION, GENERAL

- A. General: Install sheet metal siding panels perpendicular to purlins or supports. Anchor sheet metal siding panels and other components of the Work securely in place, with provisions for thermal and structural movement. Install fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for a complete siding system and as recommended by fabricator for sheet metal siding panels.
 - 1. Field cutting of sheet metal siding panels by torch is not permitted.
 - 2. Rigidly fasten eave end of sheet metal siding panels and allow ridge end free movement due to thermal expansion and contraction. Predrill siding.
 - 3. Provide metal closures at each side of ridge caps.
 - 4. Flash and seal sheet metal siding panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
 - 5. Locate and space fastenings in uniform vertical and horizontal alignment.
 - 6. Install ridge caps as sheet metal siding panels work proceeds.
 - 7. Locate siding splices over, but not attached to, structural supports. Stagger siding splices and end laps to avoid a four-panel lap splice condition.
 - 8. Lap metal flashing over sheet metal siding panels to allow moisture to run over and off the material.
- B. Fasteners: Use fasteners of sizes that will not penetrate completely through substrate.
 - 1. Steel Siding: Use stainless-steel fasteners.
- C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by fabricator of sheet metal siding panels or manufacturers of dissimilar metals.
- D. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- E. Fascia: Align bottom of sheet metal siding panels and fasten with blind rivets, bolts, or self-tapping screws. Flash and seal sheet metal siding panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

3.5 CUSTOM-FABRICATED SHEET METAL SIDING PANEL INSTALLATION

- A. Fabricate and install work with lines and corners of exposed units true and accurate. Form exposed faces flat and free of buckles, excessive waves, and avoidable tool marks, considering temper and reflectivity of metal. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant. Fold back sheet metal to form a hem on concealed side of exposed edges, unless otherwise indicated
 - 1. Install cleats to hold sheet metal panels in position. Attach each cleat with two fasteners to prevent rotation.

- 2. Nail cleats not more than 12 inches o.c. Bend tabs over nails.
- B. Seal joints as shown and as required for leakproof construction. Provide low-slope transverse seams using cleats where backup of moisture may occur.
 - 1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, 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.
 - 2. Prepare joints and apply sealants to comply with requirements in Section 079200 Joint Sealants.
- C. Provide expansion cleats in siding panels that exceed 30 feet in length.
- D. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches, except reduce pre-tinning where pre-tinned surface would show in completed Work.
 - 1. Do not solder metallic-coated steel or aluminum sheet.
 - 2. Do not pre-tin zinc-tin alloy-coated copper.
 - 3. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
- E. Flat-Seam Siding: Attach flat-seam metal pans to substrate with cleats, starting at eave and working upward toward ridge. After pans are in place, mallet seams and apply sealant.
 - 1. Attach metal base flashing with cleats spaced not more than 24 inches o.c. Lock and solder pans to base flashing.
 - 2. Attach edge flashing to face of roof edge with continuous cleat nailed at 12 inches o.c. and attach to substrate with cleats. Lock pans to edge flashing and apply sealant.

3.6 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
 - 1. Install components required for a complete sheet metal siding panels assembly including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
 - 1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
 - 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches

of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.7 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal siding panels within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.8 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
 - 1. Steel and Aluminum Materials: Clean off excess sealants.
- B. Remove temporary protective coverings and strippable films, if any, as sheet metal siding panels is installed. On completion of sheet metal siding panels installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.
- C. Replace panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 076200 SHEET METAL FLASHINGS & SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Applicable provisions of the Conditions of the Contract and Division 1, General Requirements, govern work in this Section.

1.2 DESCRIPTION OF WORK

- A. The work of this Section includes all plant, labor, materials, equipment, testing and services necessary to complete the work shown on the drawings, schedules and keynotes, as specified herein, and as may be required by conditions and authorities having jurisdiction, including, but not limited to, the following:
 - 1. Sheet metal work that is compatible with the roofing systems specified, including cap and through wall flashings, hook strips, fascia, drip edges, gravel stops, factory fabricated roof edge systems, leaders, wall panels and miscellaneous flashings.
- 1.3 RELATED WORK SPECIFIED ELSEWHERE Entire Project Specification with specific reference to those sections noted above and as follows:

A. 040100 Masonry Maintenance
B. 061000 Roof Carpentry
C. 075323 EPDM Roofing

D. 076200 Sheet Metal Flashing & Specialties

E. 077200 Roof Accessories

F. 013113 & Divisions 21, 22, 23 and 26 Mechanical and Electrical

1.4 CODE APPROVAL REQUIREMENTS

A. Fabricate and install roof perimeter flashings that comply with the NY State Uniform Fire Prevention and Building Code and with ANSI/SPRI ES-1 "Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems" requirements.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

- 1. A firm (Installer) with at least 5 continuous years experience performing work similar to that required for this project, employing personnel skilled in the work specified.
 - a. The Installer shall directly employ the personnel performing the work of this section.
 - b. The Installer shall have a supervisor on the roof when work is in progress. The Supervisor shall have a minimum of 5 years experience with work similar in nature and scope to this project, and speak fluent English.
 - 1. Submit the supervisor's resume upon request.

- 2. The Installer shall provide a reference list of at least three previously completed projects of comparable size and similar design, within fifty miles of this project, which may be observed by representatives of the Owner:
 - a. The reference list shall include at a minimum, the completion date, a description of the work performed, the Owner's name contact person phone number and address and the Architect's name contact person and phone number.
 - b. Submit the reference list upon request.

B. Material Quality:

- 1. Obtain each product from a single Manufacturer which has manufactured the same product in the United States of America for not less than 5 continuous years.
- 2. Obtain copper and pre-finished sheet metal items from the same mill run to maintain consistent color hue and surface finish.
- C. Pre-Construction Conference: Meet at the project site between one and two weeks prior to starting work, with the Architect, Owner and other representatives concerned about the work, to discuss the following:
 - 1. How the building will be kept watertight as work progresses.
 - 2. How sheet metal work will be coordinated with the installation of the vapor barrier, thermal barrier, insulation, cover board, roofing, flashings, roof accessories and other items to provide a watertight assembly.
 - 3. Generally accepted industry practice and the Manufacturer's instructions for handling and installing his products.
 - 4. The condition of the substrate, curbs, penetrations and other preparatory work needed.
 - 5. Incomplete submittals; note that progress payments will not be processed until all submittals are received and approved.
 - 6. The construction schedule, weather forecast, availability of materials, personnel, equipment and facilities needed to proceed and complete the work on schedule.
 - 7. A schedule for Manufacturer and Architect inspections.

1.6 SUBMITTALS

- A. Submit the following items far enough in advance to obtain approval prior to performing any work on site:
 - 1. A pre-work site and building inspection report with photos to document conditions before work starts.

- 2. Manufacturer's technical literature for all materials.
- 3. Test reports and certifications substantiating compliance with specification requirements if requested by the Architect.
- 4. Shop drawings, or 2 foot long samples, for each sheet metal item, to show how it relates and fits on adjoining masonry and wood blocking assemblies, and with the roof, stripping, and flashings.
- 5. 6 inch square pieces of each type of sheet metal to show surface finish, texture and color.
- 6. A sample of the Contractor's guarantee form.
- B. Simultaneously provide all technical submittals needed for this project, for all technical sections, collated by section. Incomplete submittals will not be reviewed.
 - 1. Submittals shall be prepared and made by the firm that will perform the actual work.
 - 2. Provide electronic submittals via an on-line submittal exchange program if one is established for this project; if an on-line program is not established, provide the submittals on portable USB drives in pdf format, organized in folders by Section.
 - a. Do not make technical submittals via email
 - b. Do not include Safety Data Sheets with the technical submittals.
- C. Safety Data Sheets: Simultaneously provide all Safety Data Sheets needed for this project, for all specification sections collated by section, in three ring binders. Provide two binders for each building.
- D. Payment requisitions will not be processed until all submittals are received and approved.

1.7 JOB MOCK-UPS

- A. After the submittals are approved, prepare in actual job locations, mock-ups of cap and through wall flashings, hook strips, drip edges, fascia, gravel stops, factory fabricated roof edge systems, copings, gutters, leaders, flat and standing seam panels, ridge covers, wall and soffit panels, and all other items of sheet metal and related work, for inspection and approval by the Architect.
- B. Construct each mock-up of two full lengths of metal, fastened, connected and stripped-in to the related roofing system, to show the following:
 - 1. Type, gauge, color, cross-sectional dimensions and shape, and joint and mitering techniques.
 - 2. Related masonry work, wood and light gauge metal blocking assemblies, and the attachment techniques and fasteners for all wood and metal components.

- 3. Other sheet metal related materials and their installation techniques to fully define the detailing of each mock-up.
- C. Mock-ups shall be constructed to establish the minimum standard of materials and workmanship, and to assure that completed work which matches the mock-ups will be fully functional and serve the purpose for it has been designed.
- D. Approved mock-ups may be left in place and incorporated into the permanent installation. Rejected mock-ups shall be removed and replaced until an acceptable mock-up is approved.
- E. Do not purchase or fabricate sheet metal items until mock-up installation, inspection and approval are completed and approval is documented in writing.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver material to the site in the Manufacturer's original and unopened packaging, with intact and legible labels which identify the products and Manufacturers,
- B. Cover all stored materials with watertight tarpaulins installed immediately upon delivery.
- C. Do not overload the structure when storing materials on the roof.
- D. Protect roof surfaces where material and equipment are placed on them, and where construction traffic occurs, with 6 mil fire retardant polyethylene, covered with 1-1/2 inch thick foam insulation, overlaid with 2 by 10 wooden planks.

1.9 GUARANTEE

- A. Provide a written Contractor's Guarantee which guarantees that all work will remain free of material and workmanship defects and in a watertight condition for five years beginning upon Final Completion:
 - 1. Defects include but are not limited to the following: peeling paint, leakage, adhesive separation, delamination, lifting, loosening, splitting, cracking, and undue expansion.
 - 2. Guarantee coverage shall include the repairs and modifications necessary to enable the work to perform as guaranteed.
 - 3. Guarantee coverage shall include removing and replacing materials installed as part of the original work, if removal is needed to affect guaranteed repairs.
 - 4. Guarantee coverage shall have no dollar limit.
- B. Provide one Contractor's Guarantee that covers "all work performed" when a single contractor is awarded work specified in multiple Sections.
- C. The Guarantee coverage shall take affect no more than 30 days before the completion of all punch list work.

D. The Contractor's Surety Company may add a rider to the Performance Bond which clarifies that Bond Coverage expires two years after Final Completion; i.e., Performance Bond Coverage does not run for the five year term of the Contractor's Guarantee.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Name brand products are specified to establish a basis of design quality; equal products from other manufacturer's may be submitted and used.
- B. Copper sheet: ASTM B370, 99.0 % pure copper, thickness 16 ounces per square foot. Use copper for all metal items not otherwise indicated
- C. Zinc-Tin coated copper: copper sheet, coated on both sides, with a smooth uniform coating of zinc and tin, base metal weight 16 ounces per square foot, cold rolled temper, available as FreedomGray Copper by Revere.

D. Solder:

- 1. 50-50 tin and lead for plain copper, supplied in one pound bars with the alloy mixture stamped into the bar by the Manufacturer.
- 2. Lead free / or pure tin solder for zinc-tin coated copper, Number 497 by Johnson Manufacturing.

E. Flux:

- 1. Water-Soluble Liquid Flux, Kester #3345 for iron soldering of brass and copper.
- 2. Tin-bearing flux such as "Flux-N-Solder E127 with pure tin" by Johnson Manufacturing.

F. Anodized aluminum main roof fascia:

- 1. Aluminum roof fascia trim shall be given caustic etch followed by an Architectural Class I anodic coating with color conforming to the standards set forth by AAMA 611, as selected by the Architect from the full range of standard and custom colors.
- 2. Southern Aluminum Finishing Co., Inc., SAFINISH
- Coating shall be continuous, uniform in appearance, and free from scratches and other blemishes.
- 4. Color variation shall be no more than 5E (CMC) when measured in accordance with AATCC 173-1989.
- G. Shop fabricated aluminum fascias, hook strips, and miscellaneous trim for all other roof areas with #3105-H14 alloy aluminum, minimum thickness .040 inches unless otherwise indicated, factory finished with a Fluoropolymer Kynar 500 finish, color as selected by the Architect, from the full range of custom and standard colors.
- H. Factory Fabricated Roof Edge System: Extruded aluminum anchor bars secured with #9 stainless steel screws spaced 12 inches on center and .050 inch thick Kynar 500 prefinished aluminum trim covers, independently tested to comply with the ANSI / SPRI ES-1 Wind Design Guide, provided by the roofing membrane manufacturer.

- I. Fasteners: fabricated of stainless steel, or material that matches the sheet metal being fastened.
- J. Water barrier underlayment: minimum 10.2 mil thick, self- adhesive, asphalt free, UL Class A rated sheet BlockShield SA by VaproShield.
- K. Glass Cloth: open mesh glass fabric coated on each side with plasticized asphalt as manufactured by Karnak Corporation or equal.
- L. Asphalt cement: Federal Specification SS-C-153B, Type 1, asbestos free grade.
- M. Exterior mounted leaders and straps: .032 inch thick rectangular corrugated aluminum leaders factory finished with baked acrylic enamel. Fasten each leader with 1/16 inch thick by 1 inch wide straps spaced 7 feet on center. Install aluminum wire baskets at all leader outlet tubes.
- N. Sealant: High performance, solvent free, formulated and moisture curing silyl-terminated polyether sealant, ASTM C-920, Type S, Grade NS, Class 25, NovaLink construction sealant by ChemLink, color as selected.
- O. Metal panels: .032 inch thick V-groove profile interlocking aluminum panels with concealed fasteners, baked acrylic enamel paint finish, color as selected, manufactured by Fabral under the trade name Posi-Lock, or Firestone UnaClad UC-750
- P. Z Sections: nominal 1 inch deep 20 gauge galvanized steel sections.

PART 3 - EXECUTION

3.1 GENERAL

- A. Accurately reproduce the details and design shown, and form profiles, bends and intersections, sharp, true and even. Fabricate sheet metal in the shop whenever possible, and form joints, laps, splices and connections to shed water and condensation in the direction of flow.
- B. Provide any miscellaneous flashing and sheet metal work not shown on the drawings but otherwise needed to leave the project complete and entirely watertight, neatly and carefully executed in a thorough and workmanlike manner.

3.2 INSPECTION

A. Examine surfaces to receive work of this section and report any defects to the Owner. Commencement of work will be construed as complete acceptance of surfaces.

3.3 INSTALLATION

A. Securely fasten and anchor all work, and make provisions for thermal expansion. Submit details of expansion joints for approval. Install fasteners through one edge of metal only, use a hook strip on the other edge.

- B. Fabricate and install copper work in accordance with the current edition of "Copper and Common Sense" as published by the Revere Copper and Brass Company, unless otherwise indicated.
 - 1. Form all joints, except loose locked sealant filled expansion joints, to overlap 2 inches.
 - 2. Secure the joints with rivets spaced 1 inch on center positioned about 1/2 inch from the top edge of the joint, then sweat solder the joint.
 - 3. Use solder only to fill and seal the joint, not for mechanical strength. Form soldered joints continuous, strong and free from defects, with well heated soldering irons. Do not use open flame torches for soldering.
 - 4. Clean soldered joints daily, immediately after soldering, by washing them with soap and water applied with a soft bristle brush, then rinsing with clear water.
- C. Use stainless steel pin Zamac type nail-in fasteners, or stainless steel screws and washers with neoprene inserts where fasteners will be exposed.

3.4 CAP FLASHINGS

- A. Install new copper cap flashings above all roof and roof flashing components, including copings, wall penetrating ducts and gravel stops. Install cap flashings built into masonry walls; as they are partially and re-constructed properly joined to all related materials in a watertight manner.
 - 1. Solder all joints in the new cap flashing, as described above, except form 2 inch wide flat locked sealant filled expansion joints a maximum of 32 feet on center.
 - 2. Form the flashing to turn up 2 inches inside the wall and finish with a hem on the bottom exposed edge.
 - 3. Fasten the top edge of the cap flashing to the back up masonry 12 inches on center.
 - 4. Install the new cap flashing under flexible type wall flashings where possible. Where it is not possible to lap the new cap flashing under an existing wall flashing, install a ply of glass cloth set in and coated with asphalt cement to connect the new cap flashing to the existing wall flashing.
 - 5. In the absence of an existing wall flashing, or at a solid masonry wall, turn up the new cap flashing 2 inches behind the first wythe of masonry.
 - 6. Install new cap flashings at a height of 10 to 12 inches above the roof and underlying flashing surfaces.
 - 7. Install new cap flashings above parapet flashings and above eave metal at transitions with higher walls.
- B. Install new aluminum cap flashings on skylight and equipment curbs.
 - 1. Form the cap flashing to extend at least 2 inches under the equipment or skylight, 4 inches over the base flashing, and finish with a 1/2 inch hem on the bottom edge.

- 2. Install a 1/2 inch thick by 2 inch wide continuous foam gasket between the cap flashing and mechanical equipment or skylight. Do not set the equipment or skylight in sealant.
- 3. Secure the equipment or skylight to the curb with stainless steel screws spaced 12 inches on center.

3.5 HOOK STRIPS

- A. Form continuous hook strips with locks that engage the superimposed trim piece a minimum of 3/4 inch, and to cover the entire underside edge of the wood blocking and neatly extend to the building wall.
- B. Fasten hook strips along their bottom edge, just above the 45 degree bend, with nails spaced 4 inches on center into underlying wood blocking; Zamac type nail-in type fasteners spaced 8 inches on center into masonry surfaces, or screws spaced 8 inches on-center into sheet metal surfaces.

3.6 FASCIA

A. Fabricate new fascia to engage the hook strip 3/4 inch minimum and extend to the top of the wood fascia blocking. Secure the fascia with a continuous hook strip along the bottom edge and roofing nails along the top edge spaced 8 inches apart, positioned to be covered by the roof edge trim. Form joints in the fascia with 6 inch wide concealed under plates which duplicate the profile of the fascia. Set the underplates in a full bed of sealant.

3.7 ROOF EDGE SYSTEM

- A. Install a factory fabricated roof edge system on all roof eaves.
 - 1. Extend the roof to lap over and down the face of the fascia trim, to shed water and so it stops just short of the bottom edge of the anchor bar.
 - 2. Install the anchor bar straight, level and true, set in a full bed of sealant, and secure the bar with #9 by 2 inch long stainless steel screws spaced no more than 12 inches apart.
 - 3. Pre-drill screw holes in the underlying metal fascia trim where extra fasteners are needed, and at corners and special conditions.
 - 4. Install color matching under plates at each joint in the roof edge trim; set the under plates in a full bed of sealant.

3.8 WALL PANELS

- A. Install Z sections at the top and bottom and in equally spaced horizontal rows in between, a maximum of 2 feet on center, to support the panels.
 - 1. Fasten each Z sections to the substrate with screws or Zamac nail-ins (depending on substrate) spaced 12 inches on center.
- B. Install isocyanurate insulation between the Z sections, with tight joints.
 - 1. Install fully adhered EPDM roof flashings to cover the insulation.

- C. Install the panels plumb, level, and straight with seams parallel, to achieve the design appearance indicated.
 - 1. Fasten the panels to each hat section with concealed stainless steel screws in each seam, and with exposed screws in each V-groove only along the bottom edge, spaced 6 inches on center.

3.9 FASCIA TRIM

- A. Install fully adhered Water Barrier over the entire surface of the plywood substrate. Overlap all joints 3 inches minimum, to shed water.
- B. Install panels plumb, level, and straight with seams parallel, to achieve and aesthetically acceptable appearance. Utilize hidden hook strips and fasteners, and under-plates that match the color of the trim..

3.10 DOWNSPOUTS

- A. Install the downspouts plumb and straight, extending from a drop tube in the gutter to the underground drain hub.
 - 1. Secure the downspouts approximately 7 feet on center, with .050 inch thick by 1-1/4 inch wind straps color to match the downspouts. Fasten each strap with 1/4 inch diameter Zamac nail-in anchors, with stainless steel pins.
 - 2. Install aluminum wire basket strainers at all leader drop tube outlets.

3.11 CLEANING, PROTECTION AND WATERTIGHTNESS

- A. Inspect the interior and exterior of the building and grounds, and submit a written report with photos to document any pre-existing leaks or damage, prior to performing any other work on site.
- B. The Owner will conduct a similar inspection at the completion of the work, and the Contractor will be charged for all leaks and damage that weren't documented in the Contractor's report, or repaired to the Owners satisfaction at the Contractor's expense.
- C. Provide any equipment, material and labor necessary to protect the site, the building, its contents and occupants, pedestrians, and surrounding landscaped and paved areas from damage due to the construction work or from inclement weather during construction.
- D. Do not perform work during inclement weather. Protect incomplete work and the building from damage by inclement weather which may occur unexpectedly. Make all work areas watertight at the end of each day's work.
- E. Clean up all litter, refuse, rubbish, scrap materials and debris at least twice a day; at noon and at the end of the work day, so the roof and site are neat, orderly and workmanlike. Place the debris in a dumpster, and remove the dumpster from the site as soon as it is full or no longer being used.

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F. Carefully and thoroughly clean the entire roof to remove all residual debris when all work is complete. After cleaning the roof, thoroughly clean all drain sumps, drain lines, leader heads and leaders. Do not allow debris to enter the drainage system.

END OF SECTION

SECTION 077200 ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Applicable provisions of the Conditions of the Contract and Division 1, General Requirements, govern work in this Section.

1.2 DESCRIPTION OF WORK

- A. The work of this Section includes all plant, labor, materials, equipment, testing and services necessary to complete the work shown on the drawings, schedules and keynotes, as specified herein, and as may be required by conditions and authorities having jurisdiction, including, but not limited to, the following:
 - 1. Roof specialties that are compatible with the roofing systems specified, including:
 - a. Plastic skylights.
 - b. Pre-fabricated curbs and equipment supports.
 - c. Factory fabricate pipe curb portals
 - d. Drains, drain pipes and couplings.
 - e. Pipe insulation and fitting covers.
 - f. Aluminum smoke vent hatches.
 - g. Aluminum access hatches.
 - h. Hatch safety rails.
 - i. Galvanized steel roof access ladders and stairs.
 - j. Gas line and equipment pipe supports.
 - k. Roof walkway pads and concrete pavers.
 - I. Guard rail assemblies.
 - 2. Prepare, prime and paint existing roof top equipment, including the access ladders, equipment support dunnage, bulkhead doors and frames (inside and outside) and other miscellaneous rooftop items.
- 1.3 RELATED WORK SPECIFIED ELSEWHERE Entire Project Specification with specific reference to those sections noted above and as follows:

A. 040100 Masonry Maintenance

B. 061000 Roof CarpentryC. 075323 EPDM Roofing

D. 076200 Sheet Metal Flashing & Specialties

E. 077200 Roof Accessories

F. 013113 & Divisions 21, 22, 23 and 26 Mechanical and Electrical

1.4 CODE APPROVAL REQUIREMENTS

A. Fabricate and install roof accessories that comply with the NY State Uniform Fire Prevention and Building Code.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

- 1. A firm (Installer) with at least 5 continuous years experience performing work similar to that required for this project, employing personnel skilled in the work specified.
 - a. The Installer shall directly employ the personnel performing the work of this section.
 - b. The Installer shall have a supervisor on the roof when work is in progress. The Supervisor shall have a minimum of 5 years experience with work similar in nature and scope to this project, and speak fluent English.
 - 1. Submit the supervisor's resume upon request.
- 2. The Installer shall provide a reference list of at least three previously completed projects of comparable size and similar design, within fifty miles of this project, which may be observed by representatives of the Owner:
 - a. The reference list shall include at a minimum, the completion date, a description of the work performed, the Owner's name contact person phone number and address and the Architect's name contact person and phone number, and the Contractor's Supervisor's name.
 - b. Submit the reference list upon request.
- B. Material Quality: Obtain each product from a single Manufacturer which has manufactured the same product in the United States of America for not less than 5 continuous years.
- C. Pre-Construction Conference: Meet at the project site between one and two weeks prior to starting work, with the Architect, Owner and other representatives concerned about the work, to discuss the following:
 - 1. How the building will be kept watertight as work progresses.
 - 2. How roof accessory work will be coordinated with the installation of the vapor barrier, thermal barrier, insulation, cover board, roofing, flashings, and other items to provide a watertight installation.
 - 3. Generally accepted industry practice and the Manufacturer's instructions for handling and installing his products.
 - 4. The condition of the substrate, curbs, penetrations and other preparatory work needed.
 - 5. Incomplete submittals; note that progress payments will not be processed until all submittals are received and approved.
 - 6. The construction schedule, forecast weather, availability of materials, personnel, equipment and facilities needed to proceed and complete the work on schedule.

7. A schedule for Manufacturer and Architect inspections.

1.6 SUBMITTALS

- A. Submit the following items far enough in advance to obtain approval prior to performing any work:
 - A pre-work site and building inspection report with photos to document conditions before work starts.
 - 2. Manufacturer's installation instructions and technical data sheets for each item. Material sample submittals are not needed unless requested to show color and texture.
 - 3. Samples of the Contractor's and Manufacturer's guarantee/warranty forms.
 - 4. Test reports and certifications substantiating compliance with specification requirements if requested by the Architect.
- B. Simultaneously provide all roof related submittals needed for this project, for all technical sections, collated by section. Incomplete submittals will not be reviewed.
 - 1. Submittals shall be prepared and made by the firm that will perform the actual work.
 - Provide electronic submittals via an on-line submittal exchange program if one is established for this project; if an on-line program is not established, provide the submittals on portable USB drives in pdf format, organized in folders by Section.
 - a. Do not make technical submittals via email
 - b. Do not include Safety Data Sheets with the technical submittals.
- C. Safety Data Sheets: Simultaneously provide all Safety Data Sheets needed for this project, for all specification sections collated by section, in three ring binders. Provide two binders for each building.
- D. Payment requisitions will not be processed until all submittals are received and approved.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver material to the site in the Manufacturer's original and unopened packaging, with intact and legible labels which identify the products and Manufacturers,
- B. Cover all stored materials with watertight tarpaulins installed immediately upon delivery.
- C. Do not overload the structure when storing materials on the roof.
- D. Protect roof surfaces where material and equipment are placed on them, and where construction traffic occurs, with 6 mil fire retardant polyethylene, covered with 1-1/2 inch thick foam insulation, overlaid with 2 by 10 wooden planks.

1.8 GUARANTEE

- A. Provide a written Contractor's Guarantee which guarantees that all work will remain free of material and workmanship defects and in a watertight condition for five years beginning upon Final Completion:
 - 1. Defects include but are not limited to the following: peeling paint, leakage, adhesive separation, delamination, lifting, loosening, splitting, cracking, movement and undue expansion.
 - 2. Guarantee coverage shall include the repairs and modifications necessary to enable the work to perform as guaranteed.
 - 3. Guarantee coverage shall include removing and replacing materials installed as part of the original work, if removal is needed to affect repairs.
 - 4. Guarantee coverage shall have no dollar limit.
- B. Provide one Contractor's Guarantee that covers "all work performed" when a single contractor is awarded work specified in multiple Sections.
- C. The Guarantee shall take affect no more than 30 days before the satisfactory completion of all punch list work.
- D. The Contractor's Surety Company may add a rider to the Performance Bond which clarifies that Performance Bond Coverage expires two years after Final Completion; i.e., Performance Bond Coverage does not run for the entire five year term of the Contractor's Guarantee.
- E. Provide a Manufacturer's written warranty, which warrants the skylights and roof hatches will remain watertight for a minimum of 5 years, beginning upon final completion.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Name brand products are specified to establish the basis of design quality. Equal products from other manufacturers may be submitted for approval and used.
- B. Provide Manufacturer's standard units, modified as necessary to comply with the specified requirements. Fabricate each unit in a shop to the greatest extent possible, using the following components:
 - 1. Aluminum Sheet: ASTM B 209 alloy 3003, tempered for forming and performance; mill finish, except as otherwise noted.
 - 2. Extruded Aluminum: Standard extrusions alloy 6063-T52; 0.078 inch minimum thicknesses for primary framing and curb member legs, 0.062 inch thickness for secondary framing and covers; mill finish, except as otherwise indicated.
 - 3. Insulation: Rigid fiber glass boards where encapsulated inside metal skirts, rigid isocyanurate where covered with roof flashings on the exterior of curbs.
 - 4. Wood Nailers: Dimension grade Douglas Fir, not less than 1-1/2 inches thick.

- 5. Fasteners: Nonmagnetic stainless steel or hot dipped galvanized steel, to match the finish of the material being fastened.
- 6. Gaskets: Tubular neoprene or polyvinyl chloride, or block sponge neoprene.
- 7. Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

2.2 PLASTIC SKYLIGHTS

- A. Factory assembled dome and aluminum frame assemblies with welded corners manufactured by Kingspan / Bristolite or American Skylights are specified to establish a quality standard. Equal products are acceptable provided they comply with the following requirements:
 - Glazing sheet thickness required for a minimum of 30 pounds per square foot external and 30 pounds per square foot internal loading; and to comply with the minimum thickness and wind pressure requirements of AAMA/WDMA/CSA 101/I.S.2/A440 as set forth in paragraph 2405.5 of the NYS Uniform Fire Prevention and Building Code.
 - 2. Outer Dome: Dome shaped polycarbonate meeting the following tests:

a. Burn Rate ASTM D635 - Not over 2.5

b. Smoke Developedc. Smoke DensityASTM D2843Not over 75%

3. Inner Panel: Clear multiwall polycarbonate panel meeting the following tests:

a. Burn Rate ASTM D635 - Not over 2.5

b. Smoke Developedc. Smoke DensityASTM D2843Not over 75%

- 4. Fall Protection: Fabricate the skylights so the dome and panel will not disengage from the frame upon impact of 755 foot pounds, and to comply with OSHA 1910.23 Fall Protection Guidelines.
- 5. Energy Performance Ratings:
 - a. Maximum U-Value 0.50
 - b. Maximum Solar Heat Gain Coefficient (SHGC) of 0.40
- B. Curb Construction: Provide units with integral internal gutters and weep holes to drain condensation; fabricated with formed and extruded thermally broken welded aluminum frames and retaining angles for installation on field constructed curb assemblies.
- C. Safety Screens: 4 inch by 4 inch 6 gauge welded wire screens and 1/4 inch thick 1-1/2 by 1-1/2 steel perimeter angle support frames, fabricated to fit within the skylight curb to protect the skylights from underside damage and increase fall protection.
 - 1. Prime and paint the screens flat white before installation.
 - 2. Install screens at skylights above gymnasiums.
 - 3. Install screens at over-sized skylights where the glazing does not provide fall protection.

2.3 PRE-FABRICATED CURBS AND EQUIPMENT SUPPORTS

- A. Factory fabricated of welded 14 gauge galvanized steel, insulated with minimum 1-1/2 inch thick 3 pound density rigid insulation, with nominal 2 by 2 inch wood nailers and T bar reinforcing on sides longer than 36 inches; height to extend above the finished roof surface a minimum of 10 inches, Model ES-2 by Pate Inc.
- B. Where the roof deck slopes more than 1/4 inch per foot, provide tapered curbs to match the slope, and install the equipment level.

2.4 FACTORY FABRICATED PIPE CURB PORTALS

A. Factory fabricated flashing systems, consisting of 9 inch high internally insulated galvanized steel curbs with 1-1/2 inch square wood nailers at the top edges, and 5 hole EPDM boots, with nipples that will accommodate pipes and conduits from 1/2 to 2-1/2 inches in diameter, with stainless steel hose clamps on each nipple - 5-Hole Pipe Portal Flashing System: C-555, by Portals Plus or equal.

2.5 DRAINS, DRAIN PIPES, AND COUPLINGS

- A. Conventional cast iron bottom and side outlet roof drains, installed with drain receivers, under deck clamps, cast iron strainers, cast iron clamping rings and factory installed stainless steel gravel screens Series 1011 as manufactured by Jay R. Smith Manufacturing Company.
- B. Match the drain outlet size and style to the building drain line, except if the drain line is a copper pipe, then furnish the drain body with a threaded outlet and use a male adapter to connect the drain body to the drain line.
- C. Drain pipe: cast iron pipe with no hub fittings, minimum 3 inch diameter, and larger to match the existing building drain lines.
- D. No-hub couplings: heavy duty rubber neoprene sleeve couplings with full length Type 304 stainless steel shields and at least 4 worm drive clamps, conforming to ASTM A564.

2.6 PIPE INSULATION AND FITTING COVERS

- A. Insulation: minimum 1 inch thick pre-molded 3.5 lb. heavy density fiberglass pipe insulation with UL rated non-combustible service jackets.
- B. .030 inch thick factory fabricated white PVC "Smoke Safe" fitting and drain bowl covers as manufactured by the Speedline Corporation, with a maximum Flame Spread Value of 25 and a maximum Smoke Developed Value of 50 in accordance with ASTM E8450.

2.7 ALUMINUM SMOKE VENT HATCHES

A. UL listed single and double leaf hatches constructed with welded double wall 11 gauge mill finish aluminum covers that incorporate insulation, and 12 inch high aluminum curbs complete with counter flashings, neoprene draft seals, 3-1/2 inch

deck flanges, interior and exterior handles and tamper resistant hinges contained within the hatch, as manufactured by The Bilco Company.

- 1. Furnish the units with manual, fusible link and electric releases that can be reset without having to replace any parts.
 - a. Match the electric release voltage to the local smoke detector and alarm system.
- 2. Furnish the hatches with 4 inch by 4 inch, 6 gauge galvanized steel welded wire safety screens supported on 1-1/2 by 1-1/2 by 1/4 inch thick steel perimeter angle support frames.
- 3. Furnish the units in the sizes needed to fit the deck openings, and as indicated.

2.8 ALUMINUM ACCESS HATCHES

A. Hatches constructed of welded 11 gauge mill finish aluminum, with 12 inch high curbs and integral cap flashings, heavy pintle hinges, compression spring operators, a spring latch with interior and exterior handles, an interior padlock hasp, and stainless steel hardware, as manufactured by the Bilco Company, in the sizes needed to fit the deck openings, and as indicated.

2.9 HATCH SAFETY RAILS

- A. Safety rails shall comply with OSHA Standard CFR 29 1910.23 and CFR 29 1910.27
- B. Safety rails shall be bolted to the exterior surface of the curb above the flashing with 3/8 inch diameter stainless steel bolts, constructed of 1-1/2 inch diameter hot rolled electrically welded tubing meeting ASTM A500 Grade B, sized and configured to provide a safety railing on four sides of the hatch 42 inches above the roof surface with a self closing gate supported with heavy duty hinges with 5/8 inch diameter pins basis of design: Roof Hatch Safety Rails by SafePro Roof Top Fall Protection.
- C. Gate shall be fabricated of galvanized steel tubing, with no chains or latches.
- D. Gate shall be powder paint coated, color shall be as selected by the Architect

2.10 GALVANIZED STEEL ROOF ACCESS LADDERS AND STAIRS

- A. Fabricate ladders from 1-1/4 inch inside diameter steel pipe rails, spaced 22 inches apart, and 3/4 inch solid steel rebar rungs spaced 12 inches on center. Fit the rungs into drilled holes in the centerline of the rails, weld and grind the welds smooth. Extend the ladder rails and form goose-neck returns to finish 42 inches above the roof surface.
 - 1. Hot dip galvanize coat the ladder and mounting brackets after fabrication. Install with Type 316 stainless steel hardware.

- B. Fabricate stairs from C 10 x 15.3 steel stringer channels, McNichols Standard Serrated Non-Slip Bar Grating Stair Treads and 1-1/4 inch inside diameter steel pipe railings.
 - 1. Use treads formed with 1-1/4 by 3/16 inch bearing bars spaced 1-3/16 inches on center and cross bars spaced 4 inches on center for treads up to 36 inches wide.
 - 2. Use treads formed with 1-1/2 by 3/16 inch bearing bars spaced 1-3/16 inches on center and cross bars spaced 4 inches on center for treads over 36 inches wide.
 - 3. Weld and grind all welds smooth.
 - 4. Hot dip galvanize the stringer channels, railing and mounting brackets after fabrication. Assemble and install stair assemblies with Type 316 stainless steel hardware.

2.11 GAS LINE, CONDUIT AND EQUIPMENT PIPE SUPPORTS

A. Factory fabricated adjustable pipe supports as manufactured by Miro Industries, Inc. Model 20-Base Strut-12.

2.12 ROOF WALKWAY PADS AND CONCRETE PAVERS

- A. 2 inches thick, 24 inches by 24 inches precast concrete pavers, natural buff color and finish, minimum 7500 psi compressive strength as manufactured by Hanover Architectural Products.
- B. 30 inches by 30 inches hard rubber black walkway pads manufactured by Elevate / Firestone.

2.13 GUARD RAIL ASSEMBLIES

- A. Shop fabricate new solid steel tube bases, welded to 1/4 inch thick steel plates.
- B. Refurbish and reuse the superimposed railing assembly. Wire brush it to remove rust and existing loose paint, then prime the railing and install two finish coats of paint.

2.14 PAINT AND PRIMER

A. Alkyd base rust inhibiting exterior primer and high gloss finish paint for ferrous metal surfaces as manufactured by Sherwin Williams or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Field measure existing openings. Comply with manufacturer's instructions and recommendations. Coordinate with the installation of roof deck, other substrates to receive specialty units, vapor barriers, roof insulation, roofing and flashing to ensure

that each element of the work performs and fits 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.

3.2 PLASTIC SKYLIGHTS

- A. Skylights on field constructed curbs: Remove the existing skylight and curb assembly using care not to damage the roof deck or skylight well liner. Re-support ceiling and shaft components that are attached to the skylight curb or shaft liner. Construct or extend the existing curb to finish 10 inches above the roof surface. Install new base and cap flashings, and restore & finish the shaft liner to match the original construction. Install the new skylight on top of a 1/2 inch by 2 inch foam gasket.
- B. Safety Screens: Install new safety screens to fit inside the skylight curbs at skylights installed above gymnasiums, elsewhere where indicated, and to meet OSHA Fall Protection Guidelines where oversize plastic skylights lack integral fall protection. Wire brush, prime and install two finish coats of paint on the screens prior to installation. Fasten the screens with 3/8 inch diameter lag bolts spaced 12 inches on center around the entire perimeter of the screens.

3.3 PRE-FABRICATED CURB AND EQUIPMENT SUPPORTS

- A. Install curb assemblies directly on the structural deck or block solid under the assembly to achieve the height shown and to install the curb assembly level.
- B. Install new base and cap flashings prior to installing the mechanical equipment. Set mechanical equipment on 1/2 inch thick anti vibration pads.

3.4 FACTORY FABRICATED PIPE CURB PORTALS

- A. Install factory fabricated pipe portal flashing systems at all HVAC units, and where more than one pipe or conduit penetrates the roof.
 - 1. Install the portal curbs on wood blocking that matches the thickness of the roof insulation.
 - 2. Disconnect and reconnect refrigerant, power, control and condensate lines and pipes as needed to install the pipes through the flashing nipples.
 - a. Install water cut off sealant between the lines / pipes and EPDM nipples, and then install a hose clamp on each nipple.
 - b. Remove and replace nipples that are incorrectly cut too large.

3.5 DRAINS, DRAIN PIPES AND COUPLINGS

- A. Remove and replace the existing drains where roof removal and replacement work is indicated:
 - 1. Remove the existing drains and flashings; use care not to break or disturb the drain pipes within the building.

- 2. Modify the existing drain lines to properly connect to the new drain assemblies.
- 3. Enlarge the hole in the deck and reinforce the deck to accommodate the new drain, and install the drain recessed below the roof surface to achieve maximum drainage.
- 4. Support the drain with a stamped sump drain receiver, secure it with an under deck clamp and patch the deck around the new drain.
- 5. Connect the new drain to the existing drain line to conform to all applicable codes, and insulate the underside of the drain body and drain line.
- B. Note where existing drains are being relocated and where additional drains are being installed. Reinforce the underside of the deck at new drain locations. After installing the drains as described above, install new drain pipe to connect each new drain to the existing storm sewer system.
- C. Connect the fittings and sections of cast iron pipe using heavy duty no-hub couplings; solvent weld PVC fittings and pipe, and use threaded connections to join steel fittings and pipe.
- Install new drain pipes to slope 1/4 inch per foot, and support each section of pipe with a hanger, supported on a structural member or strut, on each side of every coupling.
 Do not rely on the couplings to support any weight. Do not hang the drain pipes from the roof deck.

3.6 PIPE INSULATION AND FITTING COVERS

- A. Install insulation on horizontal drain piping, and on new vertical pipes installed to connect the new drains to the existing lines.
- B. Install insulation on the undersides of the new drains.
- C. Install white PVC fitting and drain bowl covers, and wrap the joints between fitting covers and pipe insulation jackets with 3 inch wide white PVC tape.

3.7 ROOF HATCHES AND GUARD RAILS

- A. Carefully remove existing roof hatch assemblies, wood blocking and shaft lining components.
- B. Block solid under the hatch curb to support it at the level of the new roof; extend and restore the shaft liner.
- C. Orient the hatches for proper egress, and install new flashings.
- D. Install guard rails, fastened to the hatch frame, above the roof flashings.

3.8 SMOKE VENT HATCHES

- A. Remove the existing smoke hatch assemblies and related flashings
- B. Support the new smoke vent curbs on solid wood blocking that matches the height of the new roof.
- C. Connect the smoke vent hatches to a local smoke detector and the existing smoke alarm system. Test the smoke hatches to the satisfaction of the Architect and Owner.
- D. Install new safety screens to fit inside the curb openings. Wire brush, prime and install two finish coats of paint prior to installation. Fasten the screens with 5/16 inch diameter lag bolts / expansion bolts / epoxy set bolts spaced 12 inches on center around the entire perimeter of the screens.

3.9 GALVANIZED STEEL ROOF ACCESS LADDERS & STAIRS

- A. Install ladders at the interior and exterior locations shown. Support and secure each ladder at the top and bottom and at intermediate points spaced a maximum of 5 feet on center. Use bolted steel brackets, anchored with 1/2 inch diameter stainless steel epoxy set bolts. Space the ladders to provide 7 inches of toe clearance. Extend the rails 42 inches and goose-neck form them to provide additional support at the top of the ladder.
- B. Install new stairs at the exterior locations shown. Set the stairs on new concrete pavers over walkway pads. Secure the stairs to the pavers with stainless steel Zamac Nail-ins.

3.10 GAS LINE AND EQUIPMENT PIPE SUPPORTS

- A. Install pipe supports spaced five feet on center over a concrete paver and a walkway pad.
- B. Fasten pipes and conduits to the new pipe supports with new stainless steel clamps.

3.11 ROOF WALKWAY PADS AND CONCRETE PAVERS

- A. Install hard rubber walkway pads to provide a path 2-1/2 feet wide where shown, and at all roof access points, i.e., doors, ladders and hatches, under concrete pavers used for conduit & pipe supports, under concrete pavers used to support stairs at the bulkhead access doors, and around all HVAC equipment.
 - 1. Adhere each pad with five self adhesive strips do not install the pads using three strips of tape as supplied by the manufacturer.
 - 2. Install concrete pavers spaced 5 feet on center for conduit supports.

3.12 GUARD RAIL ASSEMBLIES

A. Carefully disassemble and save the existing guardrail assembly.

- B. Install new guardrail support posts, anchored to the roof deck to resist an individual point load of 200 pounds; and reinstall the existing guardrail on the new posts.
- C. Carefully cut and cope all connections, and join them with continuous arc welds. Carefully grind all welds and adjoining surfaces smooth, after welding.
- D. Provide telescoping inside expansion slip joints between sections a maximum of 20 feet on center.
- E. Shop prime all fabricated items. Spot prime all field joints and scratches prior to finish painting with two coats of finish paint.

3.13 PAINTING

- A. Scrape and wire brush existing roof top equipment, ladders, access doors and frames (both sides), the guard rail, and the vent pipes to remove loose and peeling paint and surface rust.
- B. Install one coat of primer and two finish coats of paint using a brush or roller. Wait 24 hours for each coat of paint to dry before applying the next coat.

3.14 MISCELLANEOUS

- A. Provide and install any sealants needed, where shown or required.
- B. Perform any miscellaneous mechanical and electrical work needed at existing equipment, using skilled and licensed tradesmen.
- C. Provide new material, couplings, transition pieces, blocking, fasteners and the similar accessories needed to complete the work.

3.15 CLEANING, PROTECTION AND WATERTIGHTNESS

- A. Inspect the interior and exterior of the building and grounds, and submit a written report with photos to document any pre-existing leakage or damage, prior to performing any work.
- B. The Owner will conduct a similar inspection at the completion of the work, and the Contractor will be charged for all leaks and damage that weren't documented in the Contractor's report, or repaired to the Owners satisfaction at the Contractor's expense.
- C. Provide any equipment, material and labor necessary to protect the site, the building, its contents and occupants, pedestrians, and surrounding landscaped and paved areas from damage due to the construction work or from inclement weather during construction.
- D. Do not perform work during inclement weather. Protect incomplete work and the building from damage by inclement weather which may occur unexpectedly. Make all work areas watertight at the end of each day's work.

- E. Clean up all litter, refuse, rubbish, scrap materials and debris at least twice a day; at noon and at the end of the work day, so the roof and site presents a neat, orderly and workmanlike appearance. Place the debris in a dumpster, and remove the dumpster from the site as soon as it is full or no longer being used.
- F. Carefully and thoroughly clean the entire roof to remove all residual debris when all work is complete. After cleaning the roof, thoroughly clean all drain sumps, drain lines, leader heads and leaders. Do not allow debris to enter the drainage system.
- 3.16 TESTING (This is only needed for hard wired smoke vents)
 - A. Test the new smoke hatches with the Architect or Owner present, to demonstrate they are functional, particularly with regard to security, alarm signal operation, and venting. If faults are evidenced, make the needed corrections and repeat the test until no faults occur.

END OF SECTION

SECTION 077700 - WALL CLADDING SUPPORT SYSTEM

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Exterior wall panel support system.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 054000 COLD-FORMED METAL FRAMING for exterior wall framing.
 - 2. Section 074300 FIBER-CEMENT WALL PANELS for exterior cladding.

1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design support system and framing, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Provide support system and framing capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads: As required by code.
- C. Structural: Provide system tested in accordance with ASTM E330 and certified to be without permanent deformation or failure of structural members in accordance with design wind velocities for project geographic location and probability of occurrence based on data from wind velocity maps such as provided in ASCE 7 and as approved by authorities having jurisdiction.
 - 1. Measure performance using test loads equal to 1-1/2 times the design wind loads and with 10 second duration of maximum pressure.
 - 2. Composite Framing Supports (CFS): Structurally engineered to provide in excess of 3 times structural safety factor for lengthwise, longitudinal, and crosswise loading.
- D. System Thermal Design: Installed continuous insulation system including insulation, composite framing support, sub-girts, clips and cladding attachment shall not have thermal bridging of fasteners or framing that creates a continuous metal path from the exterior surface of the insulation to the stud framing inside the wall cavity or interior face of wall. System thermal design shall meet/exceed the thermal and design requirements per the Code.

- E. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

1.4 SUBMITTALS

- A. Product Data: For each product.
- B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
- C. Delegated-Design Submittal: For framing indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Welding certificates.
- E. Qualification Data: For professional engineer.
- F. Product Test Reports: From a qualified testing agency, unless otherwise stated, indicating that each of the following complies with requirements, based on evaluation of comprehensive tests for current products:
 - Steel sheet.
 - 2. Expansion anchors.
 - 3. Power-actuated anchors.
 - 4. Mechanical fasteners.
 - 5. Vertical deflection clips.
 - 6. Miscellaneous structural clips and accessories.

1.5 QUALITY ASSURANCE

- A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.
- C. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, ductility, and metallic-coating thickness.
- D. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."

- E. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing General Provisions."
 - 1. Comply with AISI's "Standard for Cold-Formed Steel Framing Header Design."
- F. Mock-Up: Provide labor and materials for mock-ups specified in Section 014000 QUALITY REQUIREMENTS.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 COMPOSITE FRAMING SUPPORT

- A. Composite Framing Support (CFS): CFS shall consist of polyester and vinyl ester bioresin matrix with recycled materials, ultra-violet inhibitor, fire retardant additives, and integral continuous metal inserts the length of profile. CFS shall be reinforced with glass strand rovings used internally for longitudinal (lengthwise) strength and continuous strand glass mats or stitched reinforcements used internally for transverse (crosswise) strength.
 - 1. Basis of Design: Advanced Architectural Products (AAP); Simple Z-GreenGirt and other shapes as required by building configuration.
 - 2. Height: As indicated on the Drawings.
 - 3. On Center Spacing: As indicated on the Drawings.
 - 4. CFS Orientation: As indicated on the Drawings.
 - 5. Provide continuous non-corrosive steel insert for engagement of fasteners, with G90 coating designation in compliance with ASTM A 653.
 - a. Steel insert shall fully engage with adjacent CFS at ends.
 - b. Sub-girts and other exterior wall panel support accessories shall be anchored to steel insert set into and part of the CFS.
 - 6. Provide integral compression seal in CFS sections to ensure insulation panel will not dislodge and to stop air movement throughout system.
 - 7. CFS section to have integral anti-siphon grooves on exterior flanges.
 - 8. CFS section to have force distribution zones integrally designed into profile.
 - 9. CFS to have spline seals for adjacent insulation units.
 - 10. Surface Burning Characteristics:
 - a. Flame Spread: 25 or less, when tested in accordance with ASTM E 84.
 - b. Smoke Development: 450 or less, when tested in accordance with ASTM E 84.

- 11. Flammability: UL 94.
- 12. Self-Extinguishing: ASTM D 635.
- 13. Profile Visual Requirements: ASTM D 4385.
- 14. Tensile Stress: Engineered lengthwise and crosswise tensile stress is in compliance with performance loading criteria and specified safety factors, in accordance with ASTM D 638.
- 15. Compressive Stress: Engineered lengthwise and crosswise compressive stress is in compliance with performance loading criteria and specified safety factors, in accordance with ASTM D 695.
- 16. Flexural Stress: Engineered lengthwise and crosswise flexural stress is in compliance with performance loading criteria and specified safety factors, in accordance with ASTM D 790.
- 17. Modulus of Elasticity: Engineered to meet the performance loading criteria and specified safety factors.
- 18. Barcol Hardness: 45, in accordance with ASTM D 2583.
- Water Absorption: Less than 0.46 percent by weight, within 24 hours, in accordance with ASTM D 570.
- 20. Density: Within range of 0.062 to 0.070 lbs/cu in, in accordance with ASTM D 792.
- 21. Lengthwise Coefficient of Thermal Expansion: 7.0 x 10-6 inch/inch/degrees F, in accordance with ASTM D696.
- 22. Notched Izod Impact, Lengthwise: 24 ft lbs/in, in accordance with ASTM D 256 within temperature range indicated.
- 23. Notched Izod Impact, Crosswise: 4 ft lbs/in, in accordance with ASTM D 256 within temperature range indicated.

2.2 INSULATION

A. Refer to Section 072100 – THERMAL INSULATION.

2.3 SUB-GIRTS

- A. Sub-Girts: Provide metallic coated steel with G90 (Z275) coating designation, ASTM A 653/653M; structural quality.
 - 1. Basis of Design: Architectural Advanced Panels; AAP 625 or AAP 1000 Hat Girt Size: As indicated on the Drawings.
 - 2. Gage: 16 gage.
 - 3. On Center Spacing: As indicated on the Drawings.
 - 4. Orientation: As indicated on the Drawings.

2.4 ASSEMBLY

- A. Assemble continuous insulation wall panel support system using manufacturer's standard procedures and processes identical to tested units and as necessary to comply with performance requirements indicated.
- B. Comply with exterior wall panel profiles and with dimensional and structural requirements as indicated on the Drawings. Refer to Section 074200 METAL WALL PANELS.
- C. Fabricate wall panel support system with joints between exterior wall panels designed to form weathertight seals. Refer to Section 074200 METAL WALL PANELS.

- D. Form wall panel support system in a continuous process with no glues or adhesives between dissimilar materials.
- E. The CFS and Insulation panels shall create a 3 in 1 Air/Water/Vapor class 1barrier system compliant with requirements for project geographic zone.

2.5 ACCESSORIES

- A. Provide accessories necessary for a complete wall panel support system.
- B. Fasteners: Corrosion-resistant, self-tapping and self-drilling screws, bolts, nuts, and other fasteners as recommended by panel support system manufacturer for project application.
 - 1. Cladding to CFS: Use standard Tek brand screws.
 - 2. CFS to Stud Wall Framing: Use standard Tek® brand screws.
 - 3. CFS to Concrete/CMU: Use Tapcon brand anchors.
- C. Sealants: Provide sealants as recommended by exterior wall panel manufacturer for openings within wall panels and perimeter conditions.
 - 1. Refer to Section 079200 JOINT SEALANTS for requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas of this work, and project conditions with installer present for compliance with requirements for installation tolerances, substrates, wall panel support conditions, and other conditions affecting performance of this Work.
- B. Examine structural wall framing to ensure that angles, channels, studs, and other structural support members have been installed within alignment tolerances required by continuous insulation wall panel support system manufacturer.
- C. Verify that water resistive barrier has been installed over exterior sheathing to control air infiltration or water penetration as indicated for project.
- D. Examine rough-in for components and systems penetrating wall panel support system to coordinate actual locations of penetrations relative to exterior wall panel joint locations prior to installation.
- E. Verify that mechanical and electrical services for exterior walls have been installed and tested and, if appropriate, verify that adjacent materials and finishes are dry and ready to receive insulation.
- F. Proceed with installation only after exterior walls have been properly prepared and unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Prepare sub-girt, base angles, sills, furring, and other wall panel support members and provide anchorage in accordance with ASTM C 754 for gypsum panel type substrates and panel manufacturer's installation instructions.

3.3 INSTALLATION, GENERAL

- A. Install wall panel support system in accordance with manufacturer's installation instructions.
- B. Install system to fill-in exterior spaces without gaps or voids. Do not compress panel insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.
- E. Exposed insulation must be protected from open flame and kept dry at all times.
- F. Exterior wall insulation panels are not intended to be left exposed for periods of time in excess of 60 days without adequate protection.
 - 1. When extended exposure is anticipated, protect exposed insulation surfaces including corners, window and door openings with a compatible waterproof tape.
- G. Install wall panel support system in compliance with exterior wall panel orientation, sizes, and locations as indicated on Drawings.

3.4 TOLERANCES

A. Shim and align wall panel units with installed tolerances of 1/4 inch in 20 feet, non-cumulative, on level, plumb, and location lines as indicated.

3.5 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
 - 1. Refer to Division 07 THERMAL AND MOISTURE PROTECTION, exterior cladding sections for additional requirements.

3.6 PROTECTION

- A. Protect installed products from damage until date of Substantial Completion.
- B. Ensure that insulation panels are not exposed to moisture.
 - Remove wet insulation panels or allow them to completely dry prior to installation of exterior wall panel system.

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C. Replace damaged insulation panels prior to date of Substantial Completion.

END OF SECTION

SECTION 078100 - APPLIED FIREPROOFING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Standard Durability sprayed fire-resistive materials for concealed spaces not exposed to view or weather, non-high-rise construction.
 - 2. High Durability sprayed fire-resistive materials for exposed spaces, including at loading docks, at parking garages, and where exposed to weather.
 - 3. Exposed thin-film mastic and intumescent fire-resistive coatings.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 033000 CAST-IN-PLACE CONCRETE for concrete protecting structural steel.
 - 2. Section 042000 UNIT MASONRY for masonry protecting structural steel.
 - 3. Section 051200 STRUCTURAL STEEL FRAMING for surface conditions required for structural steel receiving sprayed fire-resistive materials.
 - 4. Section 078410 PENETRATION FIRESTOPPING for firestopping and firesafing insulation.
 - 5. Section 092110 GYPSUM BOARD ASSEMBLIES for fire-resistance-rated assemblies.
 - Section 092120 GYPSUM BOARD SHAFT-WALL ASSEMBLIES for fire-resistancerated assemblies.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Structural framing plans indicating the following:
 - 1. Locations and types of surface preparations required before applying sprayed fireresistive material.
 - 2. Extent of sprayed fire-resistive material for each construction and fire-resistance rating, including the following:
 - a. Applicable fire-resistance design designations of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
 - b. Minimum thicknesses needed to achieve required fire-resistance ratings of structural components and assemblies.

- 3. Treatment of sprayed fire-resistive material after application.
- C. Samples for Verification: For each type of colored, exposed sprayed fire-resistive material, two Samples, each 4 inches square, of each color, texture, and material formulation to be applied. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.
- D. Qualification Data: For Installer, manufacturer, and testing agency.
- E. Compatibility and Adhesion Test Reports: From sprayed fire-resistive material manufacturer indicating the following:
 - 1. Materials have been tested for bond with substrates.
 - 2. Materials have been verified by sprayed fire-resistive material manufacturer to be compatible with substrate primers and coatings.
 - 3. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for proposed sprayed fire-resistive materials.
 - 1. Engineering Evaluation: Provide engineering evaluation of modification of submitted fireresistance design, if required to comply with required fire-test-response characteristics, specified under Quality Assurance Article herein.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by sprayed fire-resistive material manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements. A manufacturer's willingness to sell its sprayed fire-resistive materials to Contractor or to an installer engaged by Contractor does not in itself confer qualification on the buyer.
- B. Testing Agency Qualifications: An independent approved testing agency, acceptable to authorities having jurisdiction, with the experience and capability to conduct the testing indicated, as documented in accordance with local State Building Code.
- C. Source Limitations: Obtain sprayed fire-resistive materials through one source from a single manufacturer for each type of material.
- D. Sprayed Fire-Resistive Materials Testing: By an approved testing and inspecting agency engaged by Contractor or manufacturer to test for compliance with specified requirements for performance and test methods.
 - 1. Sprayed fire-resistive materials are randomly selected for testing from bags bearing the applicable classification marking of UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 2. Testing is performed on specimens of sprayed fire-resistive materials that comply with laboratory testing requirements specified in Part 2 and are otherwise identical to installed fire-resistive materials, including application of accelerant, sealers, topcoats, tamping, troweling, rolling, and water overspray, if any of these are used in final application.

- 3. Testing is performed on specimens whose application the independent testing and inspecting agency witnessed during preparation and conditioning. Include in test reports a full description of preparation and conditioning of laboratory test specimens.
- E. Compatibility and Adhesion Testing: Engage a qualified testing and inspecting agency to test for compliance with requirements for specified performance and test methods.
 - 1. Test for bond per ASTM E 736 and requirements in UL's "Fire Resistance Directory" for coating materials. Provide bond strength indicated in referenced fire-resistance design, but not less than minimum specified in Part 2.
 - 2. Verify that manufacturer, through its own laboratory testing or field experience, has not found primers or coatings to be incompatible with sprayed fire-resistive material.
- F. Fire-Test-Response Characteristics: Provide sprayed fire-resistive materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify bags containing sprayed fire-resistive materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency acceptable to authorities having jurisdiction, for sprayed fire-resistive material serving as direct-applied protection tested per ASTM E 119.
 - a. Steel members shall be considered restrained unless specifically noted otherwise. Structural design capacity for framing members shall be assumed as "fully-loaded". Non-load restricted fire-resistance designs shall be utilized for steel beams and joists requiring more than a 1 hour rating. Fire-resistance designs that indicate a load restriction factor are not permitted for steel beams and joists requiring more than a 1 hour rating.
 - b. As required by Code, the individual beam and joist must match the assembly rating ratings.
 - 2. Surface-Burning Characteristics: ASTM E 84, limits in accordance with applicable local Building Code.
- G. Provide products containing no detectable asbestos as determined according to the method specified in 40 CFR 763, Subpart E, Appendix E, Section 1, "Polarized Light Microscopy."
- H. Code-Required Inspections: Notify Architect and Owner's independent testing agency a minimum of 72 hours prior to commencing work of this Section, for Code-required special inspections.
- I. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01. Review methods and procedures related to sprayed fire-resistive materials including, but not limited to, the following:
 - 1. Review and finalize construction schedule and verify sequencing and coordination requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to Project site in original, unopened packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, shelf life if applicable, and fire-resistance ratings applicable to Project.
- B. Use materials with limited shelf life within period indicated. Remove from Project site and discard materials whose shelf life has expired.
- C. Store materials inside, under cover, aboveground, and kept dry until ready for use. Remove from Project site and discard wet or deteriorated materials.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply sprayed fire-resistive material when ambient or substrate temperature is 40 deg F or lower unless temporary protection and heat is provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after product application.
- B. Ventilation: Ventilate building spaces during and after application of sprayed fireresistive material. Use natural means or, if they are inadequate, forced-air circulation until fire-resistive material dries thoroughly. Comply with manufacturer's recommended ventilation procedures.

1.7 COORDINATION

- A. Sequence and coordinate application of sprayed fire-resistive materials with other related work specified in other Sections to comply with the following requirements:
 - Provide temporary enclosure as required to confine spraying operations and protect the environment.
 - 2. Provide temporary enclosures for applications to prevent deterioration of fire-resistive material due to exposure to weather and to unfavorable ambient conditions for humidity, temperature, and ventilation.
 - 3. Avoid unnecessary exposure of fire-resistive material to abrasion and other damage likely to occur during construction operations subsequent to its application.
 - 4. Do not apply fire-resistive material to metal roof deck substrates until concrete topping, if any, has been completed. For metal roof decks without concrete topping, do not apply fire-resistive material to metal roof deck substrates until roofing has been completed; prohibit roof traffic during application and drying of fire-resistive material.
 - 5. Do not apply fire-resistive material to metal floor deck substrates until concrete topping has been completed.
 - 6. Except for thin-film intumescent fireproofing, do not begin applying fire-resistive material until clips, hangers, supports, sleeves, and other items penetrating fire protection are in place.
 - 7. Defer installing ducts, piping, and other items that would interfere with applying fire-resistive material until application of fire protection is completed.
 - 8. Do not install enclosing or concealing construction until after fire-resistive material has been applied, inspected, and tested and corrections have been made to defective applications.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form, signed by Contractor and by Installer, in which manufacturer agrees to repair or replace sprayed fire-resistive materials that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
 - 1. Cracking, flaking, spalling, or eroding in excess of specified requirements; peeling; or delaminating of sprayed fire-resistive materials from substrates.
 - 2. Not covered under the warranty are failures due to damage by occupants and the Owner's maintenance personnel, exposure to environmental conditions other than those investigated and approved during fire-response testing, and other causes not reasonably foreseeable under conditions of normal use.
- B. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. VOC Content: Products shall comply with VOC content limits of authorities having jurisdiction and the following VOC limits when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Flat Paints and Coatings: 50 g/L.
 - 2. Nonflat Paints and Coatings: 150 g/L.
 - 3. Primers, Sealers, and Undercoaters: 200 g/L.
 - 4. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
- B. Low-Emitting Materials: Fireproofing used within the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 STANDARD DURABILITY SPRAYED FIRE-RESISTIVE MATERIALS

- A. General: For standard density sprayed fire-resistive materials for concealed spaces not exposed to view or weather, non-high-rise construction, provide manufacturer's standard products complying with requirements indicated for material composition and physical properties representative of installed products.
 - 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. Carboline Company, subsidiary of RPM International, Fireproofing Products Div.; AD Southwest Fireproofing Type 5GP.
 - b. GCP Applied Technologies (formerly W.R. Grace); Monokote Type MK-6/HY.

- c. Isolatek International, Cafco Products; Cafco 300.
- B. Material Composition: Cementitious sprayed fire-resistive material consisting of factory-mixed, dry formulation of portland cement binders and lightweight mineral or synthetic aggregates mixed with water at Project site to form a slurry or mortar for conveyance and application, per ASTM E 1513.
- C. Physical Properties: Minimum values, unless otherwise indicated, or higher values required to attain designated fire-resistance ratings, measured per standard test methods referenced with each property as follows:
 - 1. Dry Density: 15 lb/cu. ft. for average and individual densities regardless of density indicated in referenced fire-resistance design, or greater if required to attain fire-resistance ratings indicated, per ASTM E 605 or AWCI Technical Manual 12-A, Section 5.4.5, "Displacement Method."
 - Thickness: Provide minimum average thickness required for fire-resistance design indicated according to the following criteria, but not less than 0.375 inch, per ASTM E 605:
 - a. Where the referenced fire-resistance design lists a thickness of 1 inch or greater, the minimum allowable individual thickness of sprayed fire-resistive material is the design thickness minus 0.25 inch.
 - b. Where the referenced fire-resistance design lists a thickness of less than 1 inch but more than 0.375 inch, the minimum allowable individual thickness of sprayed fire-resistive material is the greater of 0.375 inch or 75 percent of the design thickness.
 - c. No reduction in average thickness is permitted for those fire-resistance designs whose fire-resistance ratings were established at densities of less than 15 lb/cu. ft.
 - 3. Bond Strength: 150 lbf/sq. ft. minimum per ASTM E 736 under the following conditions:
 - a. Field test sprayed fire-resistive material that is applied to flanges of wideflange, structural-steel members on surfaces matching those that will exist for remainder of steel receiving fire-resistive material.
 - b. If surfaces of structural steel receiving sprayed fire-resistive material are primed or otherwise painted for coating materials, perform series of bond tests in accordance with ASTM E736 while using criteria of acceptance in UL's "Fire Resistance Directory."
 - c. Minimum thickness of sprayed fire-resistive material tested in laboratory shall be 0.75 inch.
 - 4. Compressive Strength: Minimum 1200 psf as determined in the laboratory per ASTM E 761. Minimum thickness of sprayed fire-resistive material tested shall be 0.75 inch and minimum dry density shall be as specified, but not less than 15 lb/cu. ft.
 - 5. Corrosion Resistance: No evidence of corrosion per ASTM E 937.
 - 6. Deflection: No cracking, spalling, or delamination per ASTM E 759.
 - 7. Effect of Impact on Bonding: No cracking, spalling, or delamination per ASTM E 760.
 - 8. Air Erosion: Maximum weight loss of 0.025 g/sq. ft. in 24 hours per ASTM E 859. For laboratory tests, minimum thickness of sprayed fire-resistive material is 0.75 inch

- maximum dry density is 15 lb/cu. ft. test specimens are not prepurged by mechanically induced air velocities, and tests are terminated after 24 hours.
- 9. Fungal Resistance: No observed growth on specimens per ASTM G 21.

2.3 HIGH-DURABILITY CEMENTITIOUS SPRAYED FIRE-RESISTIVE MATERIALS

- A. General: For high-density sprayed fire-resistive materials for exposed spaces, including at loading docks, at parking garages, and where exposed to weather, provide manufacturer's standard products complying with requirements indicated for material composition and for minimum physical properties of each product listed, measured by standard test methods referenced with each property.
 - 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. Carboline Company, subsidiary of RPM International, Fireproofing Products Div.; AD Southwest Fireproofing Type 7HD.
 - b. GCP Applied Technologies (formerly W.R. Grace); Monokote Type Z146.
 - c. Isolatek International Corp., Cafco Blaze Shield II.; Fendolite MII.
- B. Material Composition: Cementitious sprayed fire-resistive material consisting of factory-mixed, dry formulation of portland cement binders and lightweight mineral or synthetic aggregates mixed with water at Project site to form a slurry or mortar for conveyance and application, per ASTM E 1513.
- C. Physical Properties: Minimum values, unless otherwise indicated, or higher values required to attain designated fire-resistance ratings, measured per standard test methods referenced with each property as follows:
 - 1. Dry Density: 40 lb/cu. ft. for average and individual densities regardless of density indicated in referenced fire-resistance design, or greater if required to attain fire-resistance ratings indicated, per ASTM E 605.
 - Thickness: Provide minimum average thickness required for fire-resistance design indicated according to the following criteria, but not less than 0.375 inch, per ASTM E 605:
 - a. Where the referenced fire-resistance design lists a thickness of 1 inch or greater, the minimum allowable individual thickness of sprayed fire-resistive material is the design thickness minus 0.25 inch.
 - b. Where the referenced fire-resistance design lists a thickness of less than 1 inch but more than 0.375 inch, the minimum allowable individual thickness of sprayed fire-resistive material is the greater of 0.375 inch or 75 percent of the design thickness.
 - c. No reduction in average thickness is permitted for those fire-resistance designs whose fire-resistance ratings were established at densities of less than 40 lb/cu. ft.
 - 3. Bond Strength: 10,000 lbf/sq. ft. minimum per ASTM E 736 under the following conditions:

- Field test sprayed fire-resistive material that is applied to flanges of wideflange, structural-steel members on surfaces matching those that will exist for remainder of steel receiving fire-resistive material.
- If surfaces of structural steel receiving sprayed fire-resistive material are b. primed or otherwise painted for coating materials, perform series of bond tests in accordance with ASTM E736 while using criteria of acceptance in UL's "Fire Resistance Directory."
- Minimum thickness of sprayed fire-resistive material tested in laboratory C. shall be 0.75 inch.
- 4. Compressive Strength: Minimum 500 psi as determined in the laboratory per ASTM E 761. Minimum thickness of sprayed fire-resistive material tested shall be 0.75 inch and minimum dry density shall be as specified, but not less than 40 lb/cu. ft.
- 5. Corrosion Resistance: No evidence of corrosion per ASTM E 937.
- 6. Deflection: No cracking, spalling, or delamination per ASTM E 759.
- 7. Effect of Impact on Bonding: No cracking, spalling, or delamination per ASTM E 760.
- Air Erosion: Maximum weight loss of 0.025 g/sq. ft. in 24 hours per ASTM E 859. For laboratory tests, minimum thickness of sprayed fire-resistive material is 0.75 inch maximum dry density is 15 lb/cu. ft. test specimens are not prepurged by mechanically induced air velocities, and tests are terminated after 24 hours.
- 9. Fungal Resistance: No observed growth on specimens per ASTM G 21.

2.4 EXPOSED THIN-FILM MASTIC AND INTUMESCENT FIRE-RESISTIVE COATINGS (MIFRC)

- A. Interior General Use Conditions: Coatings limited to interior service where protection of the coating during application and curing, the construction and the occupancy of the building are as recommended by the product manufacturer for the specific application.
 - 1. Carboline; Firefilm III.
 - Carboline; Thermo-Sorb VOC. 2.
 - 3. Basis of Design: Isolatek Internaiontal Corp., Cafco Products; Cafco SprayFilm WB-5.
- B. Thin-Film Mastic and Intumescent Fire-Resistive Coating: Factory-mixed formulation.
 - 1. Approved by manufacturer and authorities having jurisdiction for interior or exterior use.
 - Multicomponent system consisting of primer, intumescent base coat and topcoat. 2.
 - Systems shall comply with applicable VOC requirements and meet OTC emission 3. regulations.
- C. Color and Gloss: As indicated by manufacturer's designations.

PATCHING EXISTING FIREPROOFING 2.5

- Patch Kit: Patch existing fireproofing disturbed by construction activities and areas Α. with missing fireproofing in the area of work. Use patching materials and methods per products listed in the UL directory. Areas more than 1 square foot in area will require spray application with patch pump.
 - 1. Installer shall examine materials on site to identify original product; typically existing materials can be identified by appearance, color or size of vermiculite.

- 2. Verify compatibility with existing fireproofing.
- 3. Materials shall comply with recommendations in "UL Requirements for Patching SFRM."

2.6 AUXILIARY FIRE-RESISTIVE MATERIALS

- A. General: Provide auxiliary fire-resistive materials that are compatible with sprayed fire-resistive materials and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.
- B. Substrate Primers: For use on each substrate and with each sprayed fire-resistive product, provide primer that complies with one or more of the following requirements:
 - 1. Primer's bond strength complies with requirements specified in UL's "Fire Resistance Directory," for coating materials based on a series of bond tests per ASTM E 736.
 - 2. Primer is identical to those used in assemblies tested for fire-test-response characteristics of sprayed fire-resistive material per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
- C. Adhesive for Bonding Fire-Resistive Material: Product approved by manufacturer of sprayed fire-resistive material.
- D. Metal Lath: Expanded metal lath fabricated from material of weight, configuration, and finish required to comply with fire-resistance designs indicated and fire-resistive material manufacturer's written recommendations. Include clips, lathing accessories, corner beads, and other anchorage devices required to attach lath to substrates and to receive sprayed fire-resistive material.
- E. Reinforcing Fabric for Use with Intumescent Coatings: Glass-fiber fabric of type, weight, and form required to comply with fire-resistance designs indicated, approved by manufacturer of thin-film mastic and intumescent coating fire-resistive material.
- F. Topcoats: Provide fireproofing manufacturer recommended topcoats for exposed fireproofing.
 - 1. Color and Gloss: Provide custom colors as selected by Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of work. A substrate is in satisfactory condition if it complies with the following:
 - 1. Substrates comply with requirements in the Section where the substrate and related materials and construction are specified.
 - 2. Substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, incompatible paints, incompatible encapsulants, or

- other foreign substances capable of impairing bond of fire-resistive materials with substrates under conditions of normal use or fire exposure.
- 3. Objects penetrating fire-resistive material, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
- 4. Substrates are not obstructed by ducts, piping, equipment, and other suspended construction that will interfere with applying fire-resistive material.
- B. Verify that concrete work on steel deck has been completed.
- C. Verify that roof construction, installation of rooftop HVAC equipment, and other related work are completed.
- D. Conduct tests according to fire-resistive material manufacturer's written recommendations to verify that substrates are free of substances capable of interfering with bond.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Cover other work subject to damage from fallout or overspray of fire-resistive materials during application.
- B. Clean substrates of substances that could impair bond of fire-resistive material, including dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, and incompatible primers, paints, and encapsulants.
- C. For exposed applications, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of sprayed fire-resistive material. Remove minor projections and fill voids that would telegraph through fire-resistive products after application.

3.3 APPLICATION, GENERAL

- A. Comply with fire-resistive material manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and spray on fire-resistive material, as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.
- B. Apply sprayed fire-resistive material that is identical to products tested as specified in Part 1 "Quality Assurance" Article and substantiated by test reports, with respect to rate of application, accelerator use, sealers, topcoats, tamping, troweling, water overspray, or other materials and procedures affecting test results.
- C. Install metal lath and reinforcing fabric, as required, to comply with fire-resistance ratings and fire-resistive material manufacturer's written recommendations for conditions of exposure and intended use. Securely attach lath and fabric to substrate in position required for support and reinforcement of fire-resistive material. Use anchorage devices of type recommended in writing by sprayed fire-resistive material

- manufacturer. Attach accessories where indicated or required for secure attachment of lath and fabric to substrate.
- D. Coat substrates with bonding adhesive before applying fire-resistive material where required to achieve fire-resistance rating or as recommended in writing by sprayed fire-resistive material manufacturer for material and application indicated.
- E. Extend fire-resistive material in full thickness over entire area of each substrate to be protected. Unless otherwise recommended in writing by sprayed fire-resistive material manufacturer, install body of fire-resistive covering in a single course.
- F. Spray apply fire-resistive materials to maximum extent possible. Following the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by sprayed fire-resistive material manufacturer.
- G. Where sealers are used, apply products that are tinted to differentiate them from sprayed fire-resistive material over which they are applied.
- 3.4 APPLICATION, CONCEALED SPRAYED FIRE-RESISTIVE MATERIALS
 - A. Apply concealed sprayed fire-resistive material in thicknesses and densities not less than those required to achieve fire-resistance ratings designated for each condition.
 - B. Cure concealed sprayed fire-resistive material according to product manufacturer's written recommendations.
- 3.5 APPLICATION, EXPOSED SPRAYED FIRE-RESISTIVE MATERIALS
 - A. Apply exposed sprayed fire-resistive material in thicknesses and densities not less than those required to achieve fire-resistance ratings designated for each condition, but apply in greater thicknesses and densities if indicated.
 - B. Provide a uniform finish complying with description indicated for each type of material and matching Architect's sample or, if none, finish approved for field-erected mockup.
 - C. Apply exposed cementitious sprayed fire-resistive materials to produce the following finish:
 - 1. Even, spray-textured finish, produced by rolling flat surfaces of fire-protected members with a damp paint roller to remove drippings and excessive roughness.
 - D. Cure exposed sprayed fire-resistive material according to product manufacturer's written recommendations.
- 3.6 APPLICATION, EXPOSED MASTIC AND INTUMESCENT FIRE-RESISTIVE COATINGS
 - A. Apply exposed thin-film mastic and intumescent fire-resistive coatings in thicknesses and densities not less than those required to achieve fire-resistance ratings designated for each condition

- B. Apply mastic and intumescent fire-resistive coating as follows:
 - Install reinforcing fabric as required to obtain designated fire-resistance rating and where indicated.
 - 2. Finish: Even, spray-textured finish produced by lightly rolling flat surfaces of fire-protected members before fire-resistive material dries, to smooth out surface irregularities and to seal in surface fibers.

3.7 APPLICATION, EXPOSED MASTIC AND INTUMESCENT FIRE-RESISTIVE COATINGS

- A. Apply exposed thin-film mastic and intumescent fire-resistive coatings in thicknesses and densities not less than those required to achieve fire-resistance ratings designated for each condition.
- B. Apply mastic and intumescent fire-resistive coating as follows:
 - 1. Install reinforcing fabric as required to obtain designated fire-resistance rating and where indicated.
 - 2. Finish: Even, spray-textured finish produced by lightly rolling flat surfaces of fire-protected members before fire-resistive material dries, to smooth out surface irregularities and to seal in surface fibers.

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections and prepare test reports, as required by 2015 IBC 1705.15.
 - 1. Cooperate with testing agency, provide access.
- B. Remove and replace applications of sprayed fire-resistive material that do not pass tests and inspections for cohesion and adhesion, for density, or for both and retest as specified above.
- C. Apply additional sprayed fire-resistive material, per manufacturer's written instructions, where test results indicate that thickness does not comply with specified requirements, and retest as specified above.
- D. Field inspect intumescent materials in accordance with AWCI Tech Manual 12B.

3.9 CLEANING, PROTECTING, AND REPAIR

- A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.
- B. Protect sprayed fire-resistive material, according to advice of product manufacturer and Installer, from damage resulting from construction operations or other causes so fire protection will be without damage or deterioration at time of Substantial Completion.

- C. Coordinate application of sprayed fire-resistive material with other construction to minimize need to cut or remove fire protection. As installation of other construction proceeds, inspect sprayed fire-resistive material and patch any damaged or removed areas.
- D. Repair or replace work that has not successfully protected steel.

END OF SECTION

SECTION 078410 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Through-penetration firestop systems for penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items.
- B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
 - 1. Section 078440 FIRE-RESISTIVE JOINT SYSTEMS for fire-resistive joint sealers.
 - 2. Section 079200 JOINT SEALANTS for standard joint sealers.
 - 3. Section 142400 HYDRAULIC ELEVATORS for cutting penetrations for elevator piping, cabling and conduit penetrations and providing firestopping complying with requirements in this Section.
 - 4. Division 21 FIRE SUPPRESSION for cutting penetrations for fire-suppression piping and providing firestopping complying with requirements in this Section.
 - 5. Division 22 PLUMBING for cutting penetrations for plumbing piping and providing firestopping complying with requirements in this Section.
 - 6. Division 23 HEATING, VENTILATING AND AIR CONDITIONING for cutting penetrations for ductwork and HVAC piping and providing firestopping complying with requirements in this Section.
 - 7. Division 25 INTEGRATED AUTOMATION for cutting penetrations for cable and conduit and providing firestopping complying with requirements in this Section.
 - 8. Division 26 ELECTRICAL for cutting penetrations for cable and conduit and providing firestopping complying with requirements in this Section.
 - 9. Division 27 COMMUNICATIONS for cutting penetrations for cable and conduit and providing firestopping complying with requirements in this Section.
 - 10. Division 28 ELECTRONIC SAFETY AND SECURITY for cutting penetrations for cable and conduit and providing firestopping complying with requirements in this Section.

1.3 COORDINATION

A. Jobsite conditions of each through-penetration firestop system must meet all details of the UL-Classified System selected. If jobsite conditions do not match any UL-classified systems, contact firestop manufacturer for alternative systems or Engineer Judgment Drawings.

- B. Coordinate work with other trades to assure that penetration-opening sizes are appropriate for penetrant locations.
- C. Verify that the schedule is current at the time of construction, and that each referenced system is suitable for the intended application.

1.4 PERFORMANCE REQUIREMENTS

- A. General: For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide throughpenetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.
- B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
 - 1. Fire-resistance-rated walls include fire walls, fire-barrier walls, smoke-barrier walls and fire partitions.
 - 2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
 - 1. Horizontal assemblies include floors, floor/ceiling assemblies and ceiling membranes of roof/ceiling assemblies.
 - 2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
 - 3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
- D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.
 - 1. L-Rating: Not exceeding 5.0 cfm/sq. ft. (0.025 cu. m/s per sq. m) of penetration opening at 0.30-inch wg (74.7 Pa) at both ambient and elevated temperatures.

E. Exposed Penetration Firestopping:

- 1. Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- 2. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.
 - a. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems demonstrating no evidence of water leakage when tested according to UL 1479.

- b. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved, either by installing floor plates or by other means.
- F. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each through-penetration firestop system, show each type of construction condition penetrated, relationships to adjoining construction, and type of penetrating item. Include firestop design designation of qualified testing and inspecting agency that evidences compliance with requirements for each condition indicated.
 - 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.
- C. Through-Penetration Firestop System Schedule: Indicate locations of each throughpenetration firestop system, along with the following information:
 - 1. Types of penetrating items.
 - 2. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.
 - 3. Through-penetration firestop systems for each location identified by firestop design designation of qualified testing and inspecting agency.
- D. Qualification Data: For Installer.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Either a firm that has been approved by FMG according to FMG 4991, "Approval of Firestop Contractors" or a firm experienced in installing through-penetration firestop systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction of a minimum of five projects with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements.
- B. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single qualified installer.
- C. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, through one source from a single manufacturer.

- D. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:
 - 1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
 - 2. Through-penetration firestop systems are identical to those tested per testing standard referenced in "Part 1 Performance Requirements" Article. Provide rated systems complying with the following requirements:
 - a. Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.
 - b. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed in the UL "Fire Resistance Directory."
- E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.9 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that throughpenetration firestop systems are installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.

C. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined building inspector, if required by authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, through-penetration firestop systems that may be incorporated into the Work include, but are not limited to the following:
 - 1. Basis of Design: Hilti, Inc.
 - 2. BioFireshield; RectorSeal Corporation.
 - 3. Specified Technologies, Inc. (STI).
 - 4. 3M; Fire Protection Products Division.

2.2 FIRESTOPPING MATERIALS

- A. Low-Emitting Materials: Penetration firestopping sealants and sealant primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. VOC Content: Penetration firestopping sealants and sealant primers shall comply with the following limits for VOC content:
 - 1. Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
 - 4. Methylene chloride and perchloroethylene may not be intentionally added to sealants.
- C. Compatibility: Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.
- D. Materials: Provide through-penetration firestop systems containing primary materials and fill materials which are part of the tested assemblies indicated in the approved Through-Penetration Firestop System Schedule submittal. Fill materials are those referred to in directories of referenced testing and inspecting agencies as "fill," "void," or "cavity" materials.
 - 1. Available Products:
 - a. BioFireshield: RectorSeal Smoke and Acoustic Sealant.
 - b. Hilti; CP 606 Flexible Firestop Sealant.
 - c. Hilti; CP 653 BA Firestop Speed Sleeve.

- d. Hilti; FS-ONE Intumescent Firestop Sealant.
- E. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by qualified testing and inspecting agency for firestop systems indicated.
- F. Endothermic Mats: 3M Interam Endothermic Mats by 3M Fire Protection Products; located in rated walls behind cabinet unit heaters, fire extinguisher cabinets and electrical panels where there are space limitations to maintain the wall rating.

2.3 MIXING

A. For those products requiring mixing before application, comply with throughpenetration firestop system manufacturer's written instructions for accurate
proportioning of materials, water (if required), type of mixing equipment, selection of
mixer speeds, mixing containers, mixing time, and other items or procedures needed to
produce products of uniform quality with optimum performance characteristics for
application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of work. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Clean out openings immediately before installing throughpenetration firestop systems to comply with firestop system manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.3 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

- A. General: Install through-penetration firestop systems to comply with Part 1
 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming/damming/backing 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 indicated.
- C. Install fill materials for firestop systems by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
 - 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 Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 FIELD QUALITY CONTROL

- A. Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections and prepare test reports, as required by 2015 IBC 1705.17 and 1705.17.1. Independent inspecting agency shall comply with ASTM E 2174 requirements including those related to qualifications, conducting inspections, and preparing test reports
- B. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.
- C. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued and firestop installations comply with requirements.

3.5 CLEANING AND PROTECTING

- A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems

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immediately and install new materials to produce systems complying with specified requirements.

END OF SECTION

SECTION 078440 - FIRE-RESISTIVE JOINT SYSTEMS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to fire-resistive joint systems for the following:
 - 1. Floor-to-floor joints.
 - 2. Floor-to-wall joints.
 - 3. Head-of-wall joints.
 - 4. Wall-to-wall joints.
 - 5. Perimeter fire-resistive joint systems consisting of floor-to-wall joints between perimeter edge of fire-resistance-rated floor assemblies and exterior curtain walls.
- B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
 - 1. Section 078410 PENETRATION FIRESTOPPING for firestopping.
 - 2. Division 21 FIRE SUPPRESSION for fire-protection piping penetrations.
 - 3. Division 22 PLUMBING for piping penetrations.
 - 4. Division 23 HEATING, VENTILATING AND AIR CONDITIONING for duct and piping penetrations.
 - 5. Division 26 ELECTRICAL for cable and conduit penetrations.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assembly in which fire-resistive joint systems are installed.
- B. For fire-resistive systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

- B. Shop Drawings: For each fire-resistive joint system, show each kind of construction condition in which joints are installed; also show relationships to adjoining construction. Include fire-resistive joint system design designation of testing and inspecting agency acceptable to authorities having jurisdiction that demonstrates compliance with requirements for each condition indicated.
 - 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each fire-resistive joint system configuration for construction and penetrating items.
- C. Fire-Resistive Joint Systems Schedule: For each fire-resistive joint system. Include location and design designation of qualified testing agency.
 - 1. Where Project conditions require modification to a qualified testing agency's illustration for a particular fire-resistive joint system condition, submit illustration, with modifications marked, approved by fire-resistive joint system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.
- D. Product Certificates: For each type of fire-resistive joint system, signed by product manufacturer.
- E. Qualification Data: For Installer.
- F. Field quality-control test reports.
- G. Research/Evaluation Reports: For each type of fire-resistive joint system.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm experienced in installing through-penetration fire stop systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction of a minimum of five projects with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Evidence of FMG 4991 approval is acceptable for installer qualifications, but not mandatory.
- B. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single qualified installer.
- C. Source Limitations: Obtain fire-resistive joint systems, for each kind of joint and construction condition indicated, through one source from a single manufacturer.
- D. Fire-Test-Response Characteristics: Provide fire-resistive joint systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:
 - 1. Fire-resistance tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL or another agency performing testing and follow-up inspection services for fire-resistive joint systems acceptable to authorities having jurisdiction.

- 2. Fire-resistive joint systems are identical to those tested per methods indicated in Part 1 "Performance Requirements" Article and comply with the following:
 - a. Fire-resistive joint system products bear classification marking of qualified testing and inspecting agency.
 - b. Fire-resistive joint systems correspond to those indicated by referencing system designations of the qualified testing and inspecting agency.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver fire-resistive joint system products to Project site in original, unopened containers or packages with qualified testing and inspecting agency's classification marking applicable to Project and with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials for fire-resistive joint systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install fire-resistive joint systems when ambient or substrate temperatures are outside limits permitted by fire-resistive joint system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Ventilate fire-resistive joint systems per manufacturer's written instructions by natural means or, if this is inadequate, forced-air circulation.

1.8 COORDINATION

- A. Coordinate construction of joints to ensure that fire-resistive joint systems are installed according to specified requirements.
- B. Coordinate sizing of joints to accommodate fire-resistive joint systems.
- C. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined building inspector, if required by authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, fire-resistive joint systems that may be incorporated into the Work include, but are not limited to the following:
 - 1. Hilti, Inc.

- 2. BioFireshield; RectorSeal Corporation.
- 3. Specified Technologies, Inc. (STI).
- 4. 3M; Fire Protection Products Division.

2.2 FIRE-RESISTIVE JOINT SYSTEMS

- A. Low-Emitting Materials: Fire-resistive joint system sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. VOC Content: Provide fire-resistive joint system sealants that comply with the following limits for VOC content:
 - 1. Architectural Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
 - 4. Methylene chloride and perchloroethylene may not be intentionally added to sealants.
- C. General: Where required, provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which fire-resistive joint systems are installed. Fire-resistive joint systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
- D. Joints in or between Fire-Resistance-Rated Construction: Provide fire-resistive joint systems with ratings determined per ASTM E 1966 or UL 2079.
- E. Joints at Exterior Curtain-Wall/Floor Intersections: Provide fire-resistive joint systems with rating determined by ASTM E 119 based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa) or ASTM E 2307.
 - 1. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the floor assembly.
- F. Joints in Smoke Barriers: Provide fire-resistive joint systems with ratings determined per UL 2079.
 - 1. L-Rating: Not exceeding 5.0 cfm/ft (0.00775 cu. m/s x m) of joint at 0.30 inch wg (74.7 Pa) at both ambient and elevated temperatures.
- G. Compatibility: Provide fire-resistive joint systems that are compatible with joint substrates, under conditions of service and application, as demonstrated by fire-resistive joint system manufacturer based on testing and field experience.
- Accessories: Provide components of fire-resistive joint systems, including primers and forming materials, that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by fire-resistive

joint system manufacturer and approved by the qualified testing and inspecting agency for systems indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of work.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Clean joints immediately before installing fire-resistive joint systems to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
 - 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of fill materials.
 - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with fill materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by fire-resistive joint system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent fill materials of fire-resistive joint system from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from fire-resistive joint system materials. Remove tape as soon as possible without disturbing fire-resistive joint system's seal with substrates or damaging adjoining surfaces.

3.3 INSTALLATION

- A. General: Install fire-resistive joint systems to comply with Part 1 "Performance Requirements" Article and fire-resistive joint system manufacturer's written installation instructions for products and applications indicated.
- B. Install forming/packing/backing materials and other accessories of types required to support fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
- C. Install fill materials for fire-resistive joint systems by proven techniques to produce the following results:

- 1. Fill voids and cavities formed by openings and forming/packing/backing materials as required to achieve fire-resistance ratings indicated.
- 2. Apply fill materials so they contact and adhere to substrates formed by joints.
- 3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 FIELD QUALITY CONTROL

- A. Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections and prepare test reports, as required by 2015 IBC 1705.17 and 1705.17.2. Independent inspecting agency shall comply with ASTM E 2393 requirements including those related to qualifications, conducting inspections, and preparing test reports.
- B. Testing Services: Inspecting of completed installations of fire-resistive joint systems shall take place in successive stages as installation of fire-resistive joint systems proceeds. Do not proceed with installation of joint systems for the next area until inspecting agency determines completed work shows compliance with requirements.
 - 1. Inspecting agency shall state in each report whether inspected fire-resistive joint systems comply with or deviate from requirements.
- C. Remove and replace fire-resistive joint systems where inspections indicate that they do not comply with specified requirements.
- D. Additional inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- E. Proceed with enclosing fire-resistive joint systems with other construction only after inspection reports are issued and fire-resistive joint systems comply with requirements.

3.5 CLEANING AND PROTECTING

- A. Clean off excess fill materials adjacent to joints as Work progresses by methods and with cleaning materials that are approved in writing by fire-resistive joint system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure fire-resistive joint systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated fire-resistive joint systems immediately and install new materials to produce fire-resistive joint systems complying with specified requirements.

END OF SECTION

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Joint sealants and fillers.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - Section 042000 UNIT MASONRY for masonry control and expansion joint fillers and gaskets.
 - 2. Section 088000 GLAZING for glazing sealants.
 - 3. Section 092110 GYPSUM BOARD ASSEMBLIES for sealing perimeter joints of gypsum board partitions to reduce sound transmission.
 - 4. Section 093000 TILING for sealing of expansion, contraction, control, and isolation ioints in tile surfaces.
 - 5. Section 095100 ACOUSTICAL CEILINGS for sealing edge moldings at perimeters of acoustical ceilings.

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 product indicated.
- B. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- C. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.

- 3. Joint-sealant formulation.
- 4. Joint-sealant color.
- D. Qualification Data: For Installer and qualified testing agency.
- E. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.
- F. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in "Quality Assurance" Article.
- G. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- H. Field Test Report Log: For each elastomeric sealant application.

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. Product Testing: Test joint sealants using a qualified testing agency.
 - 1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.
- C. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- D. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - a. Adhesion Testing: Use ASTM C 794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - b. Compatibility Testing: Use ASTM C 1087 to determine sealant compatibility when in contact with joint sealant backing and glazing and gasket materials.
 - 2. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 3. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
 - 4. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

- E. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates as follows:
 - 1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 - 2. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated.
 - b. Each type of nonelastomeric sealant and joint substrate indicated.
 - Notify Architect seven days in advance of dates and times when test joints will be erected.
 - a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193.
 - For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 - 4. Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
 - 5. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.
- F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

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.
 - 2. When joint substrates are wet.
 - Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

- A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.

- B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- C. Special warranties specified in this Article exclude deterioration or failure of joint sealants from the following:
 - 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 - 2. Disintegration of joint substrates from natural causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 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. Low-Emitting Materials: Interior sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. VOC Content: Provide interior sealants and sealant primers that comply with the following limits for VOC content:
 - 1. Architectural Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
 - 4. Methylene chloride and perchloroethylene may not be intentionally added to sealants.
- D. Colors of Exposed Joint Sealants: Provide colors as selected by the Architect from manufacturer's full range of standard and custom colors; maximum of five colors, three standard colors and two custom colors.

2.2 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.
- B. Stain-Test-Response Characteristics: Elastomeric sealants shall 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 or ANSI/NSF Standard 51.
- D. Exterior Silicone Sealant, Single-Component Neutral-Curing Type:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dow Corning Corporation; 790.
 - b. GE Silicones; SilPruf LM SCS2700.
 - c. Pecora Corporation; 864.
 - d. Tremco Inc.; Spectrem 1.
 - 2. Extent of Use: Exterior joints in vertical and soffit surfaces.
- E. Exterior Urethane Sealant, Multicomponent Pourable (Self-Leveling) Type for Pedestrian Traffic: ASTM C 920, Type M, Grade P, Class 25, Use T, M, & O.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Meadows, W. R., Inc.; POURTHANE.
 - b. Pecora Corporation; Urexpan NR-200.
 - c. Sika; Sikaflex-2c SL.
 - d. Tremco Inc.; THC-901.
 - 2. Extent of Use: Exterior joints in horizontal surfaces.
- F. Interior Sanitary Silicone Sealant, Single-Component Mildew-Resistant, Acid-Curing (Acetoxy) Type: ASTM C 920, Type S, Grade NS, Class 25, Use NT, G, A, and O.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Bostik; Pure Silicone.
 - b. Dow Corning Corporation; 786 Mildew Resistant.
 - c. GE Silicones; Sanitary SCS1700.
 - d. Pecora; 898NST.
 - e. Sika; Sikasil GP.
 - f. Tremco; Tremsil 200.
 - 2. Extent of Use: Interior sanitary joints at toilet rooms, kitchens, and other wet areas.
- G. Interior Acrylic Latex Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Henkel Corp.; Loctite Polyseamseal Acrylic Caulk with Silicone.
 - b. Pecora Corporation; AC-20+.
 - c. Tremco Inc.; Tremflex 834.

2. Extent of Use: Interior non-moving joints.

2.3 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type B (bicellular material with a surface skin) or other type, 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.
 - 1. Availavle Products: Armacell Canada Inc.; ITP Standard Backer Rod; or approved equal.
- 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.

2.4 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 concrete, masonry, unglazed surfaces of ceramic tile, and exterior insulation and finish systems.
- 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 the following metal, glass, porcelain enamel, and glazed surfaces of ceramic tile.
- B. 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.
- C. 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. 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.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. 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.

- F. 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.

3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
 - 1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.
 - 2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 - 3. Inspect tested joints and report on the following:
 - a. Whether sealants filled joint cavities and are free of voids.
 - Whether sealant dimensions and configurations comply with specified requirements.
 - c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
 - 4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
 - 5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 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.

3.6 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

SECTION 079500 - EXPANSION CONTROL

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Architectural expansion joint systems for interior and exterior joints as scheduled on the Drawings and specified in this Section.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 033000 CAST-IN-PLACE CONCRETE for block-outs for architectural joint systems in concrete floors, decks, and walls.
 - 2. Section 042000 UNIT MASONRY for masonry wall expansion joint cover.
 - 3. Section 075210 SBS MODIFIED BITUMINOUS MEMBRANE ROOFING for installing sheet metal flashing and trim integral with roofing membrane.
 - 4. Section 078446 FIRE-RESISTIVE JOINT SYSTEMS for fire-resistive joints not associated with expansion control assemblies.
 - 5. Section 079200 JOINT SEALANTS for elastomeric sealants and preformed compressed-foam sealants without metal frames.
 - 6. Section 092110 GYPSUM BOARD ASSEMBLIES for framing joint in gypsum board assemblies.

1.3 DEFINITIONS

- A. Architectural Joint System: Any filler or cover used to span, fill, cover, or seal a joint, except expanding foam seals and poured or foamed in-place sealants.
- B. Cyclic Movement: Periodic change between widest and narrowest joint widths in an automatically mechanically controlled system.
- C. Fire Barriers: Any material or material combination, when fire tested after cycling, designated to resist passage of flame and hot gases through a movement joint.
- D. Maximum Joint Width: Widest linear gap a joint system tolerates and performs its designed function without damaging its functional capabilities.
- E. Minimum Joint Width: Narrowest linear gap a joint system tolerates and performs its designed function without damaging its functional capabilities.

- F. Movement Capability: Value obtained from the difference between widest and narrowest widths of a joint opening typically expressed in numerical values (mm or inches) or a percentage of nominal value of joint width.
- G. Nominal Joint Width: Width of linear gap indicated as representing the conditions existing when architectural joint systems will be installed or, if no nominal joint width is indicated, a width equal to the sum of maximum and minimum joint widths divided by two.

1.4 PERFORMANCE REQUIREMENTS

- Α. General: Provide factory-fabricated architectural joint systems capable of withstanding the types of loads and of accommodating the kinds of movement, and the other functions for which they are designed including those specified below, without failure. Types of failure include those listed in Appendix X3 of ASTM E 1399.
 - 1. Vehicular Traffic Joints: Support vehicular traffic across joint, including construction equipment and full-loaded fire apparatus.
 - 2. Pedestrian Traffic Joints: Support pedestrian traffic across joint.
 - Exterior Joints: Maintain continuity of weather enclosure. 3.
 - Joints in Fire-Resistance-Rated Assemblies: Maintain fire-resistance ratings of 4. assemblies.
 - 5. Joints in Smoke Barriers: Maintain integrity of smoke barrier.
 - Joints in Acoustically Rated Assemblies: Inhibit passage of airborne noise. 6.
 - Other Joints: Where indicated, provide joint systems that prevent penetration of water, 7. moisture, and other substances deleterious to building components or content.
 - 8. Seismic Performance: Expansion control systems shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - The term "withstand" means "the system will remain in place without a. separation of any parts when subjected to the seismic forces specified and the system will be fully operational after the seismic event."
 - Component Importance Factor is 1.5. b.
 - 9. Joints in Surfaces with Architectural Finishes: Serve as finished architectural joint closures.

1.5 **SUBMITTALS**

- Product Data: Include manufacturer's product specifications, construction details, Α. material and finish descriptions, and dimensions of individual components and seals.
- B. Shop Drawings: For each joint system specified, provide the following:
 - Placement Drawings: Include line diagrams showing entire route of each joint system, 1. plans, elevations, sections, details, joints, splices, locations of joints and splices, and attachments to other Work. Where joint systems change planes, provide Isometric Drawings depicting how components interconnect to achieve continuity of joint covers and fillers.

- C. Samples for Verification: Full-size units 6 inches long of each type of joint system indicated; in sets for each finish, color, texture, and pattern specified, showing the full range of variations expected in these characteristics.
- D. Product Test Reports: From a qualified testing agency indicating architectural joint systems comply with requirements, based on comprehensive testing of current products.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain architectural joint systems through one source from a single manufacturer. Coordinate compatibility with adjoining joint systems specified in other Sections.
- B. Fire-Test-Response Characteristics: Where indicated, provide joint systems incorporating fire barriers that are identical to those of assemblies tested for fire resistance per UL 2079 or ASTM E 1966, including hose-stream test of vertical wall assemblies and wall-to-ceiling assemblies, by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Hose Stream Test: Wall-to-wall and wall-to-ceiling systems shall be subjected to hose stream testing.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Balco, Inc.
 - 2. Construction Specialties, Inc.
 - 3. JointMaster/InPro Corporation.
 - 4. Michael Rizza Company, LLC.
 - 5. MM Systems Corporation.
 - 6. Nystrom, Inc.
 - 7. Sika / Emseal.
 - 8. Watson Bowman Acme Corp.; a BASF Construction Chemicals business.

2.2 MATERIALS

- A. Aluminum: ASTM B 221, alloy 6063-T5 for extrusions; ASTM B 209, alloy 6061-T6 for sheet and plate.
 - 1. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious materials.
- B. Stainless Steel: ASTM A 666, Type 304 with No. 2B finish, unless otherwise indicated, for plates, sheet, and strips.

- C. Preformed Seals: Single or multicellular extruded elastomeric seals designed with or without continuous, longitudinal, internal baffles. Formed to be installed in frames or with anchored flanges, in color indicated or, if not indicated, as selected by Architect from manufacturer's standard colors.
- D. Strip Seals: Elastomeric membrane or tubular extrusions with a continuous longitudinal internal baffle system throughout complying with ASTM E 1783; used with compatible frames, flanges, and molded-rubber anchor blocks.
- E. Compression Seals: Preformed, elastomeric extrusions having internal baffle system complying with ASTM E 1612 in sizes and profiles indicated or as recommended by manufacturer.
- F. Preformed Cellular Foams: Nonextruded, low-density, crosslinked, nitrogen-blown ethylene-vinyl-acetate copolymer extruded, compressible foam.
- G. Fire Barriers: Any material or material combination, when fire tested after cycling, designated to resist the passage of flame and hot gases through a movement joint.
- H. Accessories: Manufacturer's standard anchors, clips, fasteners, set screws, spacers, flexible moisture barrier and filler materials, drain tubes, lubricants, adhesives, and other accessories compatible with material in contact, as indicated or required for complete installations.

2.3 ARCHITECTURAL JOINT SYSTEMS

- A. General: Provide joint systems of design, basic profile, materials, and operation indicated. Provide units with the capability to accommodate joint widths indicated and variations in adjacent surfaces.
 - 1. Furnish units in longest practicable lengths to minimize number of end joints. Provide hairline mitered corners where joint changes directions or abuts other materials.
 - 2. Include closure materials and transition pieces, tee-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous joint systems.
 - 3. Frames for Strip Seals: Designed with semiclosed cavity that provides a mechanical lock for seals of type indicated.
 - 4. Public Area Seals: Non-slip seals designed for installation on treads and risers and to lie flat with adjacent surfaces, and complying with ADA guidelines for public areas.

2.4 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.5 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

2.6 STAINLESS-STEEL FINISHES

- A. Remove tool and die marks and stretch lines or blend into finish.
- B. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
- C. Bright, Directional Polish: No. 4 finish.
- D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare substrates according to architectural joint system manufacturer's written instructions.
- B. Coordinate and furnish anchorages, Placement Drawings, and instructions for installing joint systems to be embedded in or anchored to concrete or to have recesses formed into edges of concrete slab for later placement and grouting-in of frames.
- C. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary to secure joint systems to in-place construction, including threaded fasteners with drilled-in expansion shields for masonry and concrete where anchoring members are not embedded in concrete. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of joint systems.
- D. Provide the services of a surveyor licensed in the state the project is located prior to and after paving substrate to confirm alignment of joint.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for handling and installing architectural joint assemblies and materials, unless more stringent requirements are indicated.

- B. Coordinate installation of architectural joint assembly materials and associated work so complete assemblies comply with assembly performance requirements.
- C. Terminate exposed ends of exterior architectural joint assemblies with factory-fabricated termination devices to maintain waterproof system.
- D. Install factory-fabricated transitions between building expansion-joint cover assemblies and roof expansion-joint assemblies to provide continuous, uninterrupted, watertight construction.
- E. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required to install joint systems.
 - 1. Install joint cover assemblies in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
 - 2. Allow adequate free movement for thermal expansion and contraction of metal to avoid buckling.
 - 3. Set covers in horizontal surfaces at elevations that place exposed surfaces flush with adjoining finishes.
 - 4. Locate covers in continuous contact with adjacent surfaces.
 - 5. Securely attach in place with required accessories.
 - 6. Locate anchors at interval recommended by manufacturer, but not less than 3 inches from each end and not more than 24 inches o.c.
- F. Continuity: Maintain continuity of joint systems with a minimum number of end joints and align metal members. Cut and fit ends to produce joints that will accommodate thermal expansion and contraction of metal to avoid buckling of frames. Adhere flexible filler materials, if any, to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.
- G. Extruded Preformed Seals: Install seals to comply with manufacturer's written instructions and with minimum number of end joints.
 - 1. For straight sections, provide preformed seals in continuous lengths.
 - 2. Vulcanize or heat-weld field splice joints in preformed seal material to provide watertight joints using procedures recommended by manufacturer.
 - 3. Apply adhesive, epoxy, or lubricant adhesive approved by manufacturer to both frame interfaces before installing preformed seals.
 - 4. Seal transitions according to manufacturer's written instructions.
 - 5. Install foam seals with adhesive recommended by manufacturer and heat seal all splices.
- H. Joint Systems with Seals: Seal end joints within continuous runs and joints at transitions according to manufacturer's written instructions to provide a watertight installation.
- I. Seismic Seals: Install interior seals in continuous lengths. Install exterior seal in standard lengths and vulcanize or heat-weld field splice joints to provide watertight joints using manufacturer's recommended procedures. Seal transitions and end joints according to manufacturer's written instructions.

J. Fire Barriers: Install fire barriers to provide continuous, uninterrupted fire resistance throughout length of joint, including transitions and end joints.

3.3 CLEANING AND PROTECTION

A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.

END OF SECTION

SECTION 081110 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - Standard hollow-metal steel doors and frames.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 042000 UNIT MASONRY for building anchors into masonry construction.
 - 2. Section 087100 DOOR HARDWARE for door hardware for steel doors.
 - 3. Section 088000 GLAZING for glazed lites.
 - 4. Section 092110 GYPSUM BOARD ASSEMBLIES for insulation.
 - 5. Section 099000 PAINTING AND COATING for field painting steel doors and frames.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, core descriptions, label compliance, fire-resistance rating, temperature-rise ratings, and finishes for each type of steel door and frame specified.
- B. Shop Drawings:
 - 1. Elevations of each door design.
 - 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
 - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 4. Locations of reinforcement and preparations for hardware.
 - 5. Details of each different wall opening condition.
 - 6. Details of anchorages, joints, field splices, and connections.
 - 7. Details of accessories.
 - 8. Details of moldings, removable stops, and glazing.
 - 9. Details of conduit and preparations for power, signal, and control systems.
- C. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.
- D. Qualification Data: For Installer.

E. Product Test Reports: Based on evaluation of comprehensive fire tests performed by a qualified testing agency, for each type of standard steel door and frame.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Source Limitations: Obtain standard steel doors and frames through one source from a single manufacturer.
- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fireprotection ratings and temperature-rise limits indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
 - 1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.
 - 2. Temperature-Rise Limit: Fire door assemblies in interior exit stairways and ramps and exit passageways shall have a maximum transmitted temperature rise of not more than 450 degrees F (250 degrees C) above ambient at the end of 30 minutes of standard fire test exposure. Exception: The maximum transmitted temperature rise is not required in buildings equipped throughout with an automatic sprinkler system installed in accordance with IBC Section 903.3.1.1 or 903.3.1.2.
- D. Fire-Rated, Borrowed-Light Assemblies (Including Sidelights and Transoms): Complying with NFPA 80 and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.
- E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch-high wood blocking. Do not store in a manner that traps excess humidity.
 - 1. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Ceco Door Products; an ASSA ABLOY Group Company.
 - 2. CURRIES Company; an ASSA ABLOY Group Company.
 - 3. de LaFontaine
 - 4. Philipp Manufacturing Company.
 - 5. Steelcraft; an Allegion (formerly Ingersoll-Rand) company.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated, (Galvanized/Galvannealed) Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60/A60 metallic coating.
- D. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z coating designation; mill phosphatized.
 - For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow metal frames of type indicated.
- G. Insulation: Comply with requirements in Section 092110 GYPSUM BOARD ASSEMBLIES.
- H. Glazing: Comply with requirements in Section 088000 GLAZING.
- I. Environmental Product Declarations (EPD): Product-specific Type III EPDs for hollow metal doors and frames are available from manufacturers listed herein.

J. Low-Emitting Materials: Provide building products in compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.3 STANDARD STEEL DOORS

- A. General: Provide doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces, unless otherwise indicated. Comply with ANSI A250.8.
 - 1. Design: Flush panel.
 - 2. Core Construction: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, mineral-board, or vertical steel-stiffener core that produces doors complying with ANSI A250.8.
 - a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
 - b. Thermal-Rated (Insulated) Exterior Doors: Where indicated, provide doors fabricated with thermal-resistance value (R-value) of not less than 2.5 when tested according to ASTM C 1363.
 - 3. Top and Bottom Edges: Closed with flush or inverted 0.042-inch-thick end closures or channels of same material as face sheets.
 - 4. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
- B. Interior Doors: Face sheets fabricated from cold-rolled steel sheet. Provide doors complying with requirements indicated below by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level:
 - 1. Level 2 and Physical Performance Level B (Heavy Duty), Model 2 (Seamless), 1-3/4 inches thick.
- C. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- D. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

2.4 STANDARD STEEL FRAMES

- A. General: Comply with ANSI A250.8 and with details indicated for type and profile.
- B. Interior Frames: Fabricated from cold-rolled steel sheet.
 - 1. Fabricate frames with full profile welded joints.
 - 2. Frames for Level 2 Steel Doors: 0.053-inch-thick steel sheet.
- C. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

A. Jamb Anchors:

- 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
- 2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
- 3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
- 4. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
- B. Floor Anchors: Formed from same material as frames, not less than 0.042 inch (1.0 mm) thick, and as follows:
 - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 - 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.

2.6 HOLLOW METAL PANELS

A. Provide hollow metal panels of same materials, construction, and finish as specified for adjoining hollow metal work.

2.7 STOPS AND MOLDINGS

- A. Moldings for Glazed Lites in Doors: Minimum 0.032 inch thick, fabricated from same material as door face sheet in which they are installed.
- B. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch high unless otherwise indicated.
- C. Loose Stops for Glazed Lites in Frames: Minimum 0.032 inch thick, fabricated from same material as frames in which they are installed.

2.8 LOUVERS

- A. Provide louvers for interior doors, where indicated, that comply with SDI 111C, with blades or baffles formed of 0.020-inch-thick, cold-rolled steel sheet set into 0.032-inch-thick steel frame.
 - 1. Sightproof Louver: Stationary louvers constructed with inverted V-shaped or Y-shaped blades.
 - 2. Fire-Rated Automatic Louvers: Louvers constructed with movable blades closed by actuating fusible link, and listed and labeled for use in fire-rated door assemblies of type and fire-resistance rating indicated by same testing and inspecting agency that established fire-resistance rating of door assembly.

2.9 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Ceiling Struts: Minimum 1/4-inch-thick by 1-inch-wide steel.

2.10 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.
- C. Hollow Metal Doors:
 - Glazed Lites: Factory cut openings in doors.
 - 2. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
- D. Hollow Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Full Profile Welded Frames: Weld joints continuously; grind, fill, dress, and make smooth, flush, and not visible.
 - 2. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as doorframe. Fasten members at crossings and to jambs by butt welding.
 - 3. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 4. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
 - 5. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Two anchors per jamb up to 60 inches high.
 - 2) Three anchors per jamb from 60 to 90 inches high.
 - 3) Four anchors per jamb from 90 to 120 inches high.
 - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
 - b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.
 - 3) Five anchors per jamb from 90 to 96 inches high.

- 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
- 5) Two anchors per head for frames above 42 inches wide and mounted in metal-stud partitions.
- c. Compression Type: Not less than two anchors in each jamb.
- d. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.
- 6. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- E. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.
- F. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Section 087100 DOOR HARDWARE.
 - Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 - 2. Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.
 - 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
 - 4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 ELECTRICAL.
- G. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
 - Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow metal work.
 - 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings, so that each glazed lite is capable of being removed independently.
 - 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors
 - 4. Provide loose stops and moldings on inside of hollow metal work.
 - Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

2.11 STEEL FINISHES

- A. Prime Finish: Apply manufacturer's standard epoxy primer immediately after cleaning and pretreating.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2. Refer to Section 099000 – PAINTING AND COATING for field-applied coating.

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 roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:
 - 1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - 2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - 3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - 4. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.
- C. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.
 - Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-protection-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.

- c. Install frames with removable glazing stops located on secure side of opening.
- d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
- e. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
- 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
- 3. Metal-Stud Partitions: Solidly pack insulation behind frames.
- 4. Masonry Walls: Coordinate installation of frames to allow for filling space between frames and masonry with insulation.
- 5. Concrete Walls: Solidly fill space between frames and concrete with insulation.
- 6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
- 7. In-Place Gypsum Board Partitions: Secure frames in place with postinstalled expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
- 8. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.
- 9. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
 - 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
 - 3. Smoke-Control Doors: Install doors according to NFPA 105.
- D. Glazing: Comply with hollow metal manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- C. Metallic-Coated (Galvanized/Galvannealed) Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION

SECTION 081400 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Solid-core flush wood doors for transparent and opaque finishes.
 - 2. Factory finishing for wood doors with transparent finish.
 - 3. Factory fitting flush wood doors to frames and factory machining for hardware.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 064020 INTERIOR ARCHITECTURAL WOODWORK for wood door frames.
 - 2. Section 087100 DOOR HARDWARE for hardware for wood doors.
 - 3. Section 088000 GLAZING for glass and glazing requirements.
 - 4. Section 099000 PAINTING AND COATING for field finishing of opaque wood doors.

1.3 SUBMITTALS

- A. Product Data: For each type of product, including the following:
 - 1. Door core and edge construction, face type, and trim for openings.
 - 2. Factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:
 - 1. Door schedule indicating door and frame location, type, size, fire protection rating, and swing.
 - Door elevations, dimension and locations of hardware, lite cutouts, and glazing thicknesses.
 - 3. Details of frame for each frame type, including dimensions and profile.
 - 4. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
 - 5. Dimensions and locations of blocking for hardware attachment.
 - 6. Dimensions and locations of mortises and holes for hardware.
 - 7. Clearances and undercuts.
 - 8. Requirements for veneer matching.
 - 9. Doors to be factory primed or finished and application requirements.

C. Samples for Verification:

- Factory finishes applied to actual door face materials, approximately 8 by 10 inches for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of finish color, sheen, and grain to be expected in finished work.
- 2. Frames for light openings, 6 inches long, for each material, type, and finish required.
- D. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer.
- B. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."
 - 1. WDMA I.S.1-A Performance Grade: Extra Heavy Duty.
- C. Fire-Rated Door Inspector Qualifications: Inspector for field quality-control inspections of firerated door assemblies shall comply with qualifications set forth in NFPA 80, Section 5.2.3.1 and the following:
- D. Egress Door Inspector Qualifications: Inspector for field quality-control inspections of egress door assemblies shall comply with qualifications set forth in NFPA 101, Section 7.2.1.15.4 and the following:
- E. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
 - Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies
 provide certification by a qualified testing agency that doors comply with standard
 construction requirements for tested and labeled fire-rated door assemblies except for
 size
 - 2. Temperature-Rise Limit: At vertical exit enclosures and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
- F. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing in accordance with UL 1784 and installed in compliance with NFPA 105.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in plastic bags or cardboard cartons.
- C. Mark each door on top rail with opening number used on Shop Drawings.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and HVAC system is operating and maintaining temperature and relative humidity at levels designed for building occupants for the remainder of construction period.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form, signed by manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, have warped (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section, or show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
 - 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 - 2. Warranty shall include hardware installation and replacement of glass and glazing.
 - 3. Warranty shall be in effect during the following period of time from date of Substantial Completion:
 - a. Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Lambton Doors; EnviroDesign Series.
 - 2. Masonite Architectural; Aspiro Series (formerly Algoma and Marshfield).
 - 3. Oregon Doors; Architectural Series.
 - 4. VT Industries Inc.; Eggers and Heritage collections.

2.2 DOOR CONSTRUCTION, GENERAL

- A. Doors for Transparent Finish:
 - 1. Grade: AWI Premium, with AWI Grade AA faces, 4 inch veneer width.
 - 2. Species and Cut: White Oak, plain sawn/sliced.
 - Match between Veneer Leaves: Book match.
 - 4. Assembly of Veneer Leaves on Door Faces: Center-balance.
 - Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
 - 6. Transom Match: Continuous match.
 - 7. Stiles: Same species as face.
 - 8. Cross-Banding: 1/8 in. high density fiberboard, no added formaldehyde (NAF).
 - 9. Adhesives: WDMA T.M.-6, Type I.
- B. Doors for Opaque Finish:

- 1. Grade: Premium.
- 2. Faces for Interior Doors: Either medium-density overlay (MDO) or high-density fiberboard (HDF).
- 3. Stiles: Match face.
- 4. Cross-Banding: 1/8 in. high density fiberboard, no added formaldehyde (NAF).
- 5. Adhesives: WDMA T.M.-6, Type I.
- 6. Factory Primer: Manufacturer's standard water-based low VOC primer.

2.3 SOLID-CORE DOORS

- A. Cores: Comply with the following requirements:
 - 1. Composite Wood, General: CARB II compliant or made with binder containing no added formaldehyde (NAF).
 - 2. Particle Core: ANSI A 208.1, Grade 1-LD-2.
 - 3. Agrifiber Core: ANSI A 208.1, Grade 1-LD-2.
 - 4. Structural Composite Lumber Core: WDMA I.S.10, Timberstrand LSL.
 - 5. Provide doors with structural composite lumber cores instead of particleboard cores at locations where exit devices are indicated or where light cutouts exceed 40% of the door area.

B. Interior Veneer-Faced Doors:

1. Construction: Five plies, hot-pressed, with stiles and rails bonded to core, then entire unit abrasive planed before veneering.

C. Fire-Rated Doors:

- Construction: Construction and core specified above for type of face indicated or manufacturer's standard mineral-core construction as needed to provide fire rating indicated.
 - a. Fire Retardant Mineral Core, with no added formaldehyde cross-banding.
- 2. Blocking: For mineral-core doors, provide composite blocking with improved screw-holding capability approved for use in doors of fire ratings indicated as needed to eliminate through-bolting hardware.
- 3. Edge Construction: At hinge stiles, provide manufacturer's standard laminated-edge construction with improved screw-holding capability and split resistance and with outer stile matching face veneer.
 - a. Screw-Holding Capability: 550 lbf per WDMA T.M.-10.
- 4. Pairs: Provide fire-rated pairs with fire-retardant stiles matching face veneer that are labeled and listed for kinds of applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals.

2.4 LIGHT FRAMES

- A. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads unless otherwise indicated.
 - 1. Wood Species: Same species as door faces.

- 2. Profile: Manufacturer's standard shape.
- 3. At wood-core doors with 20-minute fire-protection ratings, provide wood beads and metal glazing clips approved for such use.
- B. Wood-Veneered Beads for Light Openings in Fire Doors: Manufacturer's standard wood-veneered noncombustible beads matching veneer species of door faces and approved for use in doors of fire rating indicated. Include concealed metal glazing clips where required for opening size and fire rating indicated.

2.5 GLAZING SYSTEMS

A. Glazing: Provide factory installed glass products in accordance with requirements in Section 088000 - GLAZING.

2.6 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels, unless otherwise indicated:
 - 1. Comply with clearance requirements of referenced quality standard for fitting. Comply with requirements in NFPA 80 for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, ANSI/BHMA/DHI A115-W series standards, and hardware templates.
 - Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining. Drill pilot holes for screws for butt hinges and lock fronts at the factory.
 - 2. Metal Astragals: Factory prime and premachine astragals and formed-steel edges for hardware for pairs of fire-rated doors to receive concealed vertical rod exit devices.
- C. Transom and Side Panels: Fabricate matching panels with same construction, exposed surfaces, and finish as specified for associated doors. Finish bottom edges of transoms and top edges of rabbeted doors same as door stiles.
 - 1. Fabricate door and transom panels with full-width, solid-lumber meeting rails. Provide factory-installed spring bolts for concealed attachment into jambs of metal doorframes.
- D. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required.
 - 1. Light Openings: Trim openings with moldings of material and profile indicated.
 - 2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 GLAZING.

2.7 FACTORY FINISHING

- A. General: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated" for factory finishing.
- B. Doors for Opaque Finish: Factory prime faces and edges of doors, including cutouts, with one coat of wood primer specified in Section 099000 PAINTING AND COATING.

- C. Doors for Transparent Finish: Factory finish doors that are indicated to receive transparent finish. Finish faces and edges of doors, including cutouts.
- D. Transparent Finish:
 - 1. Grade: Premium.
 - 2. Finish: AWS System-9, UV Curable, Acrylated Epoxy, Polyester or Urethane.
 - 3. Staining: Provide water-based stain, custom color as selected by Architect.
 - Sheen: Satin.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
 - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Section 087100 DOOR HARDWARE.
- B. Install doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.
 - 1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
 - 2. Install smoke- and draft-control doors according to NFPA 105.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 FIELD QUALITY CONTROL

- A. Inspection Agency: Engage a qualified inspector to perform inspections and to furnish reports to Architect.
- B. Inspections:
 - Fire-Rated Door Inspections: Inspect each fire-rated door in accordance with NFPA 80, Section 5.2
 - 2. Egress Door Inspections: Inspect each door equipped with panic hardware, each door equipped with fire exit hardware, each door located in an exit enclosure, each electrically controlled egress door, and each door equipped with special locking arrangements in accordance with NFPA 101, Section 7.2.1.15.

- C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
- D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.
- E. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 80 and NFPA 101.

3.4 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Protection: Provide temporary protection to ensure work being without damage or deterioration at time of final acceptance. Remove protections and reclean as necessary immediately before final acceptance.
- C. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

SECTION 082250 - POLYESTER FACED DOORS AND ALUMINUM FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Fiberglass reinforced polyester (FRP) faced doors
 - 2. Aluminum frames for FRP doors, including frames for sidelites and transoms.
 - 3. Installation of hardware (except surface mounted hardware).
- B. Related sections include the following:
 - 1. Division 07 Section "Joint Sealants" for joint sealants installed as part of aluminum entrance and storefront systems.
 - 2. Division 08 Section "Door Hardware."
 - 3. Division 08 Section "Glazing."

1.2 SYSTEM DESCRIPTION

- A. General: Provide polyester faced doors and aluminum framing systems capable of withstanding loads and thermal and structural movement requirements indicated without failure, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Thermal Movements: Provide polyester faced doors and aluminum framing systems, including anchorage, that accommodate thermal movements of systems and supporting elements resulting from the following maximum change(range) in ambient and surface temperatures without buckling, damaging stresses on glazing, failure of joint sealants, damaging loads on fasteners, failure of doors or other operating units to function properly, and other detrimental effects.
 - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- C. Structural-Support Movement: Provide polyester faced doors and aluminum framing systems that accommodate structural movements including, but not limited to, sway and deflection.
- D. Dimensional Tolerances: Provide polyester faced doors and aluminum framing systems that accommodate dimensional tolerances of building frame and other adjacent construction.

1.3 SUBMITTALS

- A. Product data including specifications, standard details, and installation recommendations for polyester faced doors and panels and aluminum frames including test reports certifying that products have been tested and comply with performance requirements, details of core and edge construction, trim for openings, and finish.
- B. Shop drawings showing fabrication and installation of polyester faced doors, panels and frames. Include elevations of door design types, details of construction, location and installation requirements of door hardware and reinforcements, and details of openings.
 - 1. Provide schedule of doors indicating sizes, locations, and other pertinent information using same reference numbers for details and openings as those on contract drawings.
- C. Samples for initial selection purposes in form of manufacturer's color charts showing full range of colors available for doors and panels.
- D. Samples for Verification Purposes: Submit 6" square samples of each color of face sheet specified and 12" long sections of aluminum extrusions with specified finish system applied. Where normal color and texture variations are to be expected, include 2 or more units in each set of samples showing limits of such variations.

1.4 QUALITY ASSURANCE

- A. Single Source Responsibility: Provide doors and frames produced by single manufacturer for entire Project.
- B. Manufacturer Qualifications: Provide product series that has been produced by the manufacturer for at least five years, for similar building type and size as this project.
- C. Installer's Qualifications: Firm with not less than 4 years' successful experience installing systems similar to those required.
- D. Fire Performance Characteristics: Where indicated, provide class "A" fiber reinforced polyester faces with the following surface burning characteristics as determined by testing identical products per ASTM E 84 by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction.
 - 1. Flame Spread: 25 or less.
 - 2. Smoke Developed: 450 or less.
- E. Design Criteria: The construction documents are based on a specific polyester door faced and aluminum frame system. Other manufacturers' system of similar and equivalent nature will be acceptable when, in Architect's judgement, differences do not materially detract from design concept or intended performance.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver doors cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to surface finishes.
- B. Inspect doors upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4-inches high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4-inches spaces between stacked doors to promote air circulation.
- D. Identify each door and frame with individual opening numbers which correlate with designation system used on shop drawings for door, frames, and hardware, using temporary, removable or concealed markings.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Check openings by field measurement before fabrication to ensure proper fitting of work; show measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay in work.
- B. Coordinate work of this section with that specified in Section 087100 to ensure proper installation of hardware.

1.7 WARRANTY

- A. Product Warranty: Provide manufacturer's standard written warranty agreeing to repair or replace polyester faced doors which fail in materials or workmanship within time period indicated below. Warranty shall include door manufacturer's guarantee that hardware installed by factory will be installed correctly and not come loose within time period indicated below.
 - 1. Warranty period for doors and finish, and hardware installed by factory is ten years after date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Provide polyester faced doors, panels and aluminum frames manufactured by one of following:
 - 1. Special-Lite, Inc.
 - 2. Tubelite, Inc.
 - 3. Commercial Door Systems.

2.2 MATERIALS

- A. Aluminum Members: Alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish; comply with ASTM B 221 for extrusions and ASTM B 209 for sheet and plate.
- B. Steel Reinforcement: Complying with ASTM A 36 (ASTM A 36M)) for structural shapes, plates, and bars; ASTM A 611 for cold-rolled sheet and strip; or ASTM A 570 (ASTM A 570M) for hot-rolled sheet and strip.
- C. Fiberglass Reinforced Polyester Face Material: 0.120" minimum thickness, with color integral through full thickness of face sheet. Provide sandstone textured finish for doors and panels. Face material meeting the following performance criteria:
 - 1. Impact Strength of Face Sheets: ASTM D 256, Izod Impact Strength, 15 foot pounds per inch of notch.
 - 2. Abrasion Resistance of Face Sheets: ASTM D 1242, 25 cycles of Taber Abraser with CH-17 wheel with a 1000 gram load, not to exceed 0.029 percent weight loss.
 - 3. Hardness of Face Sheets: ASTM D 2583, Barcol Meter Hardness Test, not less than 55.
 - 4. Humidity Resistance of Face Sheets: ASTM D 570, water absorption not more than 0.40 percent weight gain after 24-hour immersion.
 - 5. Ultra-Violet Degradation: Only slight color change, and negligible change in surface gloss and other physical properties after exposure to 500,000 Langleys.
 - 6. Fire-Resistance and Flammability: Provide Class A rated faces for door faces of interior doors and for interior face of exterior doors and panels.
 - 7. Product: SpecLite 3 FRP by Special Lite, or equivalent.
 - 8. Per 2015 IBC 2603.4.1.7 for non-rated swing doors with plastic foam cores- provide a thermal barrier of not less than 0.032" thick aluminum or steel with basic thickness of not less than 0.016" between the foam core and FRP skin; or complying with NFPA 275 per IBC 2603.4.
- D. Core Material: Urethane foam of 5 pounds per cubic foot density for doors and panels.
- E. Fasteners: Aluminum or stainless steel materials warranted by manufacturer to be non-corrosive and compatible with aluminum components, hardware, anchors and other components.
- F. Brackets and Reinforcements: Manufacturer's high-strength aluminum extrusions. Provide manufacturers' standard reinforcement for each type of hardware required.
- G. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements, except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.
- H. Spacers, Setting Blocks, Gaskets, and Bond Breakers: Manufacturer's standard permanent, nonmigrating types in hardness recommended by manufacturer, compatible with sealants, and suitable for system performance requirements.

- I. Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint type.
- J. Sealants and joint fillers for joints at perimeter of entrance and storefront systems as specified in Division 07 Section "Joint Sealants."
- K. Glazing: 1" insulating glass units as specified in Division 08 Section "Glazing."

2.3 DOORS

- A. General: Provide manufacturer's standard flush and wide stile style doors as indicated on Drawings constructed of aluminum stiles and rails joined with steel tie rods, with polyester face sheets and foamed-in-place urethane inner core. Minimum thermal rating U-factor of 0.09.
 - 1. Basis of Design Product: Provide Sandstone FRP Flush Door Model SL-20 by Special Lite, or equivalent.
 - 2. Color shall be as selected by Architect.
- B. Provide extruded aluminum 2-7/16" tubular stiles designed to accept specified hardware and a minimum extruded aluminum 2-5/16" top and bottom rails with legs for interlocking rigidity weather bar. Minimum thickness of 1/16 inches at face and 1/8 inch at hinge and concealed vertical stiles.
 - 1. Meeting Stiles: Pile brush weatherseals. Extrude meeting stile to include integral pocket to accept pile brush weatherseals.
 - 2. Bottom of Door: Install bottom weather bar with nylon brush weatherstripping into extruded interlocking edge of bottom rail.
- C. Lock polyester face sheets in on all four sides by extruded interlocking edges which are integral part of stiles and rails. Snap in or applied door edge trim is not acceptable.
- D. Miter or mortise and tenon corner joints and mechanically fasten with reinforcing brackets that incorporate concealed minimum 3/8" galvanized steel tie-rods at top and bottom with aviation type nuts.
- E. Internally reinforce doors to receive specified hardware with .125 inch thick aluminum.
- F. Foam-in-place core after the door is completely assembled.
- G. Manufacture doors with cutouts for required vision lites. Provide screw-applied aluminum stops to match perimeter door rails.

2.4 FRAMES

A. Retrofit Frame: Provide extruded aluminum frame members designed to cover existing metal frames, fabricated from minimum 3/8" thick aluminum extrusions, in sizes indicated

on Drawings and as required to cover existing frames. Supply with door stop, with heavy duty weathering pile included.

- 1. Basis of Design Product: Insert Frames, Model SL-1030 Series, by Special Lite, or equivalent.
- 2. Provide SL-70 Capping System by Special Lite in .062" thick aluminum in conjunction with inset frames as required to completely cover existing door frames to remain.
- B. Standard Frame: Provide tubular extruded aluminum frame members, 2 by 4-1/2 inch in size unless otherwise indicated on drawings, with minimum 1/8 inch thick walls and closed back. Fabricate with mechanical joints using heavy inserted reinforcing plates and concealed tie-rods or j-bolts. Supply with ½ by 1-1/4 inch door stop, with heavy duty weathering pile included.
 - 1. Provide Tube Frame with Applied Stops, Model SL-245, by Special Lite, or equivalent.

2.5 HARDWARE

A. Hardware is specified in Section 087100.

2.6 FABRICATION

- A. Factory-prefit and premachine doors for all hardware and to fit frame opening sizes indicated with the following uniform clearances and bevels:
 - 1. Clearances: Not more than 1/8 inch at jambs and heads except between pairs of doors not more than 1/4 inch. Not more than 3/4 inch at bottom.
 - 2. Comply with final hardware schedules and door frame shop drawings and with hardware templates.
 - 3. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with factory premachining.
- B. Complete fabrication, assembly, installation of hardware, finishing and other work before shipment to project site. Disassemble components only as necessary for shipment and installation. Field stick framing is not acceptable.
- C. Factory install vision lites and panels.
- D. Install hinges and all other hardware, with the exception of any surface-applied hardware such as door closer and locksets or push/pull hardware, at the manufacturer's plant.
 - 1. Locate hardware as indicated on final shop drawings or, if not indicated, in accordance with "Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames," published by Door and Hardware Institute.

- E. Separate dissimilar metals with zinc chromate primer, bituminous paint, or other separator to prevent corrosion.
- F. Maintain accurate relation of planes and angles, hairline fit contacting members.
- G. Conceal fasteners where possible provide countersunk flat or oval heads for exposed screws and bolts.

2.7 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations related to applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.
- D. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - Fluoropolymer 3-Coat System: Manufacturer's standard 3-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color topcoat and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605.
 - 2. Color: As selected by Architect.
 - 3. Provide where scheduled.
- E. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
 - 1. Provide where scheduled

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and supports, with the Installer present, for compliance with requirements indicated, installation tolerances, and other conditions that affect installation of polyester faced doors. Correct unsatisfactory conditions before proceeding with the installation.
- B. Examine door frames prior to hanging door:
 - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
 - 2. Reject doors with defects.
- C. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Comply with manufacturer's written instructions for protecting, handling, and installing FRP doors and aluminum framing systems. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints.
- B. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint
- C. Install framing components plumb and true in alignment with established lines and grades without warp or rack of framing members.
- D. Install doors and frames plumb and true in alignment with established lines and grades without warp or rack. Lubricate operating hardware and other moving parts according to hardware manufacturers' written instructions.
 - 1. Install surface-mounted hardware according to manufacturer's written instructions using concealed fasteners to greatest extent possible.
 - 2. Install frames with anchors appropriate for wall conditions to anchor framing to wall materials. A minimum of five anchors up to 7'- 4" on jamb members, and one additional anchor for each 12 inches over that height.
- E. Construction Tolerances: Install doors and frames to comply with the following tolerances:
 - 1. Variation from Plane: Do not exceed 1/16 inch in 12 feet of length or 1/8 inch in any total length.
 - 2. Offset from Alignment: The maximum offset from true alignment between two identical members abutting end to end in line shall not exceed 1/16 inch.
 - 3. Diagonal Measurements: The maximum difference in diagonal measurements shall not exceed 1/8 inch.

- 4. Offset at Corners: The maximum out-of-plane offset of framing at corners shall not exceed 1/32 inch.
- F. Separate aluminum and other corrodible metal surfaces from sources of corrosion or electrolytic action at points of contact with other materials.
 - 1. Zinc or cadmium plate steel anchors and other unexposed fasteners after fabrication.
 - 2. Paint dissimilar metals where drainage from them passes over aluminum.
 - 3. Paint aluminum surfaces in contact with mortar, concrete or other masonry with alkali resistant coating.
 - 4. Paint wood and similar absorptive material in contact with aluminum and exposed to the elements or otherwise subject to wetting, with two coats of aluminum house paint. Seal joints between the materials with sealant.
- G. Drill and tap frames and doors and apply surface-mounted hardware items. Comply with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible. Refer to Section 087100 for additional installation requirements.
- H. Install perimeter sealant to comply with requirements of Division 07 Section "Joint Sealants," unless otherwise indicated.
- 3.3 ADJUSTING, CLEANING AND PROTECTION
 - A. Adjust operating hardware to function properly, for smooth operation without binding, and for weathertight closure.
 - B. Clean complete system, inside and out, promptly after installation, exercising care to avoid damage to coatings.
 - C. Institute protective measures required throughout remainder of construction period to ensure polyester faced doors will be without damage and deterioration, other than normal weathering, at time of acceptance.

END OF SECTION 082250

SECTION 083110 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Access doors and frames for walls and ceilings.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 033000 CAST-IN-PLACE CONCRETE for blocking out openings for access doors and frames in concrete.
 - 2. Section 042000 UNIT MASONRY for anchoring and grouting access door frames set in masonry construction.
 - 3. Section 087100 DOOR HARDWARE for rim cylinder locks and master keying.

1.3 SUBMITTALS

- A. Product Data: For each type of access door and frame indicated. Include construction details, fire ratings, materials, individual components and profiles, and finishes.
- B. Shop Drawings: Show fabrication and installation details of access doors and frames for each type of substrate. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each door face material, at least 3 by 5 inches in size, in specified finish.
- D. Access Door and Frame Schedule: Provide complete access door and frame schedule, including types, locations, sizes, latching or locking provisions, and other data pertinent to installation.
- E. Ceiling Coordination Drawings: Reflected ceiling plans, drawn to scale, on which ceiling-mounted items including access doors and frames, lighting fixtures, diffusers, grilles, speakers, sprinklers, and special trim are shown and coordinated with each other.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of access door and frame through one source from a single manufacturer.
- B. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to access door and frame assemblies tested for fire-test-response characteristics per the following test method and that are listed and labeled by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. NFPA 252 for vertical access doors and frames.
 - 2. ASTM E 119 for horizontal access doors and frames.
- C. Size Variations: Obtain Architect's acceptance of manufacturer's standard-size units, which may vary slightly from sizes indicated.

1.5 COORDINATION

A. Verification: Determine specific locations and sizes for access doors needed to gain access to concealed plumbing, mechanical, or other concealed work, and indicate in the schedule specified in "Submittals" Article.

PART 2 - PRODUCTS

2.1 STEEL MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
 - 1. ASTM A 123/A 123M, for galvanizing steel and iron products.
 - 2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.
- B. Steel Sheet: Electrolytic zinc-coated, ASTM A 879/A 879M with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.
- C. Steel Finishes: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - Surface Preparation for Steel Sheet: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
 - a. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.
 - 2. Factory-Primed Finish: Apply shop primer immediately after cleaning and pretreating.

D. Drywall Beads: Edge trim formed from 0.0299-inch zinc-coated steel sheet formed to receive joint compound and in size to suit thickness of gypsum board.

2.2 STAINLESS-STEEL MATERIALS

- A. Rolled-Stainless-Steel Floor Plate: ASTM A 793, manufacturer's standard finish.
- B. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 316. Remove tool and die marks and stretch lines or blend into finish.
 - 1. Finish: Directional Satin Finish, No. 4.

2.3 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Acudor Products, Inc.
 - 2. Babcock-Davis.
 - 3. Dur-Red Products.
 - 4. JL Industries (a division of Activar Construction Products Group).
 - 5. Karp Associates, Inc.
 - 6. Larsen's Manufacturing Company.
 - 7. Milcor Inc.
 - 8. Nystrom, Inc.
- B. Flush Access Doors and Trimless Frames: Fabricated from steel sheet at typical areas and from stainless-steel sheet at toilet and wet areas.
 - 1. Locations: Wall and ceiling surfaces.
 - 2. Door: Minimum 0.060-inch-thick sheet metal, set flush with surrounding finish surfaces
 - 3. Frame: Minimum 0.060-inch-thick sheet metal with drywall bead flange.
 - 4. Hinges: Continuous piano.
 - 5. Lock: Cylinder.
 - a. Lock Preparation: Prepare door panel to accept cylinder specified in Section 087100, DOOR HARDWARE.
- C. Recessed Access Doors and Trimless Frames: Fabricated from steel sheet at typical areas and from stainless-steel sheet at toilet and wet areas.
 - 1. Locations: Wall and ceiling surfaces.
 - 2. Door: Minimum 0.060-inch-thick sheet metal in the form of a pan recessed 5/8 inch for gypsum board infill.
 - 3. Frame: Minimum 0.060-inch-thick sheet metal with drywall bead for gypsum board surfaces.
 - 4. Hinges: Concealed pivoting rod hinge.

- 5. Lock: Cylinder.
 - a. Lock Preparation: Prepare door panel to accept cylinder specified in Section 087100, DOOR HARDWARE.
- D. Fire Rated, Uninsulated, Flush Access Doors and Frames with Exposed Trim: Fabricated from steel at typical areas and from stainless-steel sheet at toilets and wet areas.
 - 1. Locations: Wall surfaces.
 - 2. Fire-Resistance Rating: Not less than that of adjacent construction.
 - 3. Door: Minimum 0.060-inch-thick sheet metal, flush construction.
 - 4. Frame: Minimum 0.060-inch-thick sheet metal with 1-inch-wide, surface-mounted trim.
 - 5. Hinges: Continuous piano.
 - 6. Automatic Closer: Spring type.
 - 7. Lock: Self-latching device with cylinder lock.
 - a. Lock Preparation: Prepare door panel to accept cylinder specified in Section 087100, DOOR HARDWARE

2.4 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.
 - 1. For trimless frames with drywall bead, provide edge trim for gypsum board and gypsum base securely attached to perimeter of frames.
 - 2. For trimless frames with plaster bead for full-bed plaster applications, provide zinc-coated expanded metal lath and exposed casing bead welded to perimeter of frames.
 - 3. Provide mounting holes in frames for attachment of units to metal or wood framing.
 - 4. Provide mounting holes in frame for attachment of masonry anchors.
- D. Recessed Access Doors: Form face of panel to provide recess for application of applied finish. Reinforce panel as required to prevent buckling.
 - 1. For recessed doors with plaster infill, provide self-furring expanded metal lath attached to door panel.

- E. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.
 - 1. For cylinder lock, furnish two keys per lock and key all locks alike.
 - 2. For recessed panel doors, provide access sleeves for each locking device. Furnish plastic grommets and install in holes cut through finish.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.
- B. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.
- C. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

3.2 ADJUSTING AND CLEANING

- A. Adjust doors and hardware after installation for proper operation.
- B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION

SECTION 084110 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Exterior and interior aluminum-framed storefronts.
 - 2. Exterior and interior manual-swing aluminum doors.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 079200 JOINT SEALANTS for installation of joint sealants installed with aluminum-framed systems and for sealants to the extent not specified in this Section.
 - 2. Section 087100 DOOR HARDWARE for lock cylinders and keying.
 - 3. Section 088000 GLAZING for glazing requirements to the extent not specified in this Section
 - 4. Section 089000 LOUVERS AND VENTS for units installed with aluminum-framed systems.

1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design entrance and storefront system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. General: Provide aluminum-framed systems, including anchorage, capable of withstanding, without failure, the effects of the following:
 - 1. Structural loads.
 - 2. Thermal movements.
 - 3. Dimensional tolerances of building frame and other adjacent construction.
 - Failure includes the following:
 - a. Deflection exceeding specified limits.
 - b. Thermal stresses transferred to building structure.
 - c. Framing members transferring stresses, including those caused by thermal and structural movements, to glazing.
 - d. Noise or vibration created by wind and thermal and structural movements.
 - e. Loosening or weakening of fasteners, attachments, and other components.
 - f. Sealant failure.

- g. Failure of operating units to function properly.
- C. Structural Loads: Wind and seismic loads as indicated on the Structural Drawings, but not less than that required by Code.
- D. Deflection of Framing Members:
 - Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches (and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less
 - 2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller, amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components directly below to less than 1/8 inch and clearance between members and operable units directly below to less than 1/16 inch.
- E. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- F. Air Infiltration: Provide doors and storefront which comply with the following. Test unit in accordance with ASTM E 283.
 - Swinging Entrance Doors, ASHRAE Requirement: 1.0 cfm/sf maximum air leakage at a pressure differential of 1.57 psf.
 - 2. Storefront, ASHRAE Requirement: 0.06 cfm/sf maximum air leakage at a pressure differential of 1.57 psf or higher.
- G. Water Leakage Test: Test fixed framing system in accordance with ASTM E 331.
 - 1. Test Pressure: 8 psf.
 - 2. Performance: No leakage as defined in test method at specified test pressure. No uncontrolled water penetrating system or appearing on normally exposed interior surfaces.
- H. Solar Heat-Gain Coefficient: Provide units with a whole-unit SHGC maximum as required by Code, determined according to NFRC 200 procedures. Submit proof of compliance with submittals as specified.
- I. Thermal Transmittance: Provide window units that have a U-value as required by Code rated in BTU/hour/sq. ft./degrees F at 15-mph exterior wind velocity, when tested in accordance with AAMA 1503.1. Test unit to be 4 ft. x 6 ft. Submit proof of compliance with submittals as specified.
- J. Condensation Resistance: Provide aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 65 for fixed storefront units and not less than 55 for doors when tested according to AAMA 1503.

1.4 SUBMITTALS

- A. Product Data: Include installation instructions, construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of product indicated. Indicate special procedures and perimeter conditions requiring special attention.
- B. Shop Drawings: Prepared under the supervision of a qualified professional engineer detailing fabrication and assembly of aluminum-framed systems. For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.
 - 1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 2. Include structural analysis of story drift and deflection from anticipated live loads, and determination whether head receptors are required.
 - 3. Include details of provisions for system expansion and contraction and for draining moisture occurring within the system to the exterior.
 - 4. For entrances, include hardware schedule and indicate operating hardware types, functions, quantities, and locations.
 - 5. Wiring diagrams for power, signal, and control wiring.
 - 6. Activation and safety devices.
 - 7. Include full-size isometric details of each vertical-to-horizontal intersection of storefronts, showing the following:
 - a. Joinery, including concealed welds.
 - b. Anchorage.
 - c. Expansion provisions
 - d. Glazing
 - e. Flashing and drainage.
 - 8. Include details showing interface with perimeter conditions to depict interface with adjacent thermal, weather, air and vapor barriers, and adjacent flashings.
 - 9. Shop drawings must be signed and stamped by a professional engineer.
- C. Delegated-Design Submittal: For entrance and storefront systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation. Show structural testing for attachment of the storefront to the existing structure. Contractor should survey slab edge locations and conditions of the embeds to develop the attachment details.
- Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- E. Qualification Data: For Installer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for aluminum-framed systems.
- G. Performance Reports: Based on systems, components and glazing methods proposed for use on this Project, proof that units as glazed for this Project meet or exceed Code requirements for the following:
 - 1. U-value.

- 2. Solar heat-gain coefficient.
- H. Maintenance Data: For aluminum-framed systems to include in maintenance manuals.
- I. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of entrance and storefront systems that are similar to those indicated for this Project in material, design, and extent.
- C. Installer Qualifications: Capable of assuming engineering responsibility and performing work of this Section and who is acceptable to manufacturer.
- D. Accessible Entrances: Comply with authorities having jurisdiction, local state building code and the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."
- E. Preinstallation Conference: Conduct conference at Project site. Review methods and procedures related to storefront system, including, but not limited to, the following:
 - 1. Review structural load limitations.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review required testing, inspection, and certifying procedures.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.
 - Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating aluminum-framed systems without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.7 WARRANTY

- A. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

- B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of automatic entrances that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Faulty operation of operators, controls, and hardware.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
 - 2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Exterior Storefront, Thermal Break, 2 inch by 4-1/2 inch profile:
 - a. Basis of Design: Kawneer North America, VG451T.
 - b. EFCO Corporation, 403X.
 - c. Oldcastle BuildingEnvelope, 3000XT.
 - d. Tubelite Inc., TU24000.
 - e. YKK AP America Inc., YES 45 XT.
 - 2. Interior Storefront, 1-3/4 inch by 4-1/2 inch profile:
 - a. Basis of Design: Kawneer North America, Trifab 400.
 - b. EFCO Corporation, 401 NT.
 - c. Oldcastle BuildingEnvelope, FG-1000.
 - d. Tubelite Inc., INT45.
 - e. YKK AP America Inc., YES 40 FS.
 - 3. Interior Doors, Wide Stile:
 - a. Basis of Design: Kawneer North America, 500.
 - b. EFCO, a Pella Company, D-500.
 - c. Oldcastle BuildingEnvelope, WS-500.
 - d. Tubelite Inc., Wide.
 - e. YKK AP America Inc., 50D.
 - 4. Exterior Doors, Wide Stile, Thermally-Broken:
 - a. Basis of Design: Kawneer North America, Tuffline 500 Series.
 - b. EFCO, a Pella Company, D-502.
 - c. Oldcastle BuildingEnvelope, WS-500TC.
 - d. Tubelite Inc., Wide Thermal Block.
 - e. YKK AP America Inc., 50XT.

2.2 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - 1. Sheet and Plate: ASTM B 209.
 - 2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
 - 3. Extruded Structural Pipe and Tubes: ASTM B 429.
 - 4. Structural Profiles: ASTM B 308/B 308M.
 - 5. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.
- B. Steel Reinforcement: With manufacturer's standard corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
 - 1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 - 2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
 - 3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.3 FRAMING SYSTEMS

- A. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 - 1. Construction: Dual thermal-break.
- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
 - 2. Reinforce members as required to receive fastener threads.
 - 3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.
- D. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- E. Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials. Form exposed flashing from sheet aluminum finished to match framing and of sufficient thickness to maintain a flat appearance without visible deflection.
- F. Framing System Gaskets and Sealants: Manufacturer's standard recommended by manufacturer for joint type.

2.4 GLAZING SYSTEMS

A. Glazing: As specified in Section 088000 - GLAZING.

- B. Glazing Gaskets: Manufacturer's standard compression types, replaceable, molded or extruded, that maintain uniform pressure and watertight seal.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric types.

2.5 DOORS

- A. Doors: Manufacturer's standard glazed doors, for manual swing operation.
 - 1. Door Construction: Mechanical clip fastening, SIGMA deep penetration plus welds and 1-1/8 inch long fillet welds inside and outside of all four corners. Glazing stops shall be hook-in type and EPDM glazing gaskets reinforced with non-stretchable cord.

2.6 DOOR HARDWARE

- A. General: Provide heavy-duty units in sizes and types recommended by entrance system and hardware manufacturers for entrances and uses indicated.
 - 1. Opening-Force Requirements:
 - a. Egress Doors: Not more than 30 lbf required to set door in motion and not more than 15 lbf required to open door to minimum required width.
 - b. Accessible Interior Doors: Not more than 5 lbf.
- B. Hardware Sets: Provide as specified in Section 087100 DOOR HARDWARE.

2.7 ACCESSORY MATERIALS

- A. Insulating Materials: As specified in Section 072100 THERMAL INSULATION.
- B. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Section 079200 JOINT SEALANTS.
- C. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

2.8 FABRICATION

- A. Form aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Means to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.

- 5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
- 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing (without projecting stops).
- E. Door Frames: Reinforce as required to support loads imposed by door operation and for installing hardware.
 - 1. At exterior doors, provide compression weather stripping at fixed stops.
 - 2. At interior doors, provide silencers at stops to prevent metal-to-metal contact. Install three silencers on strike jamb of single-door frames and two silencers on head of frames for pairs of doors.
- F. Doors: Reinforce doors as required for installing hardware.
 - 1. At pairs of exterior doors, provide sliding weather stripping retained in adjustable strip mortised into door edge.
 - 2. At exterior doors, provide weather sweeps applied to door bottoms.
- G. Hardware Installation: Factory install hardware to the greatest extent possible. Cut, drill, and tap for factory-installed hardware before applying finishes.
- H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.9 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- C. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General:
 - 1. Comply with manufacturer's written instructions.

- 2. Do not install damaged components.
- 3. Fit joints to produce hairline joints free of burrs and distortion.
- 4. Rigidly secure nonmovement joints.
- 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
- 6. Seal joints watertight, unless otherwise indicated.

B. Metal Protection:

- 1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.
- 2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
- D. Set continuous sill members and flashing in full sealant bed as specified in Section 079200 JOINT SEALANTS and to produce weathertight installation.
- E. Install components plumb and true in alignment with established lines and grades, without warp or rack.
- F. Install glazing as specified in Section 088000 GLAZING.
 - 1. Structural-Sealant Glazing:
 - Prepare surfaces that will contact structural sealant according to sealant manufacturer's written instructions to ensure compatibility and adhesion.
 Preparation includes, but is not limited to, cleaning and priming surfaces.
 - b. Install weatherseal sealant according to Section 079200 JOINT SEALANTS and according to sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind sealant as recommended by sealant manufacturer.
- G. Entrances: Install to produce smooth operation and tight fit at contact points.
 - 1. Exterior Entrances: Install to produce tight fit at weather stripping and weathertight closure.
 - 2. Field-Installed Hardware: Install surface-mounted hardware according to hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.
- H. Erection Tolerances: Install aluminum-framed systems to comply with the following maximum tolerances:
 - 1. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet; 1/4 inch over total length.
 - 2. Alignment:
 - a. Where surfaces abut in line, limit offset from true alignment to 1/16 inch.
 - b. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch.
 - 3. Diagonal Measurements: Limit difference between diagonal measurement to 1/8 inch.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Services: Testing and inspecting of representative areas to determine compliance of installed systems with specified requirements shall take place as follows and in successive stages as indicated on Drawings. Do not proceed with installation of the next area until test results for previously completed areas show compliance with requirements.
 - 1. Air Infiltration: Areas shall be tested for air leakage of 1.5 times the rate specified for laboratory testing under Part 1 "Performance Requirements" Article, but not more than 0.09 cfm/sq. ft. of fixed wall area when tested according to ASTM E 783 at a minimum static-air-pressure difference of 6.24 lbf/sq. ft.
 - 2. Water Penetration: Areas shall be tested according to ASTM E 1105 at a minimum cyclic static-air-pressure difference of 0.67 times the static-air-pressure difference specified for laboratory testing under Part 1 "Performance Requirements" Article, but not less than 4.18 lbf/sq. ft., and shall not evidence water penetration.
 - 3. Water Spray Test: Before installation of interior finishes has begun, a minimum area of 75 feet by 1 story of aluminum-framed systems designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
- C. Repair or remove work where test results and inspections indicate that it does not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.4 ADJUSTING

- A. Entrances: Adjust operating hardware for smooth operation according to hardware manufacturers' written instructions.
 - 1. For doors accessible to people with disabilities, adjust closers to provide a 3-second closer sweep period for doors to move from a 70-degree open position to 3 inches from the latch measured to the leading door edge.

END OF SECTION

SECTION 084410 - GLAZED ALUMINUM CURTAIN WALLS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Glazed aluminum-framed curtain wall systems.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 078440 FIRE-RESISTIVE JOINT SYSTEMS for perimeter fire-containment systems (safing insulation) field installed with glazed aluminum curtain wall systems.
 - 2. Section 079200 JOINT SEALANTS for installation of joint sealants installed with glazed aluminum curtain wall systems and for sealants to the extent not specified in this Section.
 - 3. Section 084110 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS for entrance and storefront systems.
 - 4. Section 085110 ALUMINUM WINDOWS for windows installed with glazed aluminum curtain wall systems.
 - 5. Section 088000 GLAZING for glass and glazing of aluminum curtain wall systems.
 - 6. Section 089000 LOUVERS AND VENTS for units installed with glazed aluminum curtain wall systems.

1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design glazed curtain wall, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. General: Provide glazed aluminum curtain wall systems, including anchorage, capable of withstanding, without failure, the effects of the following:
 - 1. Structural loads.
 - 2. Thermal movements.
 - 3. Movements of supporting structure indicated on Drawings including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 - 4. Dimensional tolerances of building frame and other adjacent construction.
 - 5. Failure includes the following:
 - a. Deflection exceeding specified limits.
 - b. Thermal stresses transferred to building structure.

- c. Framing members transferring stresses, including those caused by thermal and structural movements, to glazing.
- d. Noise or vibration created by wind and thermal and structural movements.
- e. Loosening or weakening of fasteners, attachments, and other components.
- f. Sealant failure.
- C. Structural Loads: Wind and seismic loads as indicated on the Structural Drawings, but not less than that required by Code.
- D. Structural-Test Performance: Provide glazed aluminum curtain wall systems tested according to ASTM E 330 as follows:
 - 1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
 - 2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
 - 3. Test Duration: As required by design wind velocity but not less than 10 seconds.

E. Deflection of Framing Members:

- 1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches, and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
- 2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller, amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.
- F. Story Drift: Provide glazed aluminum curtain wall systems that accommodate design displacement of adjacent stories indicated.
 - 1. Design Displacement: As indicated on Drawings.
 - 2. Test Performance: No glass breakage, anchor failures, or structural damage when tested according to AAMA 501.4.
- G. Thermal Movements: Provide glazed aluminum curtain wall systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- H. Air Infiltration: Provide glazed aluminum curtain wall systems with maximum air leakage of 0.06 cfm/sq. ft. of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure differential of 6.24 lbf/sq. ft.
- I. Water Penetration Under Static Pressure: Provide aluminum glazed curtain wall systems that do not evidence water penetration when tested according to ASTM E 331 at a minimum differential static pressure of 20 percent of positive design wind load, but not less than 12 lbf/sq. ft.

- Maximum Water Leakage: No uncontrolled water penetrating systems or appearing on systems' normally exposed interior surfaces from sources other than condensation. Water controlled by flashing and gutters that is drained to exterior and cannot damage adjacent materials or finishes is not considered water leakage.
- J. Condensation Resistance: Provide glazed aluminum curtain wall systems with condensation-resistance factor (CRF) of not less than 75 when tested according to AAMA 1503.
- K. Solar Heat-Gain Coefficient: Provide units with a whole-unit SHGC maximum as required by Code, determined according to NFRC 200 procedures. Submit proof of compliance with submittals as specified.
- L. Thermal Transmittance: Provide window units that have a U-value as required by Code rated in BTU/hour/sq. ft./degrees F at 15-mph exterior wind velocity, when tested in accordance with AAMA 1503.1. Test unit to be 4 ft. x 6 ft. Submit proof of compliance with submittals as specified.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 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 glazed aluminum curtain wall systems.
 - 1. Include structural analysis of story drift and deflection from anticipated live loads, and determination whether head receptors are required.
 - 2. Include weatherproofing, drainage and anchorage provisions.
 - 3. Include details, materials, adjacent and adjacent construction. Include isometric views of complex intersections.
- C. Delegated-Design Submittal: For glazed curtain wall system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- E. Fabrication Sample: Of each vertical-to-horizontal intersection of systems, made from 12-inch lengths of full-size components and showing details of the following:
 - 1. Joinery.
 - 2. Anchorage.
 - 3. Expansion provisions.
 - 4. Glazing.
 - Flashing and drainage.
- F. Performance Reports: Based on systems, components and glazing methods proposed for use on this Project, proof that units as glazed for this Project meet or exceed Code requirements for the following:

- 1. U-value.
- 2. Solar heat-gain coefficient.
- G. Compatibility Test Reports: Test reports by glazing and/or sealant manufacturers that show chemical compatibility and adhesion (if required) between all non-aluminum components including, but not limited, to:
 - 1. Gaskets
 - 2. Insulated glass edge seals
 - 3. Setting blocks
 - 4. Anti-walk blocks
 - 5. End dams
 - 6. Sealants
 - 7. Silicone sheet membrane flashing
- H. Welding certificates.
- I. Qualification data for Installer.
- J. Field quality-control test reports.
- K. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the state the 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 glazed curtain wall system that are similar to those indicated for this Project in material, design, and extent.
- C. Installer Qualifications: Capable of assuming engineering responsibility and performing Work of this Section and who is acceptable to manufacturer.
- D. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field-testing, and in-service performance.
- E. Welding: Qualify procedures and personnel according to AWS D1.2, "Structural Welding Code-Aluminum."
- F. Installation Sequence Conference: Conduct conference at Project site to review sequence of installation of curtain wall systems, including installation of joint sealants, flashing, and glass. Conference shall be attended by all installers of applicable components.
- G. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for fabrication and installation.

- 1. Build mockup of typical wall area as indicated on Drawings.
- 2. Build mockup in sequence recommended by manufacturer including installation of joint sealants, flashing and glass.
- 3. The construction of the mockup shall be observed by all tradesmen constructing the curtain wall system.
- H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01. Review methods and procedures related to glazed aluminum curtain wall systems including, but not limited to, the following:
 - 1. Review structural load limitations.
 - 2. Review installation sequence, including installation of sealants, flashing, and glass.
 - 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review required testing, inspecting, and certifying procedures.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of structural supports for glazed aluminum curtain wall systems by field measurements before fabrication and indicate measurements on Shop Drawings.
 - Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating glazed aluminum curtain wall systems without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.7 WARRANTY

- A. Special Assembly Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of glazed aluminum curtain wall systems that do not comply with requirements or that deteriorate as defined in this Section within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Noise or vibration caused by thermal movements.
 - c. Deterioration of metals and other materials beyond normal weathering.
 - d. Water leakage.
 - e. Failure of operating components to function normally.
 - 2. Warranty Period: Three years from date of Substantial Completion.
- B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.
 - 1. Warranty Period: Ten years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Curtain Wall Pressure Plate System:
 - a. EFCO Corporation, System 5600X.
 - b. Kawneer North America, 1600UT System 1.
 - c. Oldcastle BuildingEnvelope, Reliance-TC.
 - d. Wausau, Superwall.
 - e. YKK AP America Inc., YCW-750 XTP.

2.2 FRAMING SYSTEMS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - Sheet and Plate: ASTM B 209
 - 2. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221
 - 3. Extruded Structural Pipe and Tubes: ASTM B 429.
- B. Steel Reinforcement: With manufacturer's standard corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
 - 1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 - 2. Cold-Rolled Sheet and Strip: ASTM A 611.
 - 3. Hot-Rolled Sheet and Strip: ASTM A 570/A 570M.
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- D. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Where fasteners are subject to loosening or turn out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
 - 2. Reinforce members as required to receive fastener threads.
 - 3. Where acceptable, use exposed fasteners with countersunk Phillips screw heads.
 - 4. Finish exposed portions to match framing system.
 - 5. At movement joints, use slip-joint linings, spacers, and sleeves of material and type recommended by manufacturer.
- E. Anchors: Three-way adjustable anchors that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
 - 1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.

- F. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- G. Joint Sealants: Provide manufacturer recommended sealants for seams and joints within aluminum framing system.

2.3 GLAZING SYSTEMS

- A. Glazing: As specified in Section 088000 GLAZING.
- B. Glazing Gaskets: Manufacturer's standard compression types, replaceable, molded or extruded, that maintain uniform pressure and watertight seal.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric types.

2.4 ACCESSORY MATERIALS

- A. Perimeter Fire-Containment Systems (Safing Insulation): Specified in Section 078440 FIRE-RESISTANT JOINT SYSTEMS.
- B. Insulating Materials: Specified in Section 072100 THERMAL INSULATION.
- C. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.
- D. Silicone Membrane: Pre-cured silicone sheet that is physically and chemically compatible with the approved silicone sealant for the curtain wall system.
- E. Foam Tape: Foam glazing tape with adhesive on one side. Select the thickness and width to provide an adequate air and water seal and to provide adequate clamping pressure to silicone flashing.

2.5 FABRICATION

- A. Form aluminum shapes before finishing.
- B. Fabricate components that, when assembled, have the following characteristics:
 - 1. Sharp profiles, straight and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Internal guttering systems or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.
 - 5. Accommodations for thermal and mechanical movements of glazing and framing to prevent glazing-to-glazing contact and to maintain required glazing edge clearances.
- C. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- D. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.6 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- C. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General:

- 1. Comply with manufacturer's written instructions.
- 2. Do not install damaged components.
- 3. Fit joints to produce hairline joints free of burrs and distortion.
- 4. Rigidly secure nonmovement joints.
- 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
- 6. Seal joints watertight, unless otherwise indicated.

B. Connecting and Sealing to Adjacent Enclosure Systems:

- 1. At locations where the curtain wall will be installed adjacent to back vented and drained rain screen wall systems, connect the curtain wall to the water-resistive barrier of the adjacent wall system with silicone membrane flashing.
- 2. Seal and clamp the silicone membrane into the curtain wall glazing pocket.
 - a. Use a sealant that is compatible with the silicone membrane and the silicone in the joints of the curtain wall system.
 - b. Use an L-shaped pressure bar with applied foam tape to clamp the silicone membrane to the curtain wall mullion.
- 3. Notch the stem on vertical mullions as needed to install flashing at the tops and bottoms of the curtain wall. Flashing shall be continuously sealed and clamped into the curtain wall glazing pocket and sealed to adjacent air barrier or enclosure system as indicated on the Drawings. Install similar flashing at the jambs of the curtain wall to provide continuous perimeter flashing.
- 4. At locations where the curtain wall will be installed adjacent to roofing systems connect the curtain wall to the roofing vapor barrier and the roof membrane. The roofing vapor barrier may be adhered directly to the inboard side of the curtain wall. Provide a metal

backpan if needed to allow for this connection. Connect the roofing membrane to the curtain wall by transitioning the roof membrane to a silicone sheet membrane.

- a. Provide stainless steel sheet or foil-faced membrane as needed to transition between the roofing membrane and the silicone sheet.
- b. Seal and clamp the silicone sheet into the curtain wall as described above.

C. Metal Protection:

- 1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.
- 2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- D. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
- E. Install components plumb and true in alignment with established lines and grades.
- F. Coordinate with glazing and installation of glazing which is specified in Section 088000 GLAZING.
- G. Coordinate with sealants and installation of perimeter sealants which is specified in Section 079200 JOINT SEALANTS.
- H. Coordinate with insulation and installation of insulation which is specified in Section 072100 THERMAL INSULATION.
- I. Coordinate with materials and installation for perimeter fire-containment systems (safing insulation) which is specified in Section 078440 FIRE-RESISTIVE JOINT SYSTEMS.
- J. Erection Tolerances: Install glazed aluminum curtain wall systems to comply with the following maximum tolerances:
 - 1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
 - 2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
 - Alignment:
 - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
 - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
 - c. Where surfaces are separated by reveal or protruding element of 1 inch wide or greater, limit offset from true alignment to 1/4 inch.
 - 4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

- B. Testing Services: Testing and inspecting of representative areas to determine compliance of installed system with specified requirements shall take place as follows and in successive stages as indicated on Drawings. Do not proceed with installation of the next area until test results for previously completed areas show compliance with requirements.
 - 1. Air Infiltration: Areas shall be tested for air leakage of 1.5 times the rate specified under Part 1 "Performance Requirements" Article, but not more than 0.09 cfm/sq. ft. of fixed wall area when tested according to ASTM E 783 at a minimum static-air-pressure differential of 6.24 lbf/sq. ft.
 - 2. Water Penetration: Areas shall be tested according to ASTM E 1105 at minimum cyclic static-air-pressure difference of 0.67 times the pressure specified under Part 1 "Performance Requirements" Article, but not less than 6.24 lbf/sq. ft. and shall not evidence water penetration.
 - 3. Water Spray Test: After the installation of minimum area of 75-feet-by-2-story glazed aluminum curtain wall system has been completed but before installation of interior finishes has begun, a 2-bay area of system designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
- C. Repair or remove work where test results and inspections indicate that it does not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

END OF SECTION

SECTION 085110 - ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Fixed and operable aluminum-framed windows with factory-installed glass and glazing.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - Section 084110 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS.
 - 2. Section 088000 GLAZING for requirements for glass and glazing.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide aluminum windows capable of complying with performance requirements indicated, based on testing manufacturer's windows that are representative of those specified and that are of test size indicated below:
 - 1. Minimum size required by AAMA/NWWDA 101/I.S.2.
- B. AAMA/NWWDA Performance Requirements: Provide aluminum windows of the performance class and grade indicated that comply with AAMA/NWWDA 101/I.S.2.
 - 1. Performance Class: Architectural Grade AW.
 - 2. Performance Grade: Minimum for performance class indicated.
 - 3. Exception to AAMA/NWWDA 101/İ.S.2: In addition to requirements for performance class and performance grade, design glass framing system to limit lateral deflections of glass edges to less than 1/175 of glass-edge length or 3/4 inch whichever is less, at design pressure based on the following:
- C. Structural Performance: Provide aluminum windows capable of withstanding the following, including wind loads based on passing AAMA/NWWDA 101/I.S.2, Uniform Load Structural Test, at basic wind speed indicated and as required by Code:
 - 1. Deflection: Design glass framing system to limit lateral deflections of glass edges to less than 1/175 of glass-edge length or 3/4 inch, whichever is less, at design pressure based on structural computations.
 - 2. Wind and Seismic Loads: As indicated on the Structural Drawings, but not less than that required by Code.

- 3. Movements of supporting structure including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads as required by Code. Deflection may require special considerations including but not limited to head receptors.
- D. Air Infiltration: Maximum rate not more than indicated when tested according to AAMA/NWWDA 101/I.S.2, Air Infiltration Test.
 - 1. Maximum Rate: As required by Code.
- E. Water Resistance: No water leakage as defined in AAMA/NWWDA referenced test methods at a water test pressure equaling that indicated, when tested according to AAMA/NWWDA 101/I.S.2, Water Resistance Test.
 - 1. Test Pressure: 15 percent of positive design pressure, but not less than 2.86 lbf/sq. ft. or more than 12 lbf/sq. ft.
- F. Condensation-Resistance Factor: Provide aluminum windows tested for thermal performance according to AAMA 1503, showing a CRF of 52 where windows are indicated to be "thermally improved."
- G. Thermal Transmittance: Provide aluminum windows with a whole-window U-value maximum indicated at 15-mph exterior wind velocity and winter condition temperatures when tested according to AAMA 1503.
 - 1. U-Value: As required by Code. Submit proof of compliance with submittals as specified.
- H. Solar Heat-Gain Coefficient: Provide aluminum windows with a whole-window SHGC maximum as required by Code, determined according to NFRC 200 procedures. Submit proof of compliance with submittals as specified.
- I. Thermal Movements: Provide aluminum windows, including anchorage, that accommodate thermal movements of units resulting from the following maximum change (range) in ambient and surface temperatures without buckling, distortion, opening of joints, failure of joint sealants, damaging loads and stresses on glazing and connections, and other detrimental effects. Base engineering calculation on actual surface temperatures of materials due to solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F material surfaces.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Include construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, finishes, and operating instructions.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other Work, operational clearances, and the following:
 - 1. Mullion details, including reinforcement and stiffeners.
 - 2. Joinery details.
 - 3. Expansion provisions.
 - 4. Flashing and drainage details.

- 5. Weather-stripping details.
- 6. Thermal-break details.
- 7. Glazing details.
- 8. Window cleaning provisions.
- 9. Window System Operators: Show locations, mounting, and details for installing operator components and controls.
- 10. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation and used to determine the following:
 - a. Structural test pressures and design pressures from basic wind speeds indicated.
 - b. Deflection limitations of glass framing systems.
- C. Samples for Verification: Full-size operable window of each type of window.
- D. Qualification Data: For Installer, professional engineer and testing agency.
- E. Field Quality-Control Test Reports: From a qualified testing and inspecting agency engaged by Contractor.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed within the last four years by a qualified testing agency, for each type, grade, and size of aluminum window. Test results based on use of downsized test units will not be accepted.
- G. Performance Reports: Based on systems, components and glazing methods proposed for use on this Project, proof that windows as glazed for this Project meet or exceed Code requirements for the following:
 - 1. U-value.
 - 2. Solar heat-gain coefficient.
- H. Maintenance Data: For operable window sash, operating hardware, weather stripping, and finishes to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An installer acceptable to aluminum window manufacturer for installation of units required for this Project.
- B. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- C. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the state the 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 windows that are similar to those indicated for this Project in material, design, and extent.
- D. Source Limitations: Obtain aluminum windows through one source from a single manufacturer.
- E. Product Options: Information on Drawings and in Specifications establishes requirements for aluminum windows' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance

characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.

- F. Fenestration Standard: Comply with AAMA/NWWDA 101/I.S.2, "Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors," for minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
 - 1. Provide AAMA certified aluminum windows with an attached label.
- G. Glazing Publications: Comply with published recommendations of glass manufacturers and GANA's "Glazing Manual" unless more stringent requirements are indicated.
- H. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockup for types of windows indicated, in locations shown on Drawings.
- I. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01. Review methods and procedures related to aluminum windows including, but not limited to, the following:
 - Inspect and discuss condition of substrate and other preparatory work performed by other trades.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review required testing and inspecting procedures.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify aluminum window openings by field measurements before fabrication and indicate measurements on Shop Drawings.
 - Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening dimensions and proceed with fabricating aluminum windows without field measurements. Coordinate wall construction to ensure that actual opening dimensions correspond to established dimensions.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
 - 1. Failure to meet performance requirements.
 - 2. Structural failures including excessive deflection.
 - 3. Water leakage, air infiltration, or condensation.
 - 4. Faulty operation of movable sash and hardware.
 - 5. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 6. Insulating glass failure.
- B. Warranty Period: Ten years from date of Substantial Completion.

- C. Warranty Period for Metal Finishes: Ten years from date of Substantial Completion.
- D. Warranty Period for Glass: Ten years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. EFCO, a Pella Company.
 - 2. Graham Architectural Products Corp.
 - 3. Kawneer North America.
 - 4. Peerless Products, Inc.
 - 5. Wausau Window and Wall Systems.
- B. Types: Provide types in locations indicated on Drawings:

2.2 MATERIALS

- A. Aluminum Extrusions: Alloy and temper recommended by aluminum window manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi (150-MPa) ultimate tensile strength, not less than 16,000-psi (110-MPa) minimum yield strength, and not less than 0.062-inch (1.6-mm) thickness at any location for the main frame and sash members.
- B. Fasteners: Aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by manufacturer to be noncorrosive and compatible with aluminum window members, trim, hardware, anchors, and other components.
 - 1. Reinforcement: Where fasteners screw anchor into aluminum less than 0.125 inch (3.2 mm) thick, reinforce interior with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard, noncorrosive, pressed-in, splined grommet nuts.
 - 2. Exposed Fasteners: Unless unavoidable for applying hardware, do not use exposed fasteners. For application of hardware, use fasteners that match finish of member or hardware being fastened, as appropriate.
- C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- E. Compression-Type Weather Stripping, typical: Provide compressible weather stripping designed for permanently resilient sealing under bumper or wiper action and for complete concealment when aluminum window is closed.

- F. Sliding-Type Weather Stripping for Double-Hung and Horizontal-Sliding Windows: Provide woven-pile weather stripping of wool, polypropylene, or nylon pile and resin-impregnated backing fabric. Comply with AAMA 701/702.
 - 1. Weather Seals: Provide weather stripping with integral barrier fin or fins of semirigid, polypropylene sheet or polypropylene-coated material. Comply with AAMA 701/702.
- G. Replaceable Weather Seals: Comply with AAMA 701/702.
- H. Sealant: For sealants required within fabricated windows, provide window manufacturer's standard, permanently elastic, nonshrinking, and nonmigrating type recommended by sealant manufacturer for joint size and movement.

2.3 GLAZING

- A. Insulating-Glass Units for Vertical Glazing: 1 inch thick (25.0 mm) insulating glass consisting of two lites of 1/4 inch (6 mm) glass, low e coating on the No. 2 surface and argon gas filled. Provide one of the following or equal:
 - 1. Guardian Industries; SN-68.
 - a. Visible Light Transmittance: 68 percent.
 - b. Reflectance Visible Light: 10 percent.
 - c. U Value (Winter): 0.29.
 - d. Shading Coefficient: 0.43.
 - e. Solar Heat Gain Coefficient: 0.37.
 - 2. Viracon; VE1-2M.
 - a. Visible Light Transmittance: 70 percent.
 - b. Reflectance Visible Light: 11 percent.
 - c. U Value (Winter): 0.25.
 - d. Shading Coefficient: 0.43.
 - e. Solar Heat Gain Coefficient: 0.37.
 - 3. Vitro Architectural Glass (formerly PPG Industries); Solarban 60.
 - a. Visible Light Transmittance: 70 percent.
 - b. Reflectance Visible Light: 11 percent.
 - c. U Value (Winter): 0.29.
 - d. Shading Coefficient: 0.44.
 - e. Solar Heat Gain Coefficient: 0.38.
- B. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.

2.4 HARDWARE

- A. Hardware Requirements: Provide hardware that complies with AAMA/NWWDA 101/I.S.2.
 - 1. Hardware Finishes: To be selected by Architect from manufacturer's full range.
- B. Casement Window Hardware:

- Gear-Type Rotary Operators: Complying with AAMA 901 when tested according to ASTM E405, Method A. Provide operators that function without requiring the removal of interior screens or using screen wickets.
 - a. Type and Style: Match Architect's sample.
- 2. Hinges: Non-friction type, not less than two per sash.

2.5 LOCK: LIFT TYPE OR LEVER HANDLE, AS SELECTED BY ARCHITECT. INSECT SCREENS

- A. General: Design windows and hardware to accommodate screens in a tight-fitting, removable arrangement, with a minimum of exposed fasteners and latches. Provide for each operable exterior sash or ventilator.
- B. Aluminum Insect Screen Frames: Manufacturer's standard aluminum alloy complying with SMA 1004. Fabricate frames with mitered or coped joints, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.
 - 1. Aluminum Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet with minimum wall thickness as required for class indicated.
 - 2. Finish: Match aluminum window members.
- C. Stainless-Steel Wire Fabric: 18-by-16 mesh of 0.009-inch-diameter, nonmagnetic stainless-steel wire, Type 304 or 316, complying with FS RR-W-365, Type VI.
- D. Wickets: Not permitted.

2.6 FABRICATION

- A. General: Fabricate aluminum windows, in sizes indicated, that comply with AAMA/NWWDA 101/I.S.2 for performance class and performance grade indicated. Include a complete system for assembling components and anchoring windows.
- B. Thermally Improved Construction: Fabricate aluminum windows with an integral, concealed, low-conductance thermal barrier; located between exterior materials and window members exposed on interior side; in a manner that eliminates direct metal-to-metal contact.
- Weather Stripping: Provide full-perimeter weather stripping for each operable sash and ventilator.
- D. Weep Holes: Provide concealed weep holes and internal passages to conduct infiltrating water to exterior.
- E. Mullions: Provide mullions and cover plates as shown, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units.
- F. Factory-Glazed Fabrication: Glaze aluminum windows in the factory where practical and possible for applications indicated. Comply with AAMA/NWWDA 101/I.S.2.

2.7 FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- C. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances; rough opening dimensions; levelness of sill plate; coordination with wall flashings, vapor retarders, and other built-in components; operational clearances; and other conditions affecting performance of work.
 - 1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris
 - 2. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components; Drawings; and Shop Drawings.
- B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill members in bed of sealant or with gaskets, as indicated, for weathertight construction.
- D. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.
- E. Metal Protection: Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified in "Dissimilar Materials" Paragraph in Appendix B in AAMA/NWWDA 101/I.S.2.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.
- B. Testing Services: Testing and inspecting of installed windows shall take place as follows:

- 1. Testing Methodology: Testing of windows for air infiltration and water resistance shall be performed according to AAMA 502.
- 2. Air-Infiltration Testing:
 - a. Test Pressure: That required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance class indicated.
 - b. Allowable Air-Leakage Rate: 1.5 times the applicable AAMA/WDMA/CSA 101/I.S.2/A440 rate for product type and performance class rounded down to one decimal place.
- 3. Water-Resistance Testing:
 - a. Test Pressure: Two-thirds times test pressure required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance grade indicated.
 - b. Allowable Water Infiltration: No water penetration.
- 4. Testing Extent: Three windows of each type as selected by Architect and a qualified independent testing and inspecting agency. Windows shall be tested after perimeter sealants have cured.
- 5. Test Reports: Prepared according to AAMA 502.
- C. Remove and replace windows where test results indicate that they do not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.4 ADJUSTING

A. Adjust operating sashes and ventilators, screens, hardware, operators, and accessories for a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.

3.5 PROTECTION AND CLEANING

- A. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.
- B. Clean aluminum surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- C. Clean factory-glazed glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels and clean surfaces.
- D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION

SECTION 085610 - TRANSACTION WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sliding transaction windows, fire-rated.

1.2 COORDINATION

A. Coordinate installation of anchorages for transaction windows. 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 adjacent construction. Deliver such items to Project site in time for installation.

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 window units.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
 - 3. Include description of automatic closing device and testing and resetting instructions.
- B. Shop Drawings: For transaction windows.
 - 1. Include plans, elevations, sections, and attachments to other work.
 - 2. Full-size section details of framing members, including internal armoring, reinforcement, and stiffeners.
 - 3. Glazing details.
 - 4. Keying information
 - 5. Wiring diagrams.
- C. Samples for Initial Selection: Of manufacturer's available colors for powder paint finish.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
- B. Operation and Maintenance Data: For sliding metal fire doors to include in emergency, operation, and maintenance manuals

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Pack transaction windows in wood crates for shipment.
- B. Label transaction window packaging with drawing designation.
- C. Store crated transaction windows on raised blocks to prevent moisture damage.

PART 2 - PRODUCTS

2.1 PERFORMANCE CRITERIA

- A. Horizontal sliding steel windows shall conform to the HS-C30 voluntary specifications in AAMA/NWWDA 101/I.S.2-97 and be designed to meet the performance requirements listed herein. Fire-rated windows shall bear the Underwriters Laboratories, Inc. label including the manufacturer's file number for the indicated rating.
- B. Fire Resistance: Fire resistance shall meet requirements established by ASTM E 163 and as tested and classified by Underwriters Laboratories Inc, in accordance with UL-9. Products shall meet the requirements of Underwriters Laboratories Inc. The Listing Mark of UL on the product will be accepted as evidence of compliance.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 SLIDING TRANSACTION WINDOWS

- A. Basis of Design Product: "Series 900 Horizontal Sliding Windows" manufactured by D.V. Fyre-Tec, Inc.; or approved equal.
- B. Horizontal sliding steel windows shall be designed for inside field glazing, and for glass types specified. Units shall be complete with glass and glazing.
- C. Fire-Rated Glazing Material (Laminated Ceramic Glazing Material): Provide Firelite Plus Premium by Nippon Electric Glass Co., Ltd., and distributed by Technical Glass Products as specified in Section 088000. Glass fire rating shall meet opening rating requirements.
- D. Fire-rated windows shall conform to UL-9 and shall be labeled with a 1- hour fire-test rating as specified in the window schedule. Units shall be designed and fabricated to meet glass sizes, window sizes, and opening dimensions established by NFPA 80. Hardware shall conform to NFPA 80 requirements. Operable fire-rated windows shall be self-closing and positive latching and equipped with the following operator:
 - 1. Operator shall be electric employing the "McCabe Link, Model E5720H" with a release time of a maximum of one (1) minute. Automatic closure device shall be

activated by heat rise, or by a fire or smoke alarm, computer or other electrical signal. 24 or 110 volt actuation signal required; refer to electrical drawings for requirements.

2.3 FABRICATION

- A. General: Fabricate transaction windows to provide a complete system for assembly of components and anchorage of window units.
 - 1. Provide factory preglazed transaction windows.
- B. Framing: Miter or cope corners the full depth of framing; weld and dress smooth.
- C. Steel frames and inserts shall be fabricated from roll-formed galvanized lock-forming quality steel per ASTM A 653.
- D. Operable insert/sash shall be supported on two field adjustable roller trucks consisting of corrosion resisting steel with integral ball bearing rollers. Rollers shall be supported and operate on a stainless steel track.
- E. Glazing Stops: Finish glazing stops to match transaction window framing.
- F. Welding: Weld components to comply with referenced AWS standard. To greatest extent possible, weld before finishing and in concealed locations to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

2.4 ACCESSORIES

- A. Anchors, Fasteners, Clips, and Window Accessories: Stainless steel; hot-dip, zinc-coated steel or iron, complying with ASTM B 633.
- B. Sealants: For sealants required within fabricated transaction windows, provide type recommended by manufacturer for joint size and movement. Sealant shall remain permanently elastic, nonshrinking, and nonmigrating.

2.5 STEEL FINISH

A. Provide powder coat painted finish, manufacturer's standard system, in color selected by Architect.

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 transaction windows.

- B. Examine in-place construction for compliance with manufacturer's installation requirements before transaction window installation.
- C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of transaction windows.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing transaction windows to in-place construction. Include threaded fasteners for inserts, security fasteners, and other connectors.
- B. Fasteners: Install transaction windows using fasteners recommended by manufacturer with head style appropriate for installation requirements, strength, and finish of adjacent materials. Provide stainless-steel fasteners.
- C. Sealants: Comply with requirements in Section 079200 "Joint Sealants" for installing sealants, fillers, and gaskets.

3.3 ADJUSTING

- A. Remove and replace defective work, including transaction windows that are warped, bowed, or otherwise unacceptable.
- B. Adjust for smooth operation of sliding windows

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Test release, closing, and alarm operations when activated by smoke detector or building's fire-alarm system. Test manual operation of window. Reset automatic-closing mechanism after successful test.
- B. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

3.5 CLEANING AND PROTECTION

- A. Clean surfaces promptly after installation of transaction windows. Take care to avoid damaging the finish. Remove excess glazing and sealant compounds, dirt, and other substances.
- B. Clean glass of preglazed transaction windows promptly after installation.

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C. Provide temporary protection to ensure that transaction windows are without damage at time of Substantial Completion.

END OF SECTION 085610

SECTION 086200 - PLASTIC UNIT SKYLIGHTS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Prefabricated, plastic unit skylights at roof.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Division 07 for roofing and joint sealants.
 - 2. Section 075300 EPDM MEMBRANE ROOFING for roof flashing.
 - 3. Section 079200 JOINT SEALANTS for perimeter joint sealants.

1.3 SUBMITTALS

- A. Product Data: Submit complete manufacturer's product data to Architect for approval, consisting of complete product description and specifications, complete test data and technical characteristics, installation instructions, complete maintenance instructions, and other pertinent technical data required for complete product and product use information.
- B. Shop Drawings: Submit complete shop drawings of all work of this Section to Architect for approval, showing large scale details of construction and methods of installation and anchorage, including types, sizes, thicknesses, shapes, and finishes of all materials; anchorage; closures; flashings; sealing; and relationship to surrounding work by other trades. Sufficient typical and special conditions shall be shown to fully establish the design, quality, character, and weathertight integrity of the proposed installation.

1.4 QUALITY ASSURANCE

- A. The manufacturer shall be responsible for the configuration, fabrication, and performance of the unit skylights, in general conformance with the Contract Documents.
- B. The manufacturer shall be able to identify at least five projects in the regional area where unit skylights of similar type and size have been installed and have performed satisfactorily since their installation, for a period of at least the last ten consecutive years.

1.5 TESTS AND PERFORMANCE REQUIREMENTS

- A. Manufacturer's Standard Tests: Provide manufacturer's standard test data showing compliance with code requirements. Provide specified tests if manufacturer's standard skylight units have been modified, or when custom skylights are used.
- B. Skylight system shall be designed for design loads for snow, wind, etc., established by the governing laws and the applicable building code, with a maximum deflection of L/175 of the unsupported span of any member, and without cracking or breakage of glazing material, permanent deformation of any member, exceeding of the ultimate tensile strength of any member, or failure of any fastening or anchor.
 - 1. Plastic unit skylights shall not transmit any horizontal loads to structure.

1.6 COORDINATION

- A. Coordinate work of this Section with work of other trades affecting, or affected by, this work to assure the steady progress of all the work of the Contract.
- B. Before proceeding with installation work inspect all project conditions and all work of other trades to assure that all such conditions and work are suitable to satisfactorily receive the work of this Section, and notify the Architect in writing of any which are not. Do not proceed further until corrective work has been completed or waived.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Package and deliver all materials, and store and handle in such manner, as to assure complete protection of all materials from damage.
- B. Store skylights several inches above the ground, blocked and under cover to prevent warping. Clean all aluminum and panels before installation, and maintain all joint surfaces thoroughly clean until sealants are applied.

1.8 WARRANTY

- A. Include written warranty, signed by manufacturer, installer and Contractor, covering defects of materials and workmanship for a period of ten years from the date of Substantial Completion of Project.
- B. Include manufacturer's standard written warranty covering defects of insulating skylight for a period of ten years against breakage, delamination, or seal failure.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Bristolite Skylights. Coollite ALT-SF-2.
 - 2. Wasco, EcoSkv3.
 - 3. Approved equal.

2.2 SKYLIGHTS

A. Factory-Fabricated Skylights:

- 1. Sizes: As indicated on the Drawings.
- 2. Aluminum members shall be extruded 6063 aluminum conforming to ASTM B 221, with a minimum thickness of 0.094 in.
- 3. Cap fasteners shall be 1/4 in. diameter stainless steel with stainless steel and neo-prene sealing washers, spaced a maximum of 12 in. o.c.
- 4. Internal fasteners shall be stainless steel.
- 5. Glazing seal shall be butyl sealant tape to allow for thermal movement of acrylic glaz-ing.
- Acrylic shall be double glazed type, clear and translucent as selected by Architect.
 Outside acrylic panel shall be high impact type to withstand 200 lb. load as required by OSHA
- 7. Glazing Performance Requirements: Comply with minimum requirements of ASHRAE 90.1-2004, and as follows:
 - a. U-value: 0.45 minimum.
 - b. Solar Heat Gain Coefficient (SHGC): 0.34 maximum.
 - c. Visible Light Transmission (VLT): 43%, minimum.
 - d. VLT/SHGC: 1.25 or better.
- 8. Curb: Self-flashing curb, 12 in. high.
- 9. Finish: Finish shall be selected by Architect from manufacturer's standard finishes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Plastic unit skylights shall be installed in strict accordance with the approved shop drawings and the manufacturer's printed installation instructions by the skylight manufacturer utilizing his own fully experienced, adequately supervised, erection crews. Installation shall be complete in all respects, including all framing and all related aluminum closures, flashings, fillers, fastenings, anchors, sealing, required for a complete weathertight installation, including sealing between the skylight system components and the surrounding construction.
- B. Provide positive and adequate fastening and anchorage of all components, including fastening into existing construction. Work shall not void the warranty provisions of existing roof construction.
- C. Contact surfaces between aluminum and dissimilar materials shall be protected with coating of bituminous mastic or application of nonabsorptive, dielectric tape for prevention of electrolytic action and corrosion. Do not use bituminous mastic where it might contaminate a joint or surface to receive sealant.

3.3 SEALING

A. Do all metal-to-metal sealing required to assure thoroughly weathertight installations throughout, as recommended by sealant manufacturer and conforming to the general procedures specified under Section 079200 - JOINT SEALANTS.

3.4 PROTECTION AND CLEANING OF ALUMINUM

- A. Protect finished metal surfaces from damage during fabrication, shipping, storage, and erection, and from then until acceptance by Owner.
- B. Clean all metal and glazing surfaces promptly after installation. Remove excess sealant, dirt, and other substances.

3.5 PROTECTION AND CLEANING OF GLAZING

- A. Replace all glazing which is broken, cracked, or chipped prior to time of final acceptance of Project by Owner.
- B. Clean glazing surfaces promptly after installation, exercising care to avoid damage to same.

END OF SECTION

SECTION 087100 - DOOR HARDWARE

NOTE: Portions of the Door Hardware for this Project shall be provided by the Owner and installed by the General Contractor. General Contractor shall include work for coordination with the Owner, required logistics, handling and storage of Owner supplied materials, and all required submittals listed within this section. Door hardware schedule included in this section shall be utilized by the General Contractor for reference and coordination purposes. General Contractor shall coordinate as required with new and existing door and frame assemblies. See Section 011000 Summary of Work for additional information.

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 commercial door hardware for the following:
 - 1. Swinging doors.
 - 2. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Electromechanical door hardware.
 - 3. Cylinders specified for doors in other sections.

C. Related Sections:

- 1. Division 08 Section "Hollow Metal Doors and Frames".
- 2. Division 08 Section "Flush Wood Doors".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC International Building Code.
 - 3. NFPA 70 National Electrical Code.
 - 4. NFPA 80 Fire Doors and Windows.
 - 5. NFPA 101 Life Safety Code.
 - 6. NFPA 105 Installation of Smoke Door Assemblies.
 - 7. State Building Codes, Local Amendments.

- E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:
 - 1. ANSI/BHMA Certified Product Standards A156 Series.
 - 2. UL10C Positive Pressure Fire Tests of Door Assemblies.
 - 3. ANSI/UL 294 Access Control System Units.
 - 4. UL 305 Panic Hardware.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 - 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.
 - 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Shop Drawings: Details of electrified access control hardware indicating the following:
 - 1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access

control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

- a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
- b. Complete (risers, point-to-point) access control system block wiring diagrams.
- c. Wiring instructions for each electronic component scheduled herein.
- 2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.
- D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

- 1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).
- C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- E. Access Control Manufacturers Qualifications: Engage qualified manufacturers with a minimum of five (5) years of documented experience in providing access control and security systems

equipment and software similar to that indicated for this Project and that have a proven record of successful in-service performance.

- 1. Software and access control systems components to have been previously and thoroughly tested together with proven installations similar in size and functionality to the design requirements indicated for this Project.
- F. System Integrator Qualifications: Systems Integrators, verifiably factory trained and certified by the primary product manufacturers, with a minimum of three (3) years documented experience installing complete integrated access control systems similar in material, design, and scope to that indicated for this Project and whose work has resulted in construction with a proven record of successful in-service performance.
- G. Installer Qualifications: Certified technicians, verifiably authorized with the primary product manufacturers for installation of IP-Enabled, Wireless, and Power-over-Ethernet Access Control products in accordance with documented instructions and NFPA 80.
 - 1. ASSA ABLOY access control products are required to be installed only through designated "Preferred Installers."
- H. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
 - 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
 - 2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.
- I. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- J. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.
- K. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
 - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.

- 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
- 3. Review sequence of operation narratives for each unique access controlled opening.
- 4. Review and finalize construction schedule and verify availability of materials.
- 5. Review the required inspecting, testing, commissioning, and demonstration procedures
- L. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
- C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

- 1. Structural failures including excessive deflection, cracking, or breakage.
- 2. Faulty operation of the hardware.
- 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- 4. Electrical component defects and failures within the systems operation.
- C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

- 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" heavy weight.
- 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
- 4. Hinge Options: Comply with the following:
 - a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
- Manufacturers:
 - a. McKinney (MK) TA/T4A Series, 5 knuckle.

2.3 POWER TRANSFER DEVICES

- A. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
 - 1. Manufacturers:
 - a. Securitron (SU) EL-CEPT Series.
- B. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to throughdoor wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.
 - 1. Provide one each of the following tools as part of the base bid contract:
 - a. McKinney (MK) Electrical Connecting Kit: QC-R001.
 - b. McKinney (MK) Connector Hand Tool: QC-R003.

Manufacturers:

a. McKinney (MK) - QC-C Series.

2.4 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.
 - 1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
 - 2. Furnish dust proof strikes for bottom bolts.
 - 3. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
 - 4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
 - 5. Manufacturers:
 - a. Rockwood (RO).
- B. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
 - 1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
 - 2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
 - 3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
 - 4. Pulls, where applicable, shall be provided with a 10" clearance from the finished floor on the push side to accommodate wheelchair accessibility.
 - 5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
 - 6. Manufacturers:
 - a. Rockwood (RO).

2.5 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
 - 1. Manufacturers:
 - a. Sargent Manufacturing (SA).
- B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

- 1. Threaded mortise cylinders with rings and cams to suit hardware application.
- 2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
- 3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
- 4. Tubular deadlocks and other auxiliary locks.
- 5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
- 6. Keyway: Match Facility Standard.
- C. Keying System: Each type of lock and cylinders to be factory keyed.
 - 1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
 - 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 - 3. Existing System: Key cylinders to match Owner's existing system.
 - 4. Registry # 70510430 for Orange Ulster; 6-Pin; RN keyway; SKD's RE keyway.
- D. Key Quantity: Provide the following minimum number of keys:
 - 1. Change Keys per Cylinder: Two (2)
 - 2. Master Keys (per Master Key Level/Group): Five (5).
 - 3. Construction Keys (where required): Ten (10).
- E. Construction Keying: Provide construction master keyed cylinders.
- F. Key Registration List (Bitting List):
 - 1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
 - 2. Provide transcript list in writing or electronic file as directed by the Owner.

2.6 KEY CONTROL

- A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.
 - 1. Manufacturers:
 - a. Lund Equipment (LU).
 - b. MMF Industries (MM).
 - c. Telkee (TK).

2.7 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed.
 - 1. Locks shall meet or exceed the requirements of ANSI/BHMA A156.2 Series 4000, Grade 1 with all standard trims, as follows:

- a. Cycle Test: ANSI/BHMA A156.2 Grade 1 requirements with no lever sag.
- b. Abusive Locked Lever Torque: Exceed 3,100 in-lb with no entry; lock to maintain egress functionality in compliance with BHMA certification requirements.
- c. Offset Lever Pull: Exceed 1,600 lbs with no entry (8 times ANSI/BHMA A156.2 requirements).
- d. Latch Retraction with Preload: Exceed 100 lb preload while maintaining ANSI/BHMA requirements for operation in warped doors (2 times ANSI/BHMA A156.2 requirements).
- 2. Vertical Impact: Exceed 100 vertical impacts (20 times ANSI/BHMA A156.2 requirements).
- 3. Furnish with solid cast levers, standard 2 3/4" backset, and 1/2" (3/4" at paired openings) throw brass or stainless steel latchbolt.
- 4. Locks are to be non-handed and fully field reversible.
- 5. Manufacturers:
 - a. Sargent Manufacturing (SA) 10X Line.

2.8 APERIO WIRELESS ACCESS CONTROL

- A. Wireless Access Control Cylindrical Locks: Wireless technology ANSI/BHMA A156.2 Series 4000 Grade 1 cylindrical lockset with integrated card reader and request-to-exit signaling in one complete unit. Separate DPS connects directly to lock electronics for door position (open/closed status) monitoring. Motor driven locking/unlocking control of the lever handle trim with 1/2" deadlocking stainless steel latch. Lock is U.L listed and labeled for use on up to 3 hour fire rated openings.
 - Wireless access control cylindrical locks interface using local wireless connection between the lock unit and a nearby communication hub. Communication hub connected via RS-485 or Wiegand to a new or existing online electronic access control system platform.
 - Fully-encrypted AES 128 wireless communication between lock and communication hub (IEEE 802.15.4, 2.4 GHz) with no proprietary programming device requirements. Locks will continue functional operation independent of wireless connection slowdown or failure.
 - 3. Integrated reader supports HID® 125kHz proximity credentials; or ISO 14443 A/B and ISO 15693 13.56 MHz contactless credentials: HID® iCLASS/iCLASS SE (full authentication, all formats), MIFARE Classic, DESFire EV1 (full authentication, all formats); or Near Field Communications (NFC); or HID® SIO enabled.
 - 4. Support for HID Mobile Access via Bluetooth Low Energy (BLE) short-range wireless communication.
 - 5. Power Source: 6 AA alkaline batteries power supply with LED indication of locked, programming mode and low capacity warning status conditions.
 - 6. Outside lever rigid except when valid user code is entered. Emergency override access capability with optional mechanical key cylinder retraction of lock latch bolt without necessary electronic activation.
 - 7. Communication Hub: Provide the necessary number of hubs which is connected to the access control system via RS-485 or Wiegand as required by the system. Provide hubs factory paired with the locks, but allow for field configuration as needed.

- 8. Complete installation to include manufacturer's Installation Tool and USB Radio Dongle for initial lock set-up and configuration. Electronic on-line access control system platform, including communication cabling and software, by others.
- 9. Manufacturers:
 - a. Sargent Manufacturing (SA) IN100 10 Line Series.
- B. Wireless Access Control Exit Hardware: Wireless technology ANSI/BHMA A156.3 Grade 1 rim and mortise exit device hardware with integrated card reader. Separate DPS connects directly to exit hardware electronics for door position (open/closed status) monitoring. Motor driven locking/unlocking control of the lever handle exit trim with 3/4" throw latch bolt. U.L listed and labeled for either panic or "fire exit hardware" for use on up to 3 hour fire rated openings. Available with or without keyed high security cylinder override trim.
 - Wireless access control exit hardware interfaces using local wireless connection between the electronic exit trim and a communication hub located directly above the door. Communication hub connected via RS-485 to a new or existing online electronic access control system platform.
 - 2. Fully-encrypted AES 128 wireless communication between lock and communication hub (IEEE 802.15.4, 2.4 GHz) with no proprietary programming device requirements. Locks will continue functional operation independent of wireless connection slowdown or failure.
 - 3. Integrated card reader supports 125kHz proximity credentials; 13.56 MHz contactless credentials: HID® iCLASS (full authentication, all formats, including SEOS), Mifare Classic (Sector and UID), DESFire, NFC-enabled mobile phones.
 - 4. Support for HID Mobile Access via Bluetooth Low Energy (BLE) short-range wireless communication.
 - 5. Lockdown capability with maximum 10 second response.
 - 6. Patent pending credential cache to ensure offline access.
 - 7. Power Source: 6 AA alkaline batteries power supply with LED indication of locked, programming mode and low capacity warning status conditions.
 - 8. Outside lever rigid except when in "passage" mode, or valid user code is entered. Emergency override access capability with optional mechanical key cylinder retraction of exit device latch without necessary electronic activation.
 - 9. Complete installation to include manufacturer's Installation Tool and USB Radio Dongle for initial lock set-up and configuration. Electronic on-line access control system platform, including communication cabling and software, by others.
 - 10. Manufacturers:
 - a. Sargent Manufacturing (SA) IN100 80 Series.

2.9 INTEGRATED WIRED OUTPUT LOCKING DEVICES - MULTI-CLASS READER

- A. Integrated Wired Output Multi-Class Cylindrical Locks: Wiegand or Open Supervised Device Protocol (OSDP) output ANSI A156.2, Grade 1, Cylindrical Lockset with integrated card reader with or without keypad option, and request-to-exit signaling in one complete unit. Hard wired, solenoid driven locking/unlocking control of the lever handle trim with 1/2" deadlocking stainless steel latch. Lock is U.L listed and labeled for use on up to 3 hour fire rated openings.
 - 1. Open architecture, hard wired platform supports centralized control of locking units with new or existing Wiegand or OSDP compatible access control systems. Inside lever

handle (request-to-exit) signaling standard with door position (open/closed status) monitoring (via separately connected DPS).

- 2. Integrated reader supports the following credentials:
 - a. 125kHz proximity credentials: HID, AWID, Indala, and EM4102.
 - b. 13.56 MHz proximity credentials: HID Secure Identity Object™ (SIO) on iCLASS Seos, HID iCLASS, HID iCLASS SE/SR, MIFARE Classic, DESFire EV1 and EV2.
 - c. 2.4 GHz credentials: Secure Identity Object™ (SIO) on Mobile IDs (Bluetooth Smart)
 - d. ISO14443A/B (PIV-compatible Transparent FASC-N read) available with pivCLASS variant
 - e. NFC-enabled mobile phones
 - f. PIN code only or PIN + credential with keypad option
- 3. 12VDC external power supply required for reader and lock, with optional 24VDC lock solenoid. Fail safe or fail secure options.
- 4. Installation requires only one cable run from the lock to the access control panel without requirements for additional proprietary lock panel interface boards or modules.
- 5. Installation to include manufacturer's access control panel interface board or module where required for Wiegand or OSDP output protocol.
- 6. Manufacturers:
 - a. Sargent Manufacturing (SA) SN200/SN210 10 Line.
- B. Integrated Wired Output Multi-Class Mortise Locks: Wiegand or Open Supervised Device Protocol (OSDP) output ANSI A156.13, Grade 1, mortise lockset with integrated card reader with or without keypad option, request-to-exit signaling, door position status switch, and latchbolt monitoring in one complete unit. Hard wired, solenoid driven locking/unlocking control of the lever handle trim, 3/4" deadlocking anti-friction latch, and 1" case-hardened steel deadbolt. Lock is U.L listed and labeled for use on up to 3 hour fire rated openings. Available with or without keyed high security cylinder override.
 - 1. Open architecture, hard wired platform supports centralized control of locking units with new or existing Wiegand or OSDP compatible access control systems. Latchbolt monitoring and door position switch act in conjunction to report door-in-frame (DPS) and door latched (door closed and latched) conditions.
 - 2. Integrated reader supports the following credentials:
 - a. 125kHz proximity credentials: HID, AWID, Indala, and EM4102.
 - b. 13.56 MHz proximity credentials: HID Secure Identity Object™ (SIO) on iCLASS Seos, HID iCLASS, HID iCLASS SE/SR, MIFARE Classic, DESFire EV1 and EV2.
 - c. 2.4 GHz credentials: Secure Identity Object™ (SIO) on Mobile IDs (Bluetooth Smart)
 - d. ISO14443A/B (PIV-compatible Transparent FASC-N read) available with pivCLASS variant
 - e. NFC-enabled mobile phones
 - f. PIN code only or PIN + credential with keypad option.

- 3. 12VDC external power supply required for reader and lock, with optional 24VDC lock solenoid. Fail safe or fail secure options.
- 4. Energy Efficient Design: Provide lock bodies which have a holding current draw of 500mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.
- 5. Support end-of-line resistors contained within the lock case.
- 6. Installation requires only one cable run from the lock to the access control panel without requirements for additional proprietary lock panel interface boards or modules.
- 7. Installation to include manufacturer's access control panel interface board or module where required for Wiegand or OSDP output protocol.
- 8. Manufacturers:
 - a. Sargent Manufacturing (SA) SN200/SN210 8200 Series.

2.10 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 - 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 - 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
 - 4. Short-lipped strikes: For locks at double doors.
- B. Standards: Comply with the following:
 - 1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 - 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 - 3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
 - 4. Dustproof Strikes: BHMA A156.16.

2.11 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
 - 1. Exit devices shall have a five-year warranty.
 - At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
 - 3. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the

proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.

- 4. Except on fire rated doors, provide exit devices with keyed cylinder dogging device to hold the pushbar and latch in a retracted position.
- 5. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
- 6. Flush End Caps: Provide flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.
- 7. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
 - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
- 8. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
- 9. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
- 10. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
- 11. Rail Sizing: Provide exit device rails factory sized for proper door width application.
- 12. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.
 - 1. Extended cycle test: Exit devices to have been cycle tested in ordinance with ANSI/BHMA 156.3 requirements to 5 million cycles or greater.
 - 2. Manufacturers:
 - a. Sargent Manufacturing (SA) 80 Series.

2.12 ELECTROMECHANICAL EXIT DEVICES

A. Electromechanical Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices subject to same compliance standards and requirements as mechanical exit devices. Electrified exit devices to be of type and design as specified below and in the hardware sets.

- 1. Where conventional power supplies are not sufficient, include any specific controllers required to provide the proper inrush current.
- 2. Motorized Electric Latch Retraction: Devices with an electric latch retraction feature must use motors which have a maximum current draw of 600mA. Solenoid driven latch retraction is not acceptable.
- 3. Manufacturers:
 - a. Sargent Manufacturing (SA) 80 Series.

2.13 INTEGRATED WIRED OUTPUT EXIT DEVICES - MULTI-CLASS READER

- A. Integrated Wired Output Multi-Class Exit Hardware: Wiegand output ANSI 156.3 Grade 1 rim, mortise, and vertical rod exit device hardware with integrated card reader with or without keypad option, latchbolt and touchbar monitoring, and request-to-exit signaling, in one complete unit. Hard wired, solenoid driven locking/unlocking control of the lever handle exit trim with 3/4" throw latch bolt. U.L listed and labeled for either panic or "fire exit hardware" for use on up to 3 hour fire rated openings. Available with or without keyed high security cylinder override.
 - Open architecture, hard wired platform supports centralized control of locking units with new or existing Wiegand or OSDP compatible access control systems. Inside push bar (request-to-exit) signaling and door position (open/closed status) monitoring (via separately connected DPS).
 - 2. Integrated reader supports the following credentials:
 - a. 125kHz proximity credentials: HID, AWID, Indala, and EM4102.
 - b. 13.56 MHz proximity credentials: HID Secure Identity Object™ (SIO) on iCLASS Seos, HID iCLASS, HID iCLASS SE/SR, MIFARE Classic, DESFire EV1 and EV2.
 - c. 2.4 GHz credentials: Secure Identity Object™ (SIO) on Mobile IDs (Bluetooth Smart)
 - d. ISO14443A/B (PIV-compatible Transparent FASC-N read) available with pivCLASS variant
 - e. NFC-enabled mobile phones
 - f. PIN code only or PIN + credential with keypad option
 - 3. 12VDC external power supply required for reader. 24VDC required for solenoid operated exit trim. Fail safe or fail secure options.
 - 4. Installation requires only one cable run from the exit hardware to the access control panel without requirements for additional proprietary lock panel interface boards or modules.
 - 5. Competitor Alternates Allowed Option: Installation to include manufacturer's access control panel interface board or module where required for Wiegand or OSDP output protocol.
 - 6. Manufacturers:
 - a. Sargent Manufacturing (SA) SN200/SN210 80 Series.

2.14 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

- 1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
- 2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
- 3. Cycle Testing: Provide closers which have surpassed 15 million cycles.
- 4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
- 5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
- 6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
- 7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.
- B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.
 - 1. Heavy duty surface mounted door closers shall have a 30-year warranty.
 - Manufacturers:
 - a. Sargent Manufacturing (SA) 351 Series.

2.15 SURFACE MOUNTED CLOSER HOLDERS

- A. Single Point Closer Holders: Single point closer holder designed to hold open fire or smoke rated doors until interruption of signal from fire alarm, smoke detector or remote release switch. Pull side, push side, or double egress mounting applications available with non-handed track and closer body and dual voltage input (24V/120V). Voltage to be 24VDC unless otherwise specified. Pull side mounted closers to have minimum adjustable hold-open range of 85 to 110 degrees. Auxiliary door stops are required at hold open point.
 - 1. Manufacturers:
 - a. Norton Rixson (NO) 7200 Series.

2.16 ELECTROHYDRAULIC DOOR OPERATORS

- A. Electrohydraulic Door Operators (High Traffic): Provide ANSI/BHMA A156.19 Certified Products Directory (CPD) listed low energy operators that meet ANSI/BHMA A156.4 requirements and are UL listed for use on fire rated doors and UL10C certified that comply with requirements for the Americans with Disabilities Act (ADA). Operators shall be verified by GreenCircle to offer energy savings of 19% when compared to similar products to accommodate openings up 250 pounds and 48" wide.
 - 1. Provide operators with features as follows:
 - a. Non-handed with push and pull side mounting.
 - b. Operates as mechanical surface closer during close cycles, when door is opened manually or if power is off.
 - c. Activation by push button, hands-free or radio frequency devices.
 - d. On board electronics to collect usage and cycle count data to facilitate preventative maintenance/diagnostics.
 - e. Two-year limited warranty.
 - f. Mounting backplate to simplify and speed up installation.
 - 2. Operators shall have the following functionality:
 - Adjustable Hold Open: Amount of time a door will stay in the full open position after an activation.
 - b. Infinite Hold Open: Door will hold open at set position until power is turned off.
 - c. Obstruction Detection: Door closes if it hits an obstruction while opening; door will reverse to open position if it hits an obstruction while closing. Door will stop once it hits an obstruction and will rest against the obstruction until removed.
 - d. Open Delay: Delays operator opening for locking hardware.
 - e. Overload Safety Shut-Off: After two minutes of receiving a door activation signal, inverter times out and door closes to prevent motor/inverter damage.
 - f. Presence Detector Input: Input for external sensor to detect presence at door open or close position only.
 - g. Push & Go: As the door is manually opened, the operator "senses" movement and opens door to the full-open position.
 - h. Selector Mode Switch: Off disables the signal inputs unless Blow Open is activated, on activates the signal inputs, hold open activates the unit (unless Blow Closed is activated) to the hold open position.
 - i. Vestibule Delay: When the wall switch is pressed, first door in vestibule will open. Second door will open once vestibule door delay has expired. Delay is adjustable.

3. Manufacturers:

a. Norton Rixson (NO) - 6000 Series.

2.17 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

- Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
- 3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
- 4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:
 - a. Stainless Steel: 300 grade, 050-inch thick.
- 5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
- 6. Manufacturers:
 - a. Rockwood (RO).

2.18 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 - 1. Manufacturers:
 - a. Rockwood (RO).
- C. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
 - 1. Manufacturers:
 - a. Norton Rixson (RF).

2.19 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and

- provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
 - 1. Pemko (PE).

2.20 ELECTRONIC ACCESSORIES

- A. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.
 - 1. Manufacturers:
 - a. Securitron (SU) DPS Series.
- B. Wiegand Test Unit: Test unit verifies proper Wiegand output integrated card reader lock installation in the field by testing for proper wiring, card reader data integrity, and lock functionality including lock/unlock, door position, and request-to-exit status. 12 or 24VDC voltage adjustable operating as Fail Safe or Fail Secure.
 - 1. Manufacturers:
 - a. Sargent Manufacturing (SA) WT2 Wiegand Test Unit.
- C. Intelligent Switching Power Supplies: Provide power supplies with single, dual or multi-voltage configurations at 12 and/or 24VDC. Power Supply shall have battery backup function with an integrated battery charging circuit. The power supply shall have a standard, integrated Fire Alarm Interface (FAI). The power supply shall provide capability for secondary voltage, power distribution, direct lock control and network monitoring through add on modules. The power

supply shall be expandable up to 16 individually protected outputs. Output modules shall provide individually protected, continuous outputs and/or individually protected, relay controlled outputs. Network modules shall provide remote monitoring functions such as status reporting, fault reporting and information logging.

- 1. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.
- 2. Manufacturers:
 - a. Securitron (SU) AQL Series.

2.21 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.22 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection (Punch Report): Reference Division 01 Sections "Closeout Procedures". Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.
 - 1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
 - 1. Quantities listed are for each pair of doors, or for each single door.
 - 2. The supplier is responsible for handing and sizing all products.
 - 3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

B. Manufacturer's Abbreviations:

- 1. MK McKinney
- 2. PE Pemko
- 3. SU Securitron
- 4. RO Rockwood
- 5. SA SARGENT
- 6. HS HES
- 7. RF Rixson
- 8. NO Norton

Hardware Sets

Set: 1.0

Doors: 230A, 230B, 305, 338, 402A, 423A, , 470A, 470B, 501, 502, 503, 504, 505, 507, 508, 509, 513, 514, 520, 610, 611, 611B, 612, 612A, 614, 617, 619, 620, 620A

Description: Classroom; Office; Conf - Card Access

3	Hinge (heavy weight)	T4A3786	US26D	MK
1	Access Control Lock (by Security)	SG IN100-10G77-BIPS LL GGMK	US26D	SA
1	Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Wall Stop	400 / 403 (as required)	US26D	RO
1	Head & Jamb Gasketing	S88BL ,		PΕ

Notes: Provide concealed overhead stop where wall stop cannot be mounted (door 611 and sim conditions, typ).

Operation: Door is normally closed and locked. Valid card at reader unlocks outside lever for momentary access. Monitoring by door position switch. Free egress at all times. Rotating inside lever will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.

Set: 2.0

Doors: 230C, 305A, 338A, 210S, 515A, 515B, B10 Description: Electric; Storage; Utility - Card Access

3	Hinge (heavy weight)	T4A3786	US26D	MK
1	Access Control Lock (by Security)	SG IN100-10G77-BIPS LL GGMK	US26D	SA
1	Conc Overhead Stop	6ADJ-x36	630	RF
1	Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Head & Jamb Gasketing	S88BL		PE

Notes:

Operation: Door is normally closed and locked. Valid card at reader unlocks outside lever for momentary access. Monitoring by door position switch. Free egress at all times. Rotating inside lever will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.

Set: 3.0

Doors:

Description: Data - Card Access (hardwired)

3 1	Hinge (heavy weight) Electric Power Transfer	T4A3786 EL-CEPT	US26D 630	MK SU
1	Access Control Lock (by Security)	SG SN210-10G271 BIPS-0E LL GGMK	US26D	SA
1	Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Wall Stop	400 / 403 (as required)	US26D	RO
1	Head & Jamb Gasketing	S88BL		PΕ
1	Door Wiring Harness	QC Series (jamb to device)		MK
1	Frame Wiring Harness	QC Series (jamb to J-box)		MK
1	Position Switch	DPS Series		SU
1	Power Supply	AQL4-R8E1		SU
1	Wiring Diagram	Elevation; Point-to-Point		

Notes:

Operation: Door is normally closed and locked. Valid card at reader unlocks outside lever for momentary access. Monitoring by door position switch. During a loss of power the door will remain latched, but

unlocked. Free egress at all times. Lock status will change to latched, but unlocked when the fire detection/suppression systems are activated. Rotating inside lever will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.

Set: 4.0

Doors: SA1, SA2

Description: Stair; Receiving Single- Card Access; Panic

3	Hinge (heavy weight)	T4A3786	US26D	MK
1	Access Control Rim Exit (by Security)	SG (12) IN100-8877-BIPS ETL GGMK	US32D	SA
1	Conc Overhead Stop	6ADJ-x36	630	RF
1	Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Head & Jamb Gasketing	S88BL		PE

Notes:

Operation: Door is normally closed and locked. Valid card at reader unlocks outside lever for momentary access. Monitoring by door position switch. Free egress at all times. Rotating inside lever will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.

Set: 5.0

Doors: C120, C320

Description: Elev Vest Pair - Card Access

6	Hinge (heavy weight)	T4A3786	US26D	MK
1	Dust Proof Strike	570	US26D	RO
1	Flush Bolt (constant-latching)	2845; 2945	US26D	RO
1	Access Control Lock (by Security)	SG IN100-10G77-BIPS LL GGMK	US26D	SA
1	Coordinator	1700	Black	RO
2	Elec-Mech Closer/Holder	7200MPSO Series	689	NO
2	Kick Plate	K1050 10" 4BE CSK	US32D	RO
2	Wall Stop	400 / 403 (as required)	US26D	RO
1	Meeting Stile Seal	S772BL		PE
1	Astragal (flat bar)	357C		PE
1	Head & Jamb Gasketing	S88BL		PE

Notes:

Operation: Door is normally closed and locked. Valid card at reader unlocks outside lever for momentary access. Monitoring by door position switch. During a loss of power the door will remain latched, but unlocked. Free egress at all times. Lock status will change to latched, but unlocked when the fire detection/suppression systems are activated. Rotating inside lever will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.

<u>Set: 6.0</u>

Doors: 104B, 104G, 127B, 127G, 208B, 208G, 227B, 227G, 308, 309, 327B, 327G, 517A, 517B, 519A, 519B, 616

Description: Single-Fixture; Multi-Fixture Toilet - Card Access

	Hinge (heavy weight)	T4A3786	US26D	MK
1	Access Control Lock (by Security)	SG IN100-10G77-BIPS LL GGMK	US26D	SA
1	Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Mop Plate	K1050 6" 4BE CSK	US32D	RO
1	Wall Stop	400 / 403 (as required)	US26D	RO
1	Head & Jamb Gasketing	S88BL		PΕ

Notes:

Operation: Door is normally closed and locked. Valid card at reader unlocks outside lever for momentary access. Monitoring by door position switch. Free egress at all times. Rotating inside lever will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.

Set: 7.0

Doors: SC1, SC2

Description: Stair Single - Hold Open

1	Continuous Hinge	CFM-SLF-HD1-M Series		PE
1	Rim Exit Device, Passage	12 8815 ETL	US32D	SA
1	Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Electromagnetic Holder	998M (or to suit conditions)	689	RF
1	Head & Jamb Gasketing	S88BL		PΕ

Notes: Interface with building fire alarm system to release door(s) from hold open.

Set: 8.0

Doors:

Description: Stair Double - Hold Open

2	Continuous Hinge	CFM-SLF-HD1-M Series		PΕ
2	Surface Vert Rod Exit, Passage	12 NB8715 ETL	US32D	SA
2	Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
2	Kick Plate	K1050 10" 4BE CSK	US32D	RO
2	Electromagnetic Holder	998M (or to suit conditions)	689	RF
1	Meeting Stile Seal	S772BL		PΕ
1	Head & Jamb Gasketing	S88BL		PΕ

Notes: Interface with building fire alarm system to release door(s) from hold open.

Set: 9.0

Doors: 423, 460

Description: Assembly Space Double - Card Access (both leaves)

2	Continuous Hinge	CFM-SLF-HD1-M Series		PE
1	Key Removeable Mullion	12-L980	PC	SA
2	Access Control Rim Exit (by Security)	SG (12) IN100-8877-BIPS ETL GGMK	US32D	SA
1	Mullion Cylinder	980Č1 GGMK	US26D	SA
2	Conc Overhead Stop	6ADJ-x36	630	RF
2	Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
2	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Meeting Stile Seal	S772BL		PΕ
1	Head & Jamb Gasketing	S88BL		PΕ
1	Mullion Gasketing	5110BL		PE

Notes:

Operation: Door is normally closed and locked. Valid card at reader unlocks outside lever for momentary access. Monitoring by door position switch. Free egress at all times. Depressing pushrail will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.

Set: 10.0

Doors:

Description: Assembly Space Single - Card Access

1	Continuous Hinge	CFM-SLF-HD1-M Series		PΕ
1	Access Control Rim Exit (by Security)	SG (12) IN100-8877-BIPS ETL GGMK	US32D	SA
1	Conc Overhead Stop	6ADJ-x36	630	RF
1	Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Head & Jamb Gasketing	S88BL		PΕ

Notes:

Operation: Door is normally closed and locked. Valid card at reader unlocks outside lever for momentary access. Monitoring by door position switch. Free egress at all times. Depressing pushrail will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.

Set: 11.0

Doors: C100, C101, C102, C200, C201, C202, C203, C204, C205, C206, C230, C230A, C250, C260, C270, C300, C301, C302, C302A, C304, C400, C401, C401A, C425, C430, C440, C470, C470A, C601, C602 Description: Corridor Double - Hold Open

2	Continuous Hinge	CFM-SLF-HD1-M Series		PΕ
2	Surface Vert Rod Exit, Passage	12 NB8715 ETL	US32D	SA
2	Elec-Mech Closer/Holder	7200MPSO Series	689	NO
2	Kick Plate	K1050 10" 4BE CSK	US32D	RO
2	Wall Stop	400 / 403 (as required)	US26D	RO
1	Meeting Stile Seal	S772BL		PΕ
1	Head & Jamb Gasketing	S88BL		PΕ

Notes: Interface with building fire alarm system to release door(s) from hold open. Coordinate type of hold open (closer, wall mount) with Electrical/GC and pocket conditions (typ). Coordinate door stop mounting with desired degree of hold open.

Provide concealed overhead stop where wall stop cannot be mounted.

Operation: Door is normally closed and locked. Valid card at reader unlocks outside lever for momentary access. Monitoring by door position switch. During a loss of power the door will remain latched, but unlocked. Free egress at all times. Lock status will change to latched, but unlocked when the fire detection/suppression systems are activated. Depressing pushrail will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.Interface with building fire alarm system to release door(s) from hold open.

Set: 11.1

Doors: C601A, C602A, C602B

Description: Corridor Double - Hold Open (120 Min Rated)

2	Continuous Hinge	CFM-SLF-HD1-M Series		PΕ
1	Surface Vert Rod Exit, Passage	12 NB8715 ETL	US32D	SA
1	Mortise Exit Device, Passage	12 8915 ETL	US32D	SA
1	Coordinator	1700	Black	RO
1	Carry Bar	1100	US32D	RO
2	Elec-Mech Closer/Holder	7200MPSO Series	689	NO
2	Kick Plate	K1050 10" 4BE CSK	US32D	RO
2	Wall Stop	400 / 403 (as required)	US26D	RO
1	Meeting Stile Seal	S772BL		PΕ
1	Astragal (flat bar)	357C		PΕ
1	Head & Jamb Gasketing	S88BL		PΕ

Notes: Interface with building fire alarm system to release door(s) from hold open. Coordinate type of hold open (closer, wall mount) with Electrical/GC and pocket conditions (typ). Coordinate door stop mounting with desired degree of hold open.

Provide concealed overhead stop where wall stop cannot be mounted.

Operation: Door is normally closed and locked. Valid card at reader unlocks outside lever for momentary access. Monitoring by door position switch. During a loss of power the door will remain latched, but unlocked. Free egress at all times. Lock status will change to latched, but unlocked when the fire detection/suppression systems are activated. Depressing pushrail will activate request to exit switch for appropriate monitor by EAC systems. Outside key override. Interface with building fire alarm system to release door(s) from hold open.

Set: 12.0

Doors: 601A, 601B, E601A, E601B

Description: Alum Entry Pair - Card and/or Remote Access; Auto (hardwired)

2	Continuous Hinge	CFM-SLF-HD1 EL-CEPTx32D		PE
1	Access Control CVR Exit (by Security)	curity) 16 SG 56-SN210-8610 BIPS-0E 106 GGMK		US32D
	SA			
1	Concealed Vert Rod Exit, EL	16 SG 53 55 56 8610 EO GGMK	US32D	SA
2	Pull	SG 862	US32D	SA
2	Conc Overhead Stop	6ADJ-x36	630	RF
1	Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
1	Automatic Opener	6061; 6071 D	689	NO
2	Astragal (brush)	18041CNB		PE
2	Sweep	18061CNB		PE
1	Threshold (coord w/ details)	2010APK FG Pemkote FHSL14SS		PE
2	Door Wiring Harness	QC Series (jamb to device)		MK
2	Frame Wiring Harness	QC Series (jamb to J-box)		MK
2	Position Switch	DPS Series		SU
2	Door Switch	671		NO
1	Power Supply	AQL4-R8E1		SU
1	Card Reader	By Security Vendor		
1	Remote Release Switch	By Security Vendor		
1	Weather/Perimeter Seals	Supplied with door/frame assembly		
1	Wiring Diagram	Elevation; Point-to-Point		

Notes:

Operation: Door is normally closed and secured. Valid card at reader or signal from remote switch retracts latches for momentary access, then enables outside actuator. Inside actuator retracts latch, then auto opens door. Monitoring by door position switches. During a loss of power the door will default to secure. Free egress at all times. Lock status will not change when the fire detection/suppression systems are activated. Depressing pushrail will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.

Set: 13.0

Doors: C501, E251, E252, E443, E600A, E600B, EC103, EC200, EC206, EC230B, EC230C, EC240, EC240A, EC240B, EC241, EC400, EC401, EC410, EC430, EC455, EC455A, EC460, EC501, EC601A, EC601B, EC602A, EC602B, ESD1, ESE1, ESG1, ESH1

Description: Alum or FRP Entry Pair - Card Access (hardwired)

2 1	••····································	CFM-SLF-HD1 EL-CEPTx32D 16 SG 56-SN210-8610 BIPS-0E 106 GG	GMK	PE US32D
1	Concealed Vert Rod Exit, EL	16 SG 53 55 56 8610 EO GGMK	US32D	SA
2	Pull	SG 862	US32D	SA
2	Conc Overhead Stop	6ADJ-x36	630	RF
2	Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
2	Astragal (brush)	18041CNB		PE
2	Sweep	18061CNB		PE

1	Threshold (coord w/ details)	2010APK FG Pemkote FHSL14SS	PE
2	Door Wiring Harness	QC Series (jamb to device)	MK
2	Frame Wiring Harness	QC Series (jamb to J-box)	MK
2	Position Switch	DPS Series	SU
1	Power Supply	AQL4-R8E1	SU
1	Card Reader	By Security Vendor	
4	W (I /D : (O I		

1 Weather/Perimeter Seals Supplied with door/frame assembly

1 Wiring Diagram Elevation; Point-to-Point

Notes:

Operation: Doors are normally closed and locked. Valid card at reader retracts latch for momentary access. Monitoring by door position switches. During a loss of power the door will default to secure. Free egress at all times. Lock status will not change when the fire detection / suppression systems are activated. Depressing pushrail will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.

Set: 14.0

Doors: E450, EC450, EC450A, EC500A

Description: Alum Entry Single - Card Access; Panic (hardwired)

1	Continuous Hinge	CFM-SLF-HD1 EL-CEPTx32D		PE
1	Access Control Rim Exit (by Security)	16 SG 56-SN210-8804 BIPS-0E GGMK	US32D	SA
1	Pull	SG 862	US32D	SA
1	Conc Overhead Stop	6ADJ-x36	630	RF
1	Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
1	Sweep	18061CNB		PE
1	Threshold (coord w/ details)	2010APK FG Pemkote FHSL14SS		PE
1	Door Wiring Harness	QC Series (jamb to device)		MK
1	Frame Wiring Harness	QC Series (jamb to J-box)		MK
1	Position Switch	DPS Series		SU
1	Power Supply	AQL4-R8E1		SU
1	Card Reader	By Security Vendor		
1	Weather/Perimeter Seals	Supplied with door/frame assembly		
1	Wiring Diagram	Elevation; Point-to-Point		

Notes:

Operation: Doors are normally closed and locked. Valid card at reader retracts latch for momentary access. Monitoring by door position switches. During a loss of power the door will default to secure. Free egress at all times. Lock status will not change when the fire detection / suppression systems are activated. Depressing pushrail will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.

Set: 15.0

Doors: E117, E350, E498A, EC470, EC470A, EC470D

Description: Alum or FRP Single - Card Access; Lock (hardwired)

1	Continuous Hinge	CFM-SLF-HD1 EL-CEPTx32D		PΕ
1	Access Control Lock (by Security)	SG SN210-82271 BIPS-0E LNL GGMK	US26D	SA
1	Conc Overhead Stop	6ADJ-x36	630	RF
1	Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
1	Sweep	18061CNB		PE
1	Threshold (coord w/ details)	2716AK FHSL14SS		PE
1	Door Wiring Harness	QC Series (jamb to device)		MK
1	Frame Wiring Harness	QC Series (jamb to J-box)		MK
1	Position Switch	DPS Series		SU
1	Power Supply	AQL4-R8E1		SU
1	Weather/Perimeter Seals	Supplied with door/frame assembly		

1 Wiring Diagram Elevation; Point-to-Point

Notes:

Operation: Door is normally closed and locked. Valid card at reader unlocks outside lever for momentary access. Monitoring by door position switch. During a loss of power the door will default to secure. Free egress at all times. Lock status will not change when the fire detection/suppression systems are activated. Rotating inside lever will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.

Set: 16.0

Doors: E498

Description: FRP Pair Receiving - Card Access; Panics (hardwired)

1 Access Control CVR Exit (by Security) 16 SG 56-SN210-8610 BIPS-0E 106 GGMK SA 1 Concealed Vert Rod Exit, EL 16 SG 53 55 56 8610 EO GGMK US32D SA 2 Pull SG 862 US32D SA 2 Conc Overhead Stop 6ADJ-x36 630 RF 2 Door Closer 351 P10; O (per part 2); OZ @ alum EN SA 2 Astragal 305CN PE 2 Sweep 18061CNB PE 1 Threshold (coord w/ details) 2010APK FG Pemkote FHSL14SS PE 1 Threshold (coord w/ details) QC Series (jamb to device) MK 2 Frame Wiring Harness QC Series (jamb to J-box) MK 2 Position Switch DPS Series SU 1 Power Supply AQL4-R8E1 SU 1 Weather/Perimeter Seals Supplied with door/frame assembly Elevation; Point-to-Point	2	Continuous Hinge	CFM-SLF-HD1 EL-CEPTx32D		PE
1 Concealed Vert Rod Exit, EL 2 Pull SG 862 Conc Overhead Stop 6ADJ-x36 Door Closer 351 P10; O (per part 2); OZ @ alum Astragal Sweep 1 Rod Coord w/ details) 2 Door Wiring Harness C C Series (jamb to device) C Frame Wiring Harness C Position Switch DPS Series Down Weather/Perimeter Seals 16 SG 53 55 56 8610 EO GGMK US32D SA US32D SA US32D SA US32D SA 630 RF EN SA 2010 Per part 2); OZ @ alum EN SA 2020 PE 2010 APK FG Pemkote FHSL14SS PE 2010 APK FG Pemkote FHSL14SS PE 3010 AV SU MK SU Supplied with door/frame assembly	1	Access Control CVR Exit (by Security)	16 SG 56-SN210-8610 BIPS-0E 106 G0	SN210-8610 BIPS-0E 106 GGMK	
2 Pull SG 862 US32D SA 2 Conc Overhead Stop 6ADJ-x36 630 RF 2 Door Closer 351 P10; O (per part 2); OZ @ alum EN SA 2 Astragal 305CN PE 2 Sweep 18061CNB PE 1 Threshold (coord w/ details) 2010APK FG Pemkote FHSL14SS PE 2 Door Wiring Harness QC Series (jamb to device) MK 2 Frame Wiring Harness QC Series (jamb to J-box) MK 2 Position Switch DPS Series SU 1 Power Supply AQL4-R8E1 SU 1 Weather/Perimeter Seals Supplied with door/frame assembly		SA			
2 Conc Overhead Stop 6ADJ-x36 630 RF 2 Door Closer 351 P10; O (per part 2); OZ @ alum EN SA 2 Astragal 305CN PE 2 Sweep 18061CNB PE 1 Threshold (coord w/ details) 2010APK FG Pemkote FHSL14SS PE 2 Door Wiring Harness QC Series (jamb to device) MK 2 Frame Wiring Harness QC Series (jamb to J-box) MK 2 Position Switch DPS Series SU 1 Power Supply AQL4-R8E1 SU 1 Weather/Perimeter Seals Supplied with door/frame assembly	1	Concealed Vert Rod Exit, EL	16 SG 53 55 56 8610 EO GGMK	US32D	SA
2 Door Closer 351 P10; O (per part 2); OZ @ alum EN SA 2 Astragal 305CN PE 2 Sweep 18061CNB PE 1 Threshold (coord w/ details) 2010APK FG Pemkote FHSL14SS PE 2 Door Wiring Harness QC Series (jamb to device) MK 2 Frame Wiring Harness QC Series (jamb to J-box) MK 2 Position Switch DPS Series SU 1 Power Supply AQL4-R8E1 SU 1 Weather/Perimeter Seals Supplied with door/frame assembly	2	Pull	SG 862	US32D	SA
2 Astragal 305CN PE 2 Sweep 18061CNB PE 1 Threshold (coord w/ details) 2010APK FG Pemkote FHSL14SS PE 2 Door Wiring Harness QC Series (jamb to device) MK 2 Frame Wiring Harness QC Series (jamb to J-box) MK 2 Position Switch DPS Series SU 1 Power Supply AQL4-R8E1 SU 1 Weather/Perimeter Seals Supplied with door/frame assembly	2	Conc Overhead Stop	6ADJ-x36	630	RF
2 Sweep 18061CNB PE 1 Threshold (coord w/ details) 2010APK FG Pemkote FHSL14SS PE 2 Door Wiring Harness QC Series (jamb to device) MK 2 Frame Wiring Harness QC Series (jamb to J-box) MK 2 Position Switch DPS Series SU 1 Power Supply AQL4-R8E1 SU 1 Weather/Perimeter Seals Supplied with door/frame assembly	2	Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
1 Threshold (coord w/ details) 2 Door Wiring Harness QC Series (jamb to device) MK 2 Frame Wiring Harness QC Series (jamb to J-box) MK 2 Position Switch DPS Series SU 1 Power Supply AQL4-R8E1 SU 2 Weather/Perimeter Seals Supplied with door/frame assembly	2	Astragal	305CN		PE
2 Door Wiring Harness QC Series (jamb to device) MK 2 Frame Wiring Harness QC Series (jamb to J-box) MK 2 Position Switch DPS Series SU 1 Power Supply AQL4-R8E1 SU 1 Weather/Perimeter Seals Supplied with door/frame assembly	2	Sweep	18061CNB		PE
2 Frame Wiring Harness QC Series (jamb to J-box) MK 2 Position Switch DPS Series SU 1 Power Supply AQL4-R8E1 SU 1 Weather/Perimeter Seals Supplied with door/frame assembly	1	Threshold (coord w/ details)	2010APK FG Pemkote FHSL14SS		PE
2 Position Switch DPS Series SU 1 Power Supply AQL4-R8E1 SU 1 Weather/Perimeter Seals Supplied with door/frame assembly	2	Door Wiring Harness	QC Series (jamb to device)		MK
1 Power Supply AQL4-R8E1 SU 1 Weather/Perimeter Seals Supplied with door/frame assembly	2	Frame Wiring Harness	QC Series (jamb to J-box)		MK
1 Weather/Perimeter Seals Supplied with door/frame assembly	2	Position Switch	DPS Series		SU
	1	Power Supply	AQL4-R8E1		SU
1 Wiring Diagram Elevation; Point-to-Point	1	Weather/Perimeter Seals	Supplied with door/frame assembly		
	1	Wiring Diagram	Elevation; Point-to-Point		

Notes:

Operation: Door is normally closed and locked. Valid card at reader unlocks outside lever for momentary access. Monitoring by door position switch. During a loss of power the door will default to secure. Free egress at all times. Lock status will not change when the fire detection/suppression systems are activated. Depressing pushrail will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.

Set: 17.0

Doors: E246, E252D, E260, E402, E404, E406, E408, E410, E414, E416, E418, E420, E422, E424, E460, E460A, E460B, E475, EC602D, ESF4, ESH4

Description: FRP egress Single - Card Access; Panic (hardwired)

1 Continuous Hinge 1 Access Control Rim Exit (by Security) 1 Pull 1 Conc Overhead Stop 1 Door Closer 1 Sweep 1 Threshold (coord w/ details) 1 Door Wiring Harness 1 Position Switch 1 Power Supply 1 Weather/Perimeter Seals 1 VS32D 16 SG 56-SN210-8804 BIPS-0E GGMK US32D 16 SG 862 19 US32D 16 SG 862 10 US32D 16 SG 862 10 US32D 16 SG 862 10 US32D 16 SG 862 10 US32D 16 SG 862 10 US32D 16 SG 862 10 US32D 16 SG 862 10 US32D 16 SG 862 10 US32D 16 SG 862 10 US32D 16 SG 862 10 US32D 16 SG 862 10 US32D 16 SG 862 10 US32D 16 SG 862 10 US32D 16 SG 862 10 US32D 16 SG 56-SN210-8804 BIPS-0E GGMK US32D 18 SG 862 10 US32D 16 SG 862 16 SG 862 16 SG 862 16 SG 862 16 SG 862 16 SG 862 16 SG 862 16 SG 862 16 SG	PE SA SA RF SA PE MK SU SU
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Notes:

Operation: Door is normally closed and locked. Valid card at reader unlocks outside lever for momentary

access. Monitoring by door position switch. During a loss of power the door will default to secure. Free egress at all times. Lock status will not change when the fire detection/suppression systems are activated. Depressing pushrail will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.

Set: 18.0

Doors: E412, E429, E433

Description: FRP Office; Storage; Roof - Card Access; Lock (hardwired)

1	Continuous Hinge	CFM-SLF-HD1 EL-CEPTx32D		PΕ
1	Access Control Lock (by Security)	SG SN210-10G271 BIPS-0E LL GGMK	US26D	SA
1	Conc Overhead Stop	6ADJ-x36	630	RF
1	Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
1	Sweep	18061CNB		PΕ
1	Threshold (coord w/ details)	2010APK FG Pemkote FHSL14SS		PΕ
1	Door Wiring Harness	QC Series (jamb to device)		MK
1	Frame Wiring Harness	QC Series (jamb to J-box)		MK
1	Position Switch	DPS Series		SU
1	Power Supply	AQL4-R8E1		SU
1	Weather/Perimeter Seals	Supplied with door/frame assembly		
1	Wiring Diagram	Elevation; Point-to-Point		

Notes

Operation: Door is normally closed and locked. Valid card at reader unlocks outside lever for momentary access. Monitoring by door position switch. During a loss of power the door will default to secure. Free egress at all times. Lock status will not change when the fire detection/suppression systems are activated. Rotating inside lever will activate request to exit switch for appropriate monitor by EAC systems. Outside key override.

Set: 19.0

Doors: EBO1

Description: Exterior Boiler Rm Pair

Continuous Hinge	CFM-SLF-HD1-M Series		PE
Flush Bolt	555 / 557 (as required)	US26D	RO
Dust Proof Strike	570	US26D	RO
Storeroom Lock	SG 8204 LNL GGMK	US26D	SA
Conc Overhead Stop	6ADJ-x36	630	RF
Door Closer	351 P10; O (per part 2); OZ @ alum	EN	SA
Kick Plate	K1050 10" 4BE CSK	US32D	RO
Astragal	355CPK		PΕ
Gasketing	2891AS (head & jambs)		PE
Threshold (coord w/ details)	2010APK FG Pemkote FHSL14SS		PE
	Dust Proof Strike Storeroom Lock Conc Overhead Stop Door Closer Kick Plate Astragal Gasketing	Flush Bolt 555 / 557 (as required) Dust Proof Strike 570 Storeroom Lock SG 8204 LNL GGMK Conc Overhead Stop 6ADJ-x36 Door Closer 351 P10; O (per part 2); OZ @ alum Kick Plate K1050 10" 4BE CSK Astragal 355CPK Gasketing 2891AS (head & jambs)	Flush Bolt 555 / 557 (as required) US26D Dust Proof Strike 570 US26D Storeroom Lock SG 8204 LNL GGMK US26D Conc Overhead Stop 6ADJ-x36 630 Door Closer 351 P10; O (per part 2); OZ @ alum Kick Plate K1050 10" 4BE CSK US32D Astragal 355CPK Gasketing 2891AS (head & jambs)

Set: 20.0

Doors: 500, 500A

Description: ADA Lift - Card Access (hardwired)

3 1 1 1 1 1 1	Hinge (heavy weight) Electric Power Transfer Access Control Lock (by Security) Conc Overhead Stop Door Closer Kick Plate Head & Jamb Gasketing Door Wiring Harness	T4A3786 EL-CEPT SG SN210-10G271 BIPS-0E LL GGMK 6ADJ-x36 351 P10; O (per part 2); OZ @ alum K1050 10" 4BE CSK S88BL QC Series (jamb to device)	US26D 630 US26D 630 EN US32D	MK SU SA RF SA RO PE MK
1	Door Wiring Harness	QC Series (jamb to device)		MK
1	Frame Wiring Harness	QC Series (jamb to J-box)		MK
1	Position Switch	DPS Series		SU

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1 Power Supply AQL4-R8E1 SU

1 Wiring Diagram Elevation; Point-to-Point

Notes: Coordinate with Lift manufacturer. Cylinder should be keyed "special" for use only by lift service technician.

Operation: Door is normally closed and locked. Valid card at reader unlocks outside lever for momentary access. Monitoring by door position switch. During a loss of power the door will default to secure. Free egress at all times. Lock status will not change when the fire detection/suppression systems are activated. Rotating inside lever will activate request to exit switch for appropriate monitor by EAC systems. Outside key override. Card reader is disabled when lift is not at corresponding floor. Lift is disabled when door is in open position.

Set: 21.0

Doors: Misc Items

Description: Access Control Products

35 Hub (by Security) AH30R12 SA
1 Weigand Test Unit WT2 SA

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Glass and glazing for the following products and applications:
 - Steel doors, frames and sidelights specified in Section 081110 HOLLOW METAL DOORS AND FRAMES.
 - Glazed entrances and storefronts specified in Section 084110 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS.
 - c. Glazed curtain walls specified in Section 084410 GLAZED ALUMINUM CURTAIN WALLS.
 - d. Interior lites.
 - e. Unframed mirrors.
 - f. Glazing film.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 081400 FLUSH WOOD DOORS for factory glazing.

1.3 DEFINITIONS

- A. Manufacturers of Glass Products: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.
- D. Deterioration of Coated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.
- E. Deterioration of Insulating Glass: Failure of hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for

maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

F. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Glass Design: Glass thickness designations indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites in the thickness designations indicated for various size openings, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
 - 1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
 - a. Specified Design Wind Loads: As required by Code.
 - b. Specified Design Snow Loads for Sloped Glazing: As required by Code.
 - c. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action.
 - 1) Load Duration: 60 seconds or less.
 - d. Probability of Breakage for Sloped Glazing: 1 lite per 1000 for lites set more than 15 degrees off vertical and under wind and snow action.
 - 1) Load Duration: 30 days.
 - e. Maximum Lateral Deflection: For the following types of glass supported on all 4 edges, provide thickness required that limits center deflection at design wind pressure to 1/50 times the short side length or 1 inch, whichever is less.
 - 1) For monolithic-glass lites heat-treated to resist wind loads.
 - 2) For insulating glass.
 - 3) For laminated-glass lites.
 - f. Minimum Glass Thickness for Exterior Lites: Not less than 6 mm.
- C. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass

framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

- 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:
 - 1. For monolithic-glass lites, properties are based on units with lites 6.0 mm thick.
 - 2. For laminated-glass lites, properties are based on products of construction indicated.
 - 3. For insulating-glass units, properties are based on units with lites 6.0 mm thick and a nominal 1/2-inch-wide interspace.
 - 4. Center-of-Glass Values: Based on using LBL-44789 WINDOW 6.3 computer program for the following methodologies:
 - a. U-Factors: NFRC 100 expressed as Btu/sq. ft. x h x deg F.
 - b. Solar Heat Gain Coefficient: NFRC 200.
 - Solar Optical Properties: NFRC 300.

1.5 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Samples: 12-inch- square Samples for each type of glass and glass assembly, glazing sealants.
- C. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- D. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
 - 1. For solar-control low-e-coated glass, provide documentation demonstrating that manufacturer of coated glass is certified by coating manufacturer.
- E. Qualification Data: For installers.
- F. Preconstruction Adhesion and Compatibility Test Report: From glazing sealant manufacturer indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.
- G. Product Test Reports: For each type of glazing products:
- H. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance..
- B. Source Limitations for Glass: Obtain the following through one source from a single manufacturer for each glass type: clear float glass, laminated glass and insulating glass.

- C. Source Limitations for Glass Sputter-Coated with Solar-Control Low-E Coatings: Where solar-control low-e coatings of a primary glass manufacturer that has established a certified fabricator program is specified, obtain sputter-coated solar-control low-e-coated glass in fabricated units from a manufacturer that is certified by coated-glass manufacturer.
- D. Source Limitations for Glazing Accessories: Obtain glazing accessories through one source from a single manufacturer for each product and installation method indicated.
- E. Elastomeric Glazing Sealant Product Testing: Obtain sealant test results for product test reports in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.
 - 1. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
 - 2. Test elastomeric glazing sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
- F. Preconstruction Adhesion and Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing indicated below, samples of each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants:
 - 1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
 - 2. Submit not fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
 - 5. Testing will not be required if elastomeric glazing sealant manufacturers submit data based on previous testing of current sealant products for adhesion to, and compatibility with, glazing materials matching those submitted.
- G. Fire-Protection-Rated Glazing: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on positive-pressure testing according to NFPA 257 or UL 9, including the hose-stream test, and shall comply with NFPA 80.
 - 1. Fire-protection-rated glazing required to have a fire-protection rating of 20 minutes shall be exempt from the hose-stream test, unless required by authorities having jurisdiction.
- H. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201.
 - 1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council or another certification agency] acceptable to authorities having jurisdiction.
 - Where glazing units, including Kind FT glass and laminated glass, are specified in Part 2 articles for glazing lites more than 9 sq. ft. in exposed surface area of one side, provide glazing products that comply with Category II materials, for lites 9 sq. ft. or less in exposed surface area of one side, provide glazing products that comply with Category I or II materials, except for hazardous locations where Category II materials are required by 16 CFR 1201 and regulations of authorities having jurisdiction.

- I. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: GANA Laminated Division's "Laminated Glass Design Guide" and GANA's "Glazing Manual."
 - 2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR-A7, "Sloped Glazing Guidelines."
 - 3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Sloped Glazing Guidelines."
 - 4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units."
- J. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following testing and inspecting agency:
 - 1. Insulating Glass Certification Council.
- K. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockup for types of windows indicated, in locations shown on Drawings.
- L. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
 - 1. Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 40 deg F.

1.9 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form, made out to the Owner and signed by coated-glass manufacturer agreeing to replace coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: Ten years from date of Substantial Completion.

- B. Manufacturer's Special Warranty on Laminated Glass: Manufacturer's standard form, made out to the Owner and signed by laminated-glass manufacturer agreeing to replace laminated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- C. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form, made out to the Owner and signed by insulating-glass manufacturer agreeing to replace insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: Ten years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 INSULATING-GLASS UNITS

- A. Insulating-Glass Units for Vertical Glazing: 1 inch thick (25.0 mm) insulating glass consisting of two lites of 1/4 inch (6 mm) glass, low e coating on the No. 2 surface and argon gas filled. Provide one of the following or equal:
 - 1. Guardian Industries; SN-68.
 - a. Visible Light Transmittance: 68 percent.
 - b. Reflectance Visible Light: 10 percent.
 - c. U Value (Winter): 0.25.
 - d. Shading Coefficient: 0.43.
 - e. Solar Heat Gain Coefficient: 0.38.
 - 2. Viracon; VE1-2M.
 - a. Visible Light Transmittance: 70 percent.
 - b. Reflectance Visible Light: 11 percent.
 - c. U Value (Winter): 0.25.
 - d. Shading Coefficient: 0.43.
 - e. Solar Heat Gain Coefficient: 0.37.
 - 3. Vitro Architectural Glass (formerly PPG Industries); Solarban 60.
 - a. Visible Light Transmittance: 70 percent.
 - b. Reflectance Visible Light: 11 percent.
 - c. U Value (Winter): 0.29.
 - d. Shading Coefficient: 0.44.
 - e. Solar Heat Gain Coefficient: 0.38.
- B. Building Product Disclosure and Optimization, Environmental Product Declarations (EPD): Type III EPD.

2.2 GLASS PRODUCTS

A. Schedule:

- 1. Exterior Doors 1 inch insulated (1/4 inch clear fully tempered low-E Solarban 70XL, 1/2 inch air space, 1/4 inch clear fully tempered
- 2. Storefront fixed glazing and windows 1 inch insulated glass (1/4 inch clear annealed, Low-E Solarban 70XL, 1/2 inch air space, 1/4 inch clear annealed
- 3. Spandrel 1 inch insulated (1/4 inch heat strengthened Low-E Solarban 70XL, 1/2 inch air space, 1/4 inch clear heat strengthened with silicone coating on #4 surface Opacicoat 300
- 4. Interior Non-Rated Glazing ==1/4" clear tempered
- B. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.
 - 1. Building Product Disclosure and Optimization, Environmental Product Declarations (EPD): Type III EPD.
- C. Insulated Security Glass Units:
 - 1. Product: SG4 by School Guard Glass as manufactured by Laminated Technologies Inc. (844) 744-5277; Global Security Glazing, Child Guard Glass; or approved equal.
 - a. Security glazing shall have the following characteristics
 - 1) No more than 3/8" nominal glass lite thickness
 - 2) No more than 4.16 lbs. per square footise?
 - 3) 5-aa1 rated for a minimum of 6 minutes
 - 4) Glass clad on interior and exterior surfaces
 - 5) F1233 rated [SEP]
 - 6) Optical Haze of no more than 1.8%
 - 2. Insulated Security Glass Unit Assemblies:
 - a. Insulating Glass Units for Vertical Glazing: Type (SG4):
 - 1) Overall thickness: 1" inch thick insulating glass
 - 2) Outerlite: 1/4" tempered glass, low e coating on the No. 2 surface.
 - 3) Airspace: 3/8" thick argon gas filled space, and mill finish warm edge air spacer.
 - 4) Innerlite: SG4 with low-e coating on the No. 2 surface and no. 5 (for triple glazed).
- D. Heat-Treated Float Glass: ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
 - 2. For uncoated glass, comply with requirements for Condition A.
 - 3. For coated vision glass, comply with requirements for Condition C (other coated glass).

- E. Coated Float Glass: Pyrolytic and vacuum deposited coatings on glass in conformance with ASTM C 1376.
- F. Uncoated Tinted Float Glass: Class 2, complying with other requirements specified.
 - Tint Color: As selected by the Architect.
 - 2. Visible Light Transmittance: As standard with manufacturer.
- G. Tempered Float Glass: ASTM C 1048; Type I (transparent flat glass); Quality-Q3; Kind FT; 1/4 inch thick unless indicated otherwise.
- H. Patterned Glass: ASTM C 1036, Type II (patterned and wired flat glass), Class 1 (clear), Form 3 (patterned); and of quality, finish, and pattern specified.
- I. Laminated Glass: ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for Category II materials, and with other requirements specified. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
 - 1. Construction for Framed Units: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written recommendations.
 - 2. Construction for Units with Exposed Edges: Laminate glass with cast-in-place and cured-transparent-resin interlayer to comply with interlayer manufacturer's written recommendations.
 - 3. Interlayer Thickness: 0.030 inch (0.76 mm) thick for vertical glazing, 0.060 inch (1.52 mm) thick for sloped glazing.
 - 4. Interlayer Color: Clear unless otherwise indicated.
- J. Fire-Rated Monolithic Ceramic Glazing Material (Not for Doors or Locations Requiring Safety Glazing): Proprietary product in the form of clear flat sheets of 3/16-inch nominal (5.0 mm) thickness weighing 2.5 lb/sq. ft. and as follows:
 - 1. Fire-Protection Rating: As indicated for the fire window in which glazing material is installed, and permanently labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 2. Products: Subject to compliance with requirements, provide the following:
 - a. Technical Glass Products (TGP); FireLite Premium, polished both sides.
- K. Fire-Rated Laminated Ceramic Glazing Material (for Doors and Locations Requiring Safety Glazing): Category II safety glazing product in the form of 2 lites of clear ceramic glazing material laminated together to produce a laminated lite of 5/16-inch nominal (8.0 mm) thickness; polished on both surfaces; weighing 4 lb/sq. ft. and as follows:
 - 1. Fire-Protection Rating: As indicated for the assembly in which glazing material is installed, and permanently labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 2. Polished on both surfaces, transparent.
 - 3. Products: Subject to compliance with requirements, provide one of the following:
 - a. Technical Glass Products (TGP); FireLite Plus.
 - b. Safti First; Pyran Platinum L, (for maximum 90 minute-rated openings).
 - c. Vetrotech Saint-Gobain; SGG Keralite FR-L.

- L. Laminated Glass with Intumescent Interlayers (Temperature-Rise-Rated Doors): Laminated glass made from multiple plies of uncoated, clear float glass; with intumescent interlayers; complying with testing requirements in 16 CFR 1201 for Category II materials.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. InterEdge, Inc., a subsidiary of AGC Glass; Pyrobel.
 - b. Pilkington Group Limited (distributed by Technical Glass Products); PyroStop.
 - c. Vetrotech Saint-Gobain; SGG Contraflam N2 or SGG Swissflam N2.
- M. Insulating-Glass Units, General: Factory-assembled units consisting of sealed lites of glass separated by an argon-filled interspace, and complying with ASTM E2190 and with requirements specified in this Section.
 - 1. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in Part 1 "Performance Requirements" paragraph.
 - 2. Provide Kind FT (fully tempered) glass lites where safety glass is indicated.
 - Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated for insulatingglass units are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.
 - 4. Sealing System: Dual seal, with primary and secondary sealants as follows:
 - a. Manufacturer's Standard Sealants. Butyl primary and silicone secondary sealants. Secondary sealant shall cover entire spacer bar at IGU perimeter.
 - 5. Spacer Specifications: Manufacturer's standard spacer material. Spacer corners shall be bent, soldered, or welded. Keyed spacer corners will not be accepted. Spacer may have a mid-span spacer key located at the midpoint of the insulating glass unit head. Where a mid-span spacer key is used, the key must be fully embedded (all sides) in butyl sealant.
- N. Ceramic-Coated Spandrel Glass: ASTM C 1048, Condition B, Type I, Quality-Q3, and complying with other requirements specified.
 - 1. Glass: Clear float.
 - 2. Ceramic Coating Color: Custom color as selected by the Architect.
- O. Silicone-Coated Spandrel Glass: ASTM C 1048, Condition C, Type I, Quality-Q3, and complying with other requirements specified.
 - 1. Products: Subject to compliance with requirements, provide ICD High Performance Coatings, Opaci-Coat 300; color as selected by Architect from manufacturer's full range.
- P. Glass Mirrors, General: ASTM C 1503; manufactured using copper-free, low-lead mirror coating process.
 - 1. Mirror Edge Treatment: Flat polished edge.
- Q. Glazing Film: Translucent, dimensionally stable, cast PVC film, 2-mil-minimum thickness, with pressure-sensitive, clear adhesive back for adhering to glass and releasable protective backing.

- 1. Manufacturers: Subject to compliance with requirements, available manufacturer's that may be incorporated into the Work include, but are not limited to, the following:
 - a. Avery Dennison, Graphics.
 - b. FDC Graphic Films, Inc.
 - c. Madico, Inc.
 - d. 3M Scotchcal.
- 2. Comply with requirements for safety glazing.
- 3. Use: Suitable for exterior and interior applications.
- 4. Patterns: As selected by Architect from manufacturer's full range.

2.3 GLAZING SEALANTS

- A. General: Provide products of type indicated, complying with the following requirements:
 - Compatibility: Verify glazing sealants that are compatible with one another and with other
 materials they will contact, including glass products, seals of insulating-glass units,
 interlayer of laminated glass, and glazing channel substrates, under conditions of service
 and application, as demonstrated by sealant manufacturer based on testing and field
 experience.
 - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 - 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
 - 4. VOC Emissions: Provide sealants in compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - 5. VOC Content:
 - a. Structural Glazing Adhesives: 100 g/L.
 - b. Architectural Sealants: 250 g/L.
 - 6. Methylene chloride and perchloroethylene may not be intentionally added to sealants.
- B. Elastomeric Glazing 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. Single-Component Neutral- and Basic-Curing Silicone Glazing Sealants:
 - a. Dow Corning Corporation; 790.
 - b. GE Silicones: SilPruf LM SCS2700.
 - c. Tremco Inc.; Spectrem 1.
- C. Glazing Sealants for Fire-Resistive Glazing Products: Identical to products used in test assemblies to obtain fire-protection rating.

2.4 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based elastomeric tape with a solids content of 100 percent; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 800 for project conditions.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; packaged on rolls with release liner protecting adhesive; and complying with AAMA 800 for the following types:
 - 1. Type 1, for glazing applications in which tape acts as the primary sealant.
 - 2. Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.5 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore, Type A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Perimeter Insulation for Fire-Resistive Glazing: Identical to product used in test assembly to obtain fire-resistance rating.
- G. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors and certified by both mirror manufacturer and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.
 - VOC Emissions: Provide adhesives in compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - 2. VOC Content: 250 g/L or less.
 - 3. Methylene chloride and perchloroethylene may not be intentionally added to adhesives.
 - 4. Do not use adhesives that contain urea formaldehyde.
- H. Mirror Hardware, Top and Bottom Aluminum J-Channels: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover bottom and top edges of each mirror in a single piece.

2.6 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with outdoor and indoor faces.
- C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing glazing, with Installer present, for compliance with the following:
 - Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep system.
 - 3. Minimum required face or edge clearances.
 - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where length plus width is larger than 50 inches as follows:
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- J. Wall-Mounted Mirrors: Install mirrors with mastic and mirror hardware. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors.
- K. Glazing Film: Apply squarely aligned to glass edges, uniformly smooth, and free from tears, air bubbles, wrinkles, and rough edges, in single sheet completely overlaying the back face of clean glass, according to manufacturer's written instructions, including surface preparation and application temperature limitations.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until just before each glazing unit is installed.
- F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

3.5 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.6 CLEANING AND PROTECTION

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

END OF SECTION

SECTION 089000

LOUVERS AND VENTS

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. Fixed. extruded-aluminum louvers.
 - 2. Wall vents.

1.3 DEFINITIONS

- A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
- B. Horizontal Louver: Louver with horizontal blades; i.e., the axes of the blades are horizontal.
- C. Vertical Louver: Louver with vertical blades; i.e., the axes of the blades are vertical.
- D. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.
- E. Storm-Resistant Louver: Louver that provides specified wind-driven rain performance, as determined by testing according to AMCA 500-L.

1.4 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes, without buckling, opening of joints, overstressing of components, failure of connections, or other detrimental effects.
- B. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
 - 1. Show weep paths, gaskets, flashing, sealant, and other means of preventing water intrusion.
 - 2. Show mullion profiles and locations.
 - 3. Wiring Diagrams: For power, signal, and control wiring for motorized adjustable louvers.

- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For each type of metal finish required.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed according to AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver and showing compliance with performance requirements specified.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain louvers and vents from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.
- B. Welding: Qualify procedures and personnel according to the following:
 - AWS D1.2/D1.2M, "Structural Welding Code Aluminum."
 - 2. AWS D1.3, "Structural Welding Code Sheet Steel."
 - AWS D1.6, "Structural Welding Code Stainless Steel."
- C. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.
- D. UL and NEMA Compliance: Provide motors and related components for motoroperated louvers that are listed and labeled by UL and comply with applicable NEMA standards.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5.
- B. Fasteners: Use types and sizes to suit unit installation conditions.
 - Use hex-head or Phillips pan-head screws for exposed fasteners unless otherwise indicated.
 - 2. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.
 - 3. For color-finished louvers, use fasteners with heads that match color of louvers.
- C. Post-installed Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, made from stainless-steel components, with capability to sustain, without failure, a load equal to 4 times the loads imposed, for concrete, or 6 times the load imposed, for masonry, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

2.2 FABRICATION, GENERAL

- A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.
- C. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
- D. Include supports, anchorages, and accessories required for complete assembly.

- E. Provide vertical mullions of type and at spacings indicated, but not more than recommended by manufacturer, or 72 inches o.c., whichever is less.
 - 1. Fully Recessed Mullions: Where indicated, provide mullions fully recessed behind louver blades. Where length of louver exceeds fabrication and handling limitations, fabricate with close-fitting blade splices designed to permit expansion and contraction.
 - Semirecessed Mullions: Where indicated, provide mullions partly recessed behind louver blades so louver blades appear continuous. Where length of louver exceeds fabrication and handling limitations, fabricate with interlocking split mullions and close-fitting blade splices designed to permit expansion and contraction.
 - 3. Exposed Mullions: Where indicated, provide units with exposed mullions of same width and depth as louver frame. Where length of louver exceeds fabrication and handling limitations, provide interlocking split mullions designed to permit expansion and contraction.
 - 4. Exterior Corners: Prefabricated corner units with mitered and welded blades or blades with concealed close-fitting splices and with fully recessed or semirecessed mullions at corners.
- F. Provide subsills made of same material as louvers or extended sills for recessed louvers.
- G. Join frame members to each other and to fixed louver blades with fillet welds, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.3 FIXED. EXTRUDED-ALUMINUM LOUVERS

- A. Horizontal. Drainable-Blade Louver:
 - 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. Arrow United Industries; a division of Mestek, Inc.
 - b. Carnes Company, Inc.
 - c. Greenheck Fan Corporation.
 - d. Ruskin Company; Tomkins PLC.
 - e. United Enertech Corp.
 - 2. Louver Depth: 4 inches.
 - 3. Frame and Blade Nominal Thickness: Not less than 0.081 inchfor blades and frames.
 - 4. Mullion Type: Exposed.
 - 5. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.4 WALL VENTS (BRICK VENTS)

- A. Extruded-Aluminum Wall Vents:
 - 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. Arrow United Industries; a division of Mestek, Inc.
 - b. Carnes Company, Inc.
 - c. Greenheck Fan Corporation.
 - d. Ruskin Company; Tomkins PLC.

- e. Approved equal.
- 2. Extruded-aluminum louvers and frames, not less than 0.125-inch nominal thickness, assembled by welding; with 18-by-14-mesh, aluminum insect screening on inside face; incorporating weep holes, continuous drip at sill, and integral waterstop on inside edge of sill; of load-bearing design and construction.
- 3. Dampers: Aluminum blades and frames mounted on inside of wall vents; operated from exterior with Allen wrench in socket-head cap screw. Fabricate operating mechanism from Type 304 stainless steel components.
- 4. Finish: Refer to schedule on drawings.

2.5 LOUVER SCREENS

- A. General: Provide screen at each exterior louver.
 - 1. Screen Location for Fixed Louvers: Interior face.
 - 2. Screening Type: Bird screening.
- B. Secure screen frames to louver frames with stainless-steel machine screws or machine screws with heads finished to match louver, spaced a maximum of 6 inches from each corner and at 12 inches o.c.
- C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.
 - 1. Metal: Same kind and form of metal as indicated for louver to which screens are attached.
 - 2. Finish: Same finish as louver frames to which louver screens are attached.
 - 3. Type: Non-rewirable, U-shaped frames.
- D. Louver Screening for Aluminum Louvers:
 - 1. Bird Screening: Aluminum, 3/4-inch-square mesh, 0.051-inchwire.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

2.7 ALUMINUM FINISHES

- A. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.3 INSTALLATION

A. Install according to manufacturer's written instructions.

- B. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work.
- C. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection
- D. Form closely fitted joints with exposed connections accurately located and secured.
- E. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- F. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.
- G. Protect unpainted galvanized and nonferrous-metal surfaces that will be in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.
- H. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Division 07 Section "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

- A. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.
- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Restore louvers and vents damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.
 - 1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 089000

SECTION 092110 - GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Interior gypsum wallboard.
 - 2. Tile backing panels.
 - 3. Acoustic insulation (sound attenuation batts) in gypsum wallboard assemblies.
 - 4. Non-load-bearing steel framing, including angles in partial-height partitions.
 - 5. Installation of access panels.
 - 6. Marking and identification for fire- and smoke-partitions.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 054000 COLD-FORMED METAL FRAMING for load-bearing steel framing.
 - 2. Section 061000 ROUGH CARPENTRY for plywood backing panels.
 - 3. Section 061600 SHEATHING for gypsum sheathing at exterior assemblies.
 - Section 083110 ACCESS DOORS AND FRAMES for furnishing access doors and frames in gypsum board assemblies.
 - 5. Section 092120 GYPSUM BOARD SHAFT WALL ASSEMBLIES for framing, gypsum panels, other components of shaft wall assemblies, and finishing gypsum board shaft wall assemblies.
 - 6. Section 093000 TILING for joint compound at cementitious tile backing panels.

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance:

- 1. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure.
- 2. Provide metal framing engineered to meet code requirements, project requirements, required heights, and the following deflection criteria. For gypsum board assemblies without applied rigid finishes L/240; for gypsum board assemblies with applied rigid finishes such as tile, stone, wood paneling L/360. Lateral load 5 psf except at shafts. Lateral load at shafts shall be required based on analysis of equipment and systems using shafts.
- 3. Provide fire stop tracks capable of withstanding deflection within limits and under conditions indicated.

- B. Marking and Identification for Fire- and Smoke-Partitions: Fire walls, fire barriers, fire partitions, smoke barriers, smoke partitions and other walls required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:
 - 1. Be located in accessible concealed floor, floor-ceiling or attic spaces; and
 - 2. Locate within 15 feet of end of each wall and repeat at intervals not exceeding 30 feet measured horizontally along the wall or partition; and
 - 3. Include lettering not less than 3 inches in height with a minimum 3/8 inch stroke in contrasting color, incorporating the suggested wording: "FIRE AND/OR SMOKE BARRIER PROTECT ALL OPENINGS," or other wording.
 - 4. Exception: Walls in Group R-2 occupancies that do not have a removable decorative ceiling allowing access to the concealed space.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: If materials and systems other than those specified and those indicated on the Drawings are proposed for use, submit shop drawings signed and sealed by a structural engineer licensed in the jurisdiction of the project certifying proposed systems meet code and project requirements. and specified deflection criteria.
- C. Samples: Full-size Sample in 12-inch-long length for each trim accessory indicated.

1.5 QUALITY ASSURANCE

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
- C. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft. in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Install mockups for the following:
 - a. Each level of gypsum board finish indicated for use in exposed locations.
 - b. Each texture finish indicated.
 - 2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
 - 3. Simulate finished lighting conditions for review of mockups.
 - 4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install interior products until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 NON-LOAD-BEARING STEEL FRAMING, GENERAL

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 - Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
 - 2. Protective Coating: Manufacturer's standard corrosion-resistant zinc coating, unless otherwise indicated.
 - 3. Recycled Content: Use minimum recycled content of 25%.

2.2 SUSPENSION SYSTEM COMPONENTS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch-diameter wire, or double strand of 0.0475-inch-diameter wire.
- B. Hanger Attachments to Concrete:
 - Anchors: Fabricated from corrosion-resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as determined by testing according to ASTM E 488 by an independent testing agency.
 - a. Type: Postinstalled, expansion anchor.
- C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.162-inch diameter.

- D. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch and minimum 1/2-inch-wide flanges with depth as required for span and loading and indicated on Drawings.
- E. Furring Channels (Furring Members): 0.0538-inch bare-steel thickness, with minimum 1/2-inchwide flanges, 3/4 inch deep.
- F. Grid Suspension System for Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Armstrong World Industries, Inc.; Drywall Grid Systems.
 - b. Chicago Metallic Corporation; Drywall Furring System.
 - c. USG Corporation; Drywall Suspension System.
 - 2. Performance Requirements: Ceiling support system shall support a live load of 6 psf minimum at L/240.

2.3 STEEL FRAMING FOR FRAMED ASSEMBLIES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. California Expanded Metals Co. (CEMCO).
 - 2. EB Metal U.S.
 - Marino\WARE.
 - 4. Studco Building Systems.
- B. Steel Studs and Runners: ASTM C 645.
 - 1. Minimum Base-Steel (Uncoated) Thickness: 0.0296 inches (20 gage).
- C. Slip-Type Head Joints: Where indicated, provide one of the following:
 - Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
 - 2. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch-deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
 - 3. Deflection Track / Deflection Clip: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
 - a. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Brady Innovations; Sliptrack Systems.
 - 2) California Expanded Metals Co. (CEMCO); CST Slotted Tracks.

- 3) Clark Dietrich Building Systems; MaxTrak Slotted Deflection Track.
- 4) Steel Network Inc. (The); VertiTrack VT Series.
- D. Fire Stop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness compatible with studs and in width to accommodate depth of studs.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - California Expanded Metals Co. (CEMCO); FAS-TRK 1000 Slotted Tracks.
 - b. Clark Dietrich Building Systems; BlazeFrame Fire Stop Deflection Track.
 - c. Fire Trak Corp.; Fire Trak attached to studs with Fire Trak Slip Clip.
 - d. GCPAT; FlameSafe FlowTrack System.
- E. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base-Metal Thickness: 0.0312 inch (20 gauge).
- F. Cold-Rolled Channel Bridging: 0.0538-inch bare-steel thickness, with minimum 1/2-inch- wide flanges.
 - 1. Depth: 1-1/2 inches.
 - 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch-thick, galvanized steel.
- G. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
 - 1. Minimum Base-Metal Thickness: 0.0312 inch (20 gauge).
 - 2. Depth: 1-1/2 inches.
- H. Resilient Furring Channels: 1/2-inch-deep, steel sheet members designed to reduce sound transmission. Strictly comply with manufacturer's installation instruction.
 - 1. Basis-of-Design: ClarkDietrich RC Deluxe, asymmetrical configuration.
- I. Resilient Sound Isolation Clips: Provide galvanized steel and resilient material sound-isolation clips, equal to the following:
 - 1. Kinetics Noise Control Co.; IsoMax.
 - 2. PAC International, Inc.; RSIC-1.
 - 3. Pliteg, Inc.; GenieClip.
 - Studco Building Systems; Resilmount A237R.
- J. Spring Isolation Hangers: Provide galvanized and coated spring hanger system, equal to the following:
 - 1. Kinetics Noise Control Co.; ICW for wood framing, ICC for metal framing.
 - 2. PAC International, Inc.; RSIC--SI-CRC Pro Series.
- K. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches wall attachment flange of 7/8 inch, minimum bare-metal thickness of 0.0179 inch, and depth required to fit insulation thickness indicated.

- L. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- M. Isolation Strip at Exterior Walls: Adhesive-backed, closed-cell foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

2.4 INTERIOR GYPSUM BOARD

- 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:
 - CertainTeed Gypsum, Inc.
 - 2. Georgia-Pacific (G-P) Gypsum.
 - 3. National Gypsum Company.
 - 4. United States Gypsum Company (USG).
- B. Gypsum Wallboard: ASTM C 1396.
 - 1. Available Products: USG; SHEETROCK EcoSmart Panels.
 - 2. Thickness: 1/2 inch and 5/8 inch as indicated.
 - 3. Long Edges: Tapered.
 - 4. Building Product Disclosure and Optimization, Environmental Product Declarations (EPD): Type III EPD.
 - 5. Low-Emitting Materials, General Emissions Evaluation: GreenGuard Gold certification.
- C. Gypsum Wallboard, Fire-Resistant Type X: ASTM C 1396.
 - 1. Available Products: USG; SHEETROCK EcoSmart Panels Firecode X.
 - 2. Thickness: 5/8 inch.
 - 3. Long Edges: Tapered.
 - 4. Building Product Disclosure and Optimization, Environmental Product Declarations (EPD): Type III EPD.
 - 5. Building Product Disclosure and Optimization, Material Ingredients: Health Product Declaration (HPD) or Declare product labels.
 - 6. Low-Emitting Materials, General Emissions Evaluation: GreenGuard Gold certification.
- D. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396. With moisture- and mold-resistant core and paper surfaces.
 - 1. Core: 5/8 inch, Type X.
 - 2. Long Edges: Tapered.
 - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
 - 4. Building Product Disclosure and Optimization, Environmental Product Declarations (EPD): Type III EPD.
 - 5. Building Product Disclosure and Optimization, Material Ingredients: Declare product labels.
 - 6. Low-Emitting Materials, General Emissions Evaluation: GreenGuard Gold certification.
- E. Abuse-Resistant Gypsum Panels: ASTM C 1629. Manufactured to produce greater resistance to surface indentation and through-penetration (impact resistance) than standard, regular-type and Type X gypsum board; 5/8 inch, Type X, long edges tapered.

F. Impact-Resistant Gypsum Wallboard, Level 2: Sheetrock Brand Mold Tough VHI Firecode X by USG, ToughRock Fireguard X Mold-Guard Abuse-Resistant Gypsum Board by Georgia-Pacific, or Gold Bond Hi-Impact XP Gypsum Board by National Gypsum.

2.5 TILE BACKING PANELS

- A. Cementitious Tile Backing Units: ANSI A118.9 and ASTM C 1288 or 1325, with manufacturer's standard edges.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Custom Building Products; Wonderboard and Wonderboard Lite.
 - b. FinPan, Inc.; Util-A-Crete Concrete Backer Board.
 - c. National Gypsum Company; Permabase Cement Board.
 - d. USG Corporation; DUROCK Cement Board.
 - 2. Thickness: 5/8 inch.
 - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.6 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 - 1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc, with flanges for mechanical fastening, unless otherwise indicated.
 - 2. Shapes:
 - a. Cornerbead.
 - b. Bullnose bead.
 - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - d. Expansion (control) joint. For control joints in fire rated walls provide Cemco FAS 093X fire-rated control joint or equal.
 - e. Curved-Edge Cornerbead: With notched or flexible flanges.
- B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.
 - 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. Fry Reglet Corp.
 - b. Gordon, Inc.
 - c. Pittcon Industries.
 - 2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221, Alloy 6063-T5.
 - 3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

2.7 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

- 1. Interior Gypsum Wallboard: Paper.
- 2. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - 3. Fill Coat: For second coat, use setting-type, sandable topping compound.
 - 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
 - 5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.
- D. Joint Compound for Tile Backing Panels:
 - 1. Cementitious Backing Units: Thinset, nonsag mortar, as recommended by backing unit manufacturer. Refer to Section 093000 TILING.
 - 2. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2.8 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
 - 1. Low-Emitting Materials: Provide adhesives in compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - 2. VOC Content: 50 g/L or less.
 - 3. Methylene chloride and perchloroethylene may not be intentionally added to adhesives.
 - 4. Do not use adhesives that contain urea formaldehyde.
- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 - Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
 - 2. For fastening cementitious tile backing units, use screws of type and size recommended by panel manufacturer.
 - 3. For fastening abuse-resistant gypsum panels, use Type S 'high-low' screws.
 - 4. For fastening impact-resistant gypsum panels, use Type S 'high-low' screws.
- D. Acoustic Insulation, Sound Attenuation (Batts) Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

- 1. Available Products: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed Corporation; NoiseReducer.
 - b. Johns Manville; Unfaced Formaldehyde-Free Fiber Glass Insulation.
 - c. Knauf Insulation; EcoBatt.
 - d. Owens Corning; PINK Next Gen Fiberglass Sound Attenuation Batts (SAB).
 - e. Owens Corning; Thermafiber SAFB FF.
 - f. Rockwool (formerly Roxul); AFB evo.
- 2. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
- 3. Building Product Disclosure and Optimization, Environmental Product Declarations (EPD).
- 4. Recycled Content: Use minimum recycled content of 25%.
- 5. Building Product Disclosure and Optimization, Material Ingredients: Health Product Declaration (HPD) or Declare product labels.
- 6. Low-Emitting Materials, General Emissions Evaluation: GreenGuard Gold certification.
- E. Acoustical Sealant: Manufacturer's standard nondrying, nonhardening, nonskinning, nonstaining, gunnable, joint sealant, recommended for sealing interior concealed joints to reduce airborne sound transmission.
 - 1. Available Products, for Concealed and Exposed Joints: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
 - b. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant.
 - c. USG; SHEETROCK Acoustical Sealant.
 - 2. Available Products, for Concealed Joints Only: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. OSI (a division of Henkel); Pro-Series SC-175.
 - b. Pecora Corp.; BA-98.
 - c. Tremco, Inc.; Tremco Acoustical/Curtainwall Sealant.
 - 3. Low-Emitting Materials: Provide sealants in compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - 4. VOC Content, Architectural Sealants: 250 g/L or less.
 - 5. Methylene chloride and perchloroethylene may not be intentionally added to sealants.

2.9 IDENTIFICATION LABELS FOR FIRE- AND SMOKE-PARTITIONS

- A. Identification Labels: Self-adhesive signs, to comply with applicable local Code.
 - 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. Fire Wall Signs, Inc.
- b. Marking & Identification Tape.
- c. My Safety Sign.
- d. Safety Supply Warehouse.
- 2. Text: "FIRE AND SMOKE BARRIER PROTECT ALL OPENINGS".

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
 - 1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.
- B. Coordination with Sprayed Fire-Resistive Materials:
 - 1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches o.c.
 - 2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754. Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.

D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components in sizes and spacings indicated on Drawings, but not less than those required by referenced installation standards for assembly types and other assembly components indicated.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
 - 3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 - 4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 - 5. Do not attach hangers to steel roof deck.
 - 6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
 - 7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 - 8. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Seismic Bracing: Sway-brace suspension systems with hangers used for support.
- F. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- G. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.5 INSTALLING FRAMED ASSEMBLIES

- A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- B. Install studs so flanges within framing system point in same direction.
- C. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
 - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on doorframes; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb, unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
 - Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 - 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 - 4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
 - 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
 - 6. Curved Partitions:
 - a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
 - b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of not less than 2 studs at ends of arcs, place studs 6 inches o.c.
- D. Direct Furring: Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

E. Z-Furring Members:

- 1. Erect insulation vertically and hold in place with Z-furring members spaced 24 inches o.c.
- 2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.

3.6 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

3.7 APPLYING INTERIOR GYPSUM BOARD

- A. Single-Layer Application:
 - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels to minimize end joints.
 - 3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 - 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- B. Multilayer Application:

- On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints 1 framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistancerated assembly.
- 2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
- 3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
- Fastening Methods: Fasten base layers and face layers separately to supports with screws.
- C. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

D. Curved Surfaces:

- 1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus 12-inch-long straight sections at ends of curves and tangent to them.
- 2. For double-layer construction, fasten base layer to studs with screws 16 inches o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches o.c.

3.8 APPLYING TILE BACKING PANELS

- A. Cementitious Tile Backing Units: ANSI A108.1, at locations indicated to receive tile, with joints treated to comply with ANSI A108.11.
- B. Water-Resistant Backing Board: Install at areas not subject to wetting and elsewhere as indicated with 1/4-inch gap where panels abut other construction or penetrations.
- C. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.9 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:

- 1. Cornerbead: Use at outside corners, unless otherwise indicated.
- 2. LC-Bead: Use at exposed panel edges.
- 3. Curved-Edge Cornerbead: Use at curved openings.
- D. Aluminum Trim: Install in locations indicated on Drawings.

3.10 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Comply with GA-214. Finish panels to levels indicated below:
 - 1. Level 1: Ceiling plenum areas and concealed areas not exposed to view.
 - 2. Level 2: Panels that are substrate for tile.
 - 3. Level 3: Not Used.
 - 4. Level 4: Panel surfaces that will be exposed to view (typical panels).
 - 5. Level 5: Where indicated on Drawings; includes areas to receive dry erase coatings, wall graphics, and wallcoverings.
- E. Cementitious Tile Backing Units: Finish according to manufacturer's written instructions.

3.11 INSTALLING IDENTIFICATION FOR FIRE- AND SMOKE-PARTITIONS

A. Marking and Identification for Fire- and Smoke-Partitions: Permanently install as required by Code.

3.12 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, or exhibit mold growth. Repair of damaged panels in place is not acceptable.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 092120 - GYPSUM BOARD SHAFT WALL ASSEMBLIES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Gypsum board shaft wall assemblies.
 - 2. Marking and identification for fire- and smoke-partitions.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - Section 083110 ACCESS DOORS AND FRAMES for installation in gypsum board assemblies.
 - 2. Section 092110 GYPSUM BOARD ASSEMBLIES for non-shaft-wall gypsum board assemblies.
 - 3. Section 092110 GYPSUM BOARD ASSEMBLIES for applying and finishing panels in gypsum board assemblies.

1.3 DEFINITIONS

A. Gypsum Board Construction Terminology: Refer to ASTM C 11 for definitions of terms for gypsum board construction not defined in this Section or in other referenced standards.

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance:

- Provide gypsum board shaft wall assemblies capable of withstanding the full air-pressure loads indicated for maximum heights of partitions without failing and while maintaining an airtight and smoke-tight seal. Evidence of failure includes deflections exceeding limits indicated, bending stresses causing studs to break or to distort, and end-reaction shear causing track (runners) to bend or to shear and studs to become crippled.
- 2. Provide gypsum board shaft wall assemblies for horizontal duct enclosures capable of spanning distances indicated within deflection limits indicated.
- B. Marking and Identification for Fire- and Smoke-Partitions: Fire walls, fire barriers, fire partitions, smoke barriers, smoke partitions and other walls required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:

- Be located in accessible concealed floor, floor-ceiling or attic spaces; and
- 2. Locate within 15 feet of end of each wall and repeat at intervals not exceeding 30 feet measured horizontally along the wall or partition; and
- 3. Include lettering not less than 3 inches in height with a minimum 3/8 inch stroke in contrasting color, incorporating the suggested wording: "FIRE AND/OR SMOKE BARRIER PROTECT ALL OPENINGS," or other wording.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Fire-Test-Response Reports: From a qualified independent testing and inspecting agency substantiating each gypsum board shaft wall assembly's required fire-resistance rating.
 - 1. Include data substantiating that elevator entrances and other items that penetrate each gypsum board shaft wall assembly do not negate fire-resistance rating.

1.6 QUALITY ASSURANCE

- A. Fire-Resistance-Rated Assemblies: Provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
 - Fire-Resistance-Rated Assemblies: Indicated by design designations from FM's
 "Approval Guide, Building Products," UL's "Fire Resistance Directory," or ITS's "Directory
 of Listed Products."
- B. STC-Rated Assemblies: For gypsum board shaft wall assemblies indicated to have STC ratings, provide assembly materials and construction complying with requirements of assemblies whose STC ratings were determined according to ASTM E 90 and classified according to ASTM E 413 by a qualified independent testing agency.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 01. Review methods and procedures for installing work related to gypsum board shaft wall assemblies including, but not limited to, the following:
 - 1. Fasteners proposed for anchoring steel framing to building structure.
 - 2. Sprayed fire-resistive materials applied to structural framing.
 - 3. Elevator equipment, including hoistway doors, elevator call buttons, and elevator floor indicators.
 - 4. Wiring devices in shaft wall assemblies.
 - 5. Doors and other items penetrating shaft wall assemblies.
 - 6. Items supported by shaft wall-assembly framing.
 - 7. Mechanical work enclosed within shaft wall assemblies.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, and bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat on leveled supports off the ground to prevent sagging.

1.8 PROJECT CONDITIONS

A. Comply with requirements for environmental conditions, room temperatures, and ventilation specified in Section 092110 - GYPSUM BOARD ASSEMBLIES.

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:
 - CertainTeed Gypsum, Inc.
 - 2. National Gypsum Company.
 - 3. United States Gypsum Company (USG).

2.2 ASSEMBLY MATERIALS

- A. General: Provide materials and components complying with requirements of fire-resistancerated assemblies indicated.
 - 1. Provide panels in maximum lengths available to eliminate or minimize end-to-end butt joints.
 - 2. Provide auxiliary materials complying with gypsum board shaft wall assembly manufacturer's written recommendations.
- B. Steel Framing: ASTM C 645.
 - 1. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized coating.
- C. Gypsum Liner Panels: Manufacturer's proprietary liner panels in 1-inch thickness and with moisture-resistant paper faces.
- D. Gypsum Wallboard: ASTM C 1396, core type as required by fire-resistance-rated assembly indicated.
- E. Accessories: Cornerbead, edge trim, and control joints of material and shapes specified in Section 092110 GYPSUM BOARD ASSEMBLIES comply with gypsum board shaft wall assembly manufacturer's written recommendations for application indicated.
- F. Gypsum Wallboard Joint-Treatment Materials: ASTM C 475 and as specified in Section 092110 GYPSUM BOARD ASSEMBLIES.
- G. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
- H. Track (Runner) Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.
 - 1. Powder-Actuated Fasteners: Provide powder-actuated fasteners with capability to sustain, without failure, a load equal to 10 times that imposed by shaft wall assemblies,

- as determined by testing conducted by a qualified independent testing agency according to ASTM E 1190.
- 2. Postinstalled Expansion Anchors: Where indicated, provide expansion anchors with capability to sustain, without failure, a load equal to 5 times that imposed by shaft wall assemblies, as determined by testing conducted by a qualified independent testing agency according to ASTM E 488.
- I. Laminating Adhesive: Comply with requirements of Section 092110 GYPSUM BOARD ASSEMBLIES.
- J. Acoustic Insulation, Sound Attenuation (Batts) Blankets: Comply with requirements of Section 092110 GYPSUM BOARD ASSEMBLIES.
- K. Acoustical Sealant: Comply with requirements of Section 092110 GYPSUM BOARD ASSEMBLIES.

2.3 GYPSUM BOARD SHAFT WALL

- A. Basis-of-Design Product: As indicated on Drawings by design designation of a qualified testing and inspecting agency.
- B. Sustained Air-Pressure Loads: 5 lbf/sq. ft.
- C. Deflection Limit: L/240.
- D. Studs: Manufacturer's standard profile for repetitive members and corner and end members and for fire-resistance-rated assembly indicated.
 - 1. Depth: As indicated.
 - 2. Minimum Base Metal Thickness: Manufacturer's standard thicknesses that comply with structural performance requirements for stud depth indicated.
- E. Track (Runner): Manufacturer's standard J-profile track with long-leg length as standard with manufacturer, but at least 2 inches in depth matching studs.
 - 1. Minimum Base Metal Thickness: Manufacturer's standard thicknesses that comply with structural performance requirements for stud depth indicated.
- F. Jamb Struts: Manufacturer's standard J-profile strut with long-leg length of 3 inches, in depth matching studs, and not less than 0.0341 inch thick.
- G. Room-Side and Shaft-Side Finish: As indicated.
- H. STC Rating: As indicated.
- I. Cavity Insulation: Sound attenuation blankets.

2.4 IDENTIFICATION LABELS FOR FIRE- AND SMOKE-PARTITIONS

A. Identification Labels: Self-adhesive signs, to comply with applicable local Code.

- 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. Fire Wall Signs, Inc.
 - b. Marking & Identification Tape.
 - c. My Safety Sign.
 - d. Safety Supply Warehouse.
- 2. Text: "FIRE AND SMOKE BARRIER-PROTECT ALL OPENINGS"

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to which gypsum board shaft wall assemblies attach or abut, with Installer present, including hollow-metal frames, elevator hoistway doorframes, cast-in anchors, and structural framing. Examine for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Sprayed Fire-Resistive Materials: Coordinate with gypsum shaft wall assemblies so both elements of Work remain complete and undamaged. Patch or replace sprayed fire-resistive materials removed or damaged during installation of shaft wall assemblies.
- B. Coordination with Sprayed Fire-Resistive Materials:
 - 1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches o.c.
 - After sprayed fire-resistive materials are applied, remove them only to extent necessary
 for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive
 materials below that required for fire-resistance ratings indicated. Protect adjacent fireresistive materials from damage.

3.3 INSTALLATION

- A. General: Install gypsum board shaft wall assemblies to comply with requirements of fireresistance-rated assemblies indicated, manufacturer's written installation instructions, and the following:
 - 1. ASTM C 754 for installing steel framing and gypsum shaft wallboard.
- B. Do not bridge building expansion joints with shaft wall assemblies; frame both sides of joints with furring and other support.
- C. Install supplementary framing in gypsum board shaft wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment,

services, heavy trim, furnishings, and similar items that cannot be supported directly by shaft wall assembly framing.

- 1. At elevator hoistway doorframes, provide jamb struts on each side of doorframe.
- 2. Where handrails directly attach to gypsum board shaft wall assemblies, provide galvanized steel reinforcing strip with 0.0312-inch minimum thickness of base (uncoated) metal, accurately positioned and secured behind at least 1 face-layer panel.
- D. Integrate stair hanger rods with gypsum board shaft wall assemblies by locating cavity of assemblies where required to enclose rods.
- E. At penetrations in shaft wall, maintain fire-resistance rating of shaft wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.
- F. Isolate gypsum finish panels from building structure to prevent cracking of finish panels while maintaining continuity of fire-rated construction.
- G. Install control joints to maintain fire-resistance rating of assemblies.
- H. Seal gypsum board shaft walls with acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly. Install acoustical sealant to withstand dislocation by air-pressure differential between shaft and external spaces; maintain an airtight and smoke-tight seal; and comply with manufacturer's written instructions or ASTM C 919, whichever is more stringent.

3.4 FINISHING GYPSUM BOARD SHAFT WALL ASSEMBLIES

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below:
 - 1. Level 1: Ceiling plenum areas and concealed areas not exposed to view.
 - 2. Level 2: Panels that are substrate for tile.
 - 3. Level 4: Panel surfaces that will be exposed to view (typical panels).
 - 4. Level 5: Where indicated on Drawings.

3.5 INSTALLING IDENTIFICATION FOR FIRE- AND SMOKE-PARTITIONS

A. Marking and Identification for Fire- and Smoke-Partitions: Permanently install as required by Code.

3.6 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, or exhibit mold growth. Repair of damaged panels in place is not acceptable.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 093000 - TILING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Floor, wall, and base tiles.
 - 2. Setting materials and accessories.
 - 3. Surface preparation.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 079200 JOINT SEALANTS for sealing of movement joints in tile surfaces.
 - 2. Section 083110 ACCESS DOORS AND FRAMES for installation in tile.
 - 3. Section 092110 GYPSUM BOARD ASSEMBLIES for tile backing panels.

1.3 DEFINITIONS

- A. General: Definitions in ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. Face Size: Actual tile size, excluding spacer lugs.
- C. Large Format Tile: Tile with at least one edge 15 inches or longer.
- D. Module Size: Actual tile size plus joint width indicated.

1.4 PERFORMANCE REQUIREMENTS

- A. Wet Dynamic Coefficient of Friction: For flooring exposed as a walking surface, provide products with the following values as determined by testing identical products per ANSI/NFSI B101.3 2012 Test Method for Measuring Wet DCOF of Common Hard-Surface Floor Materials, or ANSI 326.3 American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Materials 2017. Testing by other methods or earlier editions of the specified test method is not acceptable.
 - 1. Wet Dynamic Coefficient of Friction: Not less than 0.43.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of movement joints in tile substrates and finished tile surfaces.
 - 1. For feature spaces including lobbies, reception areas, corridors, and similar, include layout drawings based on field measurements.
- C. Samples for Verification:
 - 1. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required. Make samples at least 12 inches square, but not fewer than four tiles. Use grout of type and in color or colors approved for completed work.
 - 2. Full-size units of each type of trim and accessory for each color and finish required.
 - 3. Stone Thresholds: 6-inch lengths.
 - 4. Metal Edge Strips: 6-inch lengths.
- D. Qualification Data: For Installer.
- E. Product Test Reports: For each tile setting product.
 - 1. Tile-setting and -grouting products.
 - 2. Certified porcelain tile.
 - 3. Slip-resistance test reports from qualified independent testing agency.

1.6 QUALITY ASSURANCE

- A. Source Limitations for Tile: Obtain tile of same type and color or finish from one source or producer.
 - 1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting Materials: Obtain ingredients of a uniform quality for each membrane, mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section through one source from a single manufacturer for each product:
 - Stone thresholds.
 - 2. Metal edge strips.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.
 - 1. Review requirements in ANSI A108.01 for substrate flatness and for preparation by other trades.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.

- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Store liquid additives in unopened containers and protected from freezing.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

1.9 WARRANTY

- A. Tiling Contractor's Warranty: The tiling subcontractor shall supply Owner with a minimum two-year workmanship warranty for each tile area. In the event any work related to the tiling and setting materials is found to be defective within two years of substantial completion, the tiling contractor shall remove and replace such at no additional cost to the Owner. The tiling subcontractor's warranty obligation shall run directly to the Owner, and a copy the tiling signed warranty shall be sent to the tiling system's manufacturer.
 - 1. The duration of the tiling subcontractor's two-year warranty shall run concurrent with the tiling system's manufacturer's 25-year warranty.
- B. Tiling Systems Manufacturer's Warranty: The tiling systems manufacturer shall guarantee installed tile areas to be in a fully bonded, uncracked, flat, and watertight condition, for a period of 5 years, from the date of final acceptance of the tiling system. The warranty shall be a 5-year no dollar limit (NDL), non-prorated total system labor and material warranty. Total system warranty shall include tiling materials, related components and accessories including, but not limited to the substrate board, waterproofing and crack isolation membranes, mortars, grouts, adhesives, transition materials, and floor drain assemblies.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide Standard-grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
 - 1. For facial dimensions of tile, comply with requirements relating to tile sizes specified in Part 1 "Definitions" Article.
 - Building Product Disclosure and Optimization, Environmental Product Declarations (EPD): Type III EPD for ceramic tiles.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

2.2 TILE PRODUCTS

A. Tile Types:

- 1. PT1: CMC; Bellissimo.
 - a. Size 12 by 24 inches.
 - b. Color: Grey 11 Mattefinish.
 - c. Location: Corridor wall tile at new addition.
- 2. PT2: CMC; Bellissimo.
 - a. Size 12 by 24 inches.
 - b. Color:
 - 1) PT2a- Terracotta 12-Polished
 - 2) PT2b-Teal13-Polished
 - 3) PT2c-Teal 12-Polished
 - c. Location: Corridor wall tile at new addition.
- 3. PTB1: CMC; Bellissimo.
 - a. Size 12 by 24 inches; cut to 6 inches height. Polished.
 - b. Color: Black 11.
 - c. Location: Corridor wall tile at new addition.
- 4. PTB2- Crossville, Fokos Porcelain panel
 - a. Size- 39.374" x118.11" cut for 12"h base
 - b. Color: Sale L3914-5.6
- 5. PT3: Marazzi, Moroccan Concrete
 - a. Size: Hexagon- 8x9 x 1/4"
 - b. Color: 3a- Off White MC50, 3b-Blue Grey MC54, 3c-Terracotta MC56
 - c. Location: Multiuser toilet roomsfloor.
- 6. PT4: Daltile; Outlander.
 - a. Size 12 by 24 inches.
 - b. Color: Sterling 0057.
 - c. Location: Single user toilet floors at Early Education.
- 7. PT5: Wayne Tile Company; Colori.
 - a. Size 6 inch hex.x 9mm
 - b. Color: Latte, 5A; Blu, 5B; Glicene, 5C.
 - c. Location: Single user toilet floors (**not** at early education)
- 8. PT6: Crossville; Laminam Collection.
 - a. Size: 1 by 3 meter panel #L0102.
 - b. Color: Neve.
 - c. Location: Wall tile at lobby.

- PT7: Crossville; Porcelain tile panel Fokos -L4489. 9.
 - Size: 1 by 3 meter panel. Cut as a base tile. Color: Sale.
 - b.
 - Location: Wall tile base at lobby C.

- 10. CT1: Daltile; Farrier.
 - a. Size 2.5 by 15 by 5/16 inch.
 - b. Color: Cremello FA55
 - c. Location- Multi-User toilet room walls
- 11. CT2A: Daltile; Artcrafted.
 - a. Size 1 by 6 by 5/16 inches, mosaic.
 - b. Color: 2A-Tide AC29.
 - c. Location: Multiuser toilet walls Accent.
- 12. CT2B: Daltile; Artcrafted.
 - a. Size 1 by 6 by 5/16 inches, mosaic.
 - b. Color: 2B-Aloe AC25.
 - c. Location: Multiuser toilet walls Accent.
- 13. CT2C: Daltile; Artcrafted.
 - a. Size 1 by 6 by 5/16 inches, mosaic.
 - b. Color: 2C-Cotto- AC27.
 - c. Location: Multiuser toilet walls Accent.
- 14. CT2D: Daltile; Artcrafted.
 - a. Size 1 by 6 by 5/16 inches, mosaic.
 - b. Color: 2D-Dune AC24.
 - c. Location: Multiuser toilet walls Accent.
- 15. CT3: Creative Materials Corporation; Zest.
 - a. Size: 3 by 12 inches by 10 mm.
 - b. Color: Field White.
 - c. Location: Single User toilet walls at Early Education.
- 16. CT4: Creative Materials Corporation; Zest.
 - a. Size: 3 by 12 inches by 10 mm.
 - b. Color: 4A, blue; 4B, green.
 - c. Location: Single User toilet walls at Early Education.
- 17. CT5: Creative Materials Corporation; Zest, Gradient (full collection)
 - a. Size: 3 by 12 inches by 10 mm.
 - b. Color: 5A, blue; 5B, green.
 - c. Location: Single User toilet walls at Early Education.
- 18. CT6: Creative Materials Corporation; Zest, Circles
 - a. Size: 3 by 12 inches by 10 mm.
 - b. Color: 6A, blue; 6B, green.
 - c. Location: Single User toilet walls at Early Education.

- 19. CT7: Wayne Tile, Colori
 - a. Size: 3 by 11 inches.
 - b. Color: 7a- Latte, 7b- Blu- 7c-Glicene.
 - c. Location: Single User toilet walls (**not** at Early Education)
- B. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- C. Mounting: For factory-mounted tile, provide back-or edge-mounted tile assemblies as standard with manufacturer, unless otherwise indicated.
- D. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes selected from manufacturer's standard shapes.

2.3 THRESHOLDS AND EDGE STRIPS

- A. Thresholds: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
 - 1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to 1/16 inch above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to 1/2 inch or less above adjacent floor surface.
- B. Marble Thresholds: ASTM C 503/C 503M, with a minimum abrasion resistance of 10 according to ASTM C 1353 or ASTM C 241/C 241M and with honed finish.
 - 1. Description: Uniform, fine-to medium-grained white stone with gray veining.
- C. Metal Edge Strips and Flooring Transitions: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and resilient base, designed specifically for flooring applications.
 - 1. Basis of Design: Schluter Systems; Jolly including pieces for a complete installation.
 - a. Top of tile and outside corners of tile.
 - b. Material: ASTM A 666, stainless steel, 300 series, with No. 4 satin finish.

2.4 SETTING MATERIALS

- 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. Custom Building Products.
 - 2. Laticrete International, Inc.
 - 3. MAPEI Corporation.
- B. Trowelable Underlayments and Patching Compounds, for Concrete Substrates: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

- C. Waterproofing and Crack Isolation Membrane: Manufacturer's standard product, that complies with ANSI A118.10 and ANSI A118.12 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- D. Fabric-Reinforced, Fluid-Applied Waterproofing and Crack Isolation Membrane: System consisting of liquid-latex rubber or elastomeric polymer and continuous fabric reinforcement.
 - 1. Available Products: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Custom Building Products; 9240 Waterproofing and Anti-Fracture Membrane.
 - b. Laticrete; Hydro Ban.
 - c. MAPEI; Mapelastic AquaDefense.
 - 2. Building Product Disclosure and Optimization, Material Ingredients: Health Product Declaration (HPD) or Declare product labels.
 - 3. Low-Emitting Materials, General Emissions Evaluation: Provide membranes in compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - a. VOC Content, Waterproofing Sealer: 100 g/L or less.
 - b. GreenGuard Gold certification.
- E. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.
 - 1. Cleavage Membrane: Asphalt felt, ASTM D 226, Type I (No. 15); or polyethylene sheeting, ASTM D 4397, 4.0 mils thick.
 - 2. Building Product Disclosure and Optimization, Environmental Product Declarations (EPD): Type III EPD for mortar.
- F. Modified Dry-Set (formerly Latex-Portland Cement) Mortar (Thinset): ANSI A118.4.
 - 1. For Exterior Glue Plywood (EGP) Modified Dry-Set Mortar, comply with ANSI A118.11.
 - 2. For Large and Heavy Tile, Improved Modified Dry-Set Mortars, comply with ANSI A118.15.
 - 3. Provide prepackaged, dry-mortar mix containing dry, redispersible, acrylic additive to which only water must be added at Project site.
 - 4. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to other requirements in ANSI A118.4.
 - 5. Building Product Disclosure and Optimization, Environmental Product Declarations (EPD): Type III EPD for mortar.
- G. Medium-Bed, Latex-Portland Cement Mortar: Provide materials composed as follows, with physical properties equaling or exceeding those required for thin-set mortars based on testing of medium-bed specimens according to ANSI A118.4:
 - 1. Prepackaged dry-mortar mix containing dry, redispersible, ethylene vinyl acetate additive to which only water must be added at Project site.
 - 2. Prepackaged dry-mortar mix combined with liquid-latex additive.
 - 3. Product: Laticrete 220 Medium Bed Mortar with 333 Superflex, or approved equal.

- H. Mesh Tape for Tile Backing Panels: Alkali-resistant type, as recommended by panel manufacturer.
- I. Tile Grout, Cementitious Type: ANSI A118.7, liquid-latex form for addition to prepackaged dry-grout mix.
 - 1. Available Products: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Custom Building Products; Polyblend.
 - b. Laticrete; Permacolor Select.
 - c. MAPEI; Keracolor.
 - 2. Cementitious Grout Types:
 - a. Unsanded grout mixture for joints 1/8 inch and narrower.
 - b. Sanded grout mixture for joints 1/8 inch and wider.
 - 3. Color: To be selected by Architect from manufacturer's full range.
 - 4. Building Product Disclosure and Optimization, Environmental Product Declarations (EPD): Type III EPD for grout.
 - 5. Building Product Disclosure and Optimization, Material Ingredients: Health Product Declaration (HPD) or Declare product labels.
 - 6. Low-Emitting Materials, General Emissions Evaluation: Provide membranes in compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - a. VOC Content, Ceramic, Glass, Porcelain, and Stone Tile Adhesives: 65 g/L or less.
 - b. GreenGuard Gold certification.
- J. Tile Grout, Epoxy Type: ANSI A118.3, chemical resistant, water cleanable, tile grouting epoxy.
 - 1. Available Products: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Custom Building Products; CEG-IG.
 - b. Laticrete; SpectraLock Pro.
 - c. MAPEI; Kerapoxy.
 - 2. Color: To be selected by Architect from manufacturer's full range.
 - 3. Building Product Disclosure and Optimization, Material Ingredients: Health Product Declaration (HPD) or Declare product labels.
 - 4. Low-Emitting Materials, General Emissions Evaluation: Provide membranes in compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - a. VOC Content, Ceramic, Glass, Porcelain, and Stone Tile Adhesives: 65 g/L or less.

- b. GreenGuard Gold certification.
- K. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- L. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints that does not change color or appearance of grout.
 - 1. Low-Emitting Materials, General Emissions Evaluation: Provide membranes in compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - a. VOC Content, Tile and Stone Sealers: 100 g/L or less.
 - b. GreenGuard Gold certification.

2.5 ELASTOMERIC SEALANTS

- A. Joint Sealants: Refer to Section 079200 JOINT SEALANTS.
- B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints, unless otherwise indicated.

2.6 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
 - 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
 - 3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.
- B. Provide concrete substrates for tile floors that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.
 - 1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
 - 2. Remove protrusions, bumps, and ridges by sanding or grinding.
- C. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.
- D. Cementitious Tile Backing Panels: Treat joints to comply with ANSI A108.11.
- E. Substrate Flatness:
 - 1. For tile shorter than 15 inches, confirm that structure or substrate is limited to variation of 1/4 inch in 10 ft. from the required plane, and no more than 1/16 inch in 12 inches when measured from tile surface high points.
 - 2. For large format tile, tile with at least one edge 15 inches or longer, confirm that structure or substrate is limited to 1/8 inch in 10 ft. from the required plane, and no more than 1/16 inch in 24 inches when measured from tile surface high points.
- F. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 TILING INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.
- B. Membrane Installation:
 - 1. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness bonded securely to substrate.
 - 2. Install crack-isolation membrane to comply ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness bonded securely to substrate.
 - 3. Do not install tile over membrane until membrane has cured and been tested to determine that it is watertight.
- C. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

- 1. Follow procedures in ANSI A108 series of tile installation standards for providing minimum percent levels of mortar coverage.
- 2. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- 3. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- D. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.
 - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
 - 2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
- E. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- F. Expansion (Movement) Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Keep joints free of dirt, debris, and setting materials prior to filling with sealants. Do not saw-cut joints after installing tiles.
 - 1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
 - 2. Prepare joints and apply sealants to comply with requirements in Section 079200 JOINT SEALANTS.
- G. Stone Thresholds: Install stone thresholds at locations indicated; set in same type of setting bed as abutting field tile, unless otherwise indicated.
 - 1. At locations where mortar bed (thickset) would otherwise be exposed above adjacent floor finishes, set thresholds in mortar (thinset).
 - 2. Do not extend membranes under thresholds set in mortar. Fill joints between such thresholds and adjoining tile set on membrane with elastomeric sealant.
- H. Metal Edge Strips and Flooring Transitions: Install at locations indicated and where exposed edge of tile flooring meets other flooring that finishes flush with top of tile and no threshold is indicated.
- I. Floor Sealer: Apply floor sealer to grout joints according to floor-sealer manufacturer's written instructions. As soon as floor sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.4 CLEANING AND PROTECTING

A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

- B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove grout residue from tile as soon as possible.
 - 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
 - 3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.
- C. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- D. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed. After seven days, cover areas subject to construction traffic with heavy cardboard.
- E. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.
- 3.5 TILE INSTALLATION SCHEDULE
 - A. This schedule refers to Tile Installation Methods specified in the TCNA Handbook.
 - B. Floor Tile Over Slab on Grade Concrete, Typical: TCNA F113 and ANSI A108.5.
 - 1. Tile Type: Refer to Finish Schedule.
 - 2. Mortar: Thinset.
 - 3. Grout: Polymer-modified unsandedgrout.
 - 4. Joint Width: 1/8 inch.
 - 5. Crack isolation membrane, at large format tile.
 - C. Floor Tile Over Concrete, at Commercial Kitchen and Servery Areas: TCNA F115 and ANSI A108.5 or ANSI A108.6.
 - 1. Tile Type: Refer to Finish Schedule.
 - 2. Mortar: Thinset.
 - 3. Grout: Epoxy.
 - Joint Width: 1/8 inch.
 - D. Floor Tile Over Elevated Slab Concrete, at Toilet Rooms: TCNA F122 and ANSI A108.5.
 - 1. Tile Type: Refer to Finish Schedule.
 - 2. Mortar: Thinset.
 - 3. Grout: Polymer-modified unsanded grout.
 - 4. Joint Width: 1/8 inch.
 - 5. Waterproofing membrane.
 - E. Floor Tile Over Wood Subflooring, at Bathrooms, Kitchens, and Toilet Rooms: TCNA F144 and ANSI A108.5.

- 1. Tile Type: Refer to Finish Schedule.
- 2. Mortar: Thinset.
- 3. Grout: Polymer-modified unsanded grout.
- 4. Joint Width: 1/8 inch.
- 5. Waterproofing membrane.
- 6. Cementitious tile backing panels.
- F. Floor Tile Over Gypsum Cement Underlayment and Wood Subflooring, at Bathrooms, Kitchens, and Toilet Rooms: TCNA F185 and ANSI A108.5.
 - 1. Tile Type: Refer to Finish Schedule.
 - 2. Mortar: Thinset.
 - 3. Grout: Polymer-modified unsanded grout.
 - 4. Joint Width: 1/8 inch.
 - 5. Waterproofing membrane.
- G. Wall Tile, Typical Over Cementitious Tile Backing Panels: TCNA W244C and ANSI A108.5.
 - 1. Tile Type: Refer to Finish Schedule.
 - 2. Mortar: Thinset.
 - 3. Grout: Polymer-modified unsanded grout.
 - 4. Joint Width: 1/8 inch.
- H. Wall Tile Over Cementitious Tile Backing Panels, at Bathtubs and Showers: TCNA B420 and ANSI A108.5.
 - 1. Tile Type: Refer to Finish Schedule.
 - 2. Mortar: Thinset.
 - 3. Grout: Polymer-modified unsanded grout.
 - 4. Joint Width: 1/8 inch.
 - 5. Waterproofing membrane.

END OF SECTION

SECTION 095100 - ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Acoustical ceiling tiles and panels.
 - 2. Suspension systems, grid systems and ceiling hangers.
 - 3. Acoustical sealant at edge moldings at acoustical ceilings.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 092110 GYPSUM BOARD ASSEMBLIES for gypsum board ceilings and soffits.
 - 2. Division 21 FIRE SUPPRESSION for fire-suppression components located in ceilings.
 - 3. Division 23 HEATING, VENTILATING AND AIR CONDITIONING for air handling and distribution components located in ceilings.
 - 4. Division 26 ELECTRICAL for light fixture and alarm system components located in ceilings.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:
 - 1. Ceiling suspension members.
 - 2. Method of attaching hangers to building structure. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
 - 3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
 - 4. Minimum Drawing Scale: 1/4 inch = 1 foot.
- C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
 - 1. Acoustical Panel: Set of 6 inch square Samples of each type, color, pattern, and texture.
 - 2. Exposed Suspension System Members, Moldings, and Trim: Set of 12 inch long Samples of each type, finish, and color.

- D. Asbestos Certification: Manufacturer's written certification that acoustical ceiling products contain no asbestos (0.0000%). Product labels indicating that it is the user's responsibility to test the products for asbestos are unacceptable and sufficient cause for rejection of the product on site.
- E. Maintenance Data: For finishes to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Source Limitations:
 - Acoustical Ceiling Panels: Obtain each type through one source from a single manufacturer.
 - 2. Suspension Systems: Obtain each type through one source from a single manufacturer.
 - 3. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- B. Fire-Test-Response Characteristics: Provide acoustical panel ceilings that comply with the following requirements:
 - 1. Fire-Resistance Characteristics: Where indicated, provide acoustical panel ceilings identical to those of assemblies tested for fire resistance per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 2. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.
 - 3. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 4. Surface-Burning Characteristics: Provide acoustical panels complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84.
- C. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.
 - Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.7 COORDINATION

A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 BASIS-OF-DESIGN

- A. Basis-of-Design Products:
 - 1. ACT1: Armstrong Cirrus #558 Angled Tegular 9/16" grid.
 - a. Size: 24 by 24 by 7/8 inch.
 - b. Grid: Suprafine grid.

2.2 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Armstrong Ceilings.
 - 2. CertainTeed Ceilings.
 - 3. USG.

2.3 METAL SUSPENSION SYSTEMS

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.
 - 1. Structural Classification: Intermediate-duty system.
 - 2. End Condition of Cross Runners: Override (stepped) or butt-edge type.
 - 3. Face Design: Flat, flush.
 - 4. Cap Material: Steel or aluminum cold-rolled sheet.
 - 5. Color: White, prefinished.
 - 6. Grid Face Width: As specified with ACT type.
 - 7. Recycled Content: Use minimum recycled content of 25%.
- B. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated.

- Anchors in Concrete: Anchors with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing per ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency; zinc-plated for Class SC1 service.
 - a. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing and inspecting agency.
- C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
 - 1. Zinc-Coated Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106 diameter wire.
- D. Hold-Down Clips: At vestibules and areas subject to wind uplift, provide manufacturer's standard hold-down clips spaced 24 inches on all cross tees.

2.4 METAL EDGE MOLDINGS AND TRIM

- A. Roll-Formed Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.
 - 1. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
 - 2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
 - 3. For narrow-face suspension systems, provide suspension system and manufacturer's standard edge moldings that match width and configuration of exposed runners.
- B. Suspension Trim: Subject to compliance with requirements, provide one of the following:
 - 1. Armstrong World Industries, Inc.; Axiom.
 - 2. CertainTeed Ceilings; Approved equal.
 - 3. USG Interiors, Inc.; Compasso.

2.5 ACOUSTICAL SEALANT

A. Acoustical Sealant, for Concealed Joints: Manufacturer's standard nondrying, nonhardening, nonskinning, nonstaining, gunnable, joint sealant, recommended for sealing interior concealed joints to reduce airborne sound transmission.

- 1. Available Products: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. OSI (a division of Henkel); Pro-Series SC-175.
 - b. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
 - c. Pecora Corp.; BA-98.
 - d. Specified Technologies, Inc. (STI); Smoke N Sound Acoustical Sealant.
 - e. USG: SHEETROCK Acoustical Sealant.
- 2. Low-Emitting Materials: Provide adhesives and sealants in compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- 3. VOC Content, Architectural Sealants: 250 g/L or less.
- 4. Methylene chloride and perchloroethylene may not be intentionally added to sealants.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

- A. General: Install acoustical panel ceilings to comply with ASTM C 636 per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

- 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
- 5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
- 6. Do not attach hangers to steel deck tabs.
- 7. Space hangers not more than 48 o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
- C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
 - Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 - 2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
 - 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- D. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- E. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
 - 1. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
 - 2. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions, unless otherwise indicated.

3.4 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 095130 - METAL PANEL CEILINGS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Modular metal ceiling panels and accessories.
 - 2. Suspension systems, grid systems and ceiling hangers.
 - 3. Acoustical sealant at edge moldings at ceilings.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - Section 092110 GYPSUM BOARD ASSEMBLIES for gypsum board and cement board ceilings and soffits.
 - 2. Division 21 FIRE PROTECTION for fire-suppression components located in ceilings.
 - 3. Division 23 HEATING, VENTILATING AND AIR CONDITIONING for air handling and distribution components located in ceilings; and for instrumentation and control for HVAC systems, and for connections to hydronic radiant heating system piping.
 - 4. Division 26 ELECTRICAL for light fixture and alarm system components located in ceilings.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:
 - 1. Ceiling suspension members.
 - 2. Method of attaching hangers to building structure. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
 - 3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
 - 4. Minimum Drawing Scale: 1/4 inch = 1 foot.
- C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
 - 1. Metal panel: Set of 6 inch square Samples of each type, color, pattern, and texture.
 - 2. Exposed Suspension System Members, Moldings, and Trim: Set of 12 inch long Samples of each type, finish, and color.

- D. Asbestos Certification: Manufacturer's written certification that ceiling products contain no asbestos (0.0000%). Product labels indicating that it is the user's responsibility to test the products for asbestos are unacceptable and sufficient cause for rejection of the product on site.
- E. Maintenance Data: For finishes to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Source Limitations:
 - 1. Ceiling Panels: Obtain each type through one source from a single manufacturer.
 - 2. Suspension Systems: Obtain each type through one source from a single manufacturer.
- B. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.
 - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver metal panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing metal panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle metal panels carefully to avoid chipping edges or damaging units in any way.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install metal panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.7 COORDINATION

A. Coordinate layout and installation of metal panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 METAL PANELS, GENERAL

A. Basis of Design (ACT-3): Armstrong World Industries, Inc.; <u>Linear Synchro</u> with M2 perforation #8223W04 with accessories as required for wall to wall installation.

1. Color: Effects.

2.2 METAL SUSPENSION SYSTEMS

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.
- B. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated.
 - 1. Anchors in Concrete: Anchors with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing per ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency; zinc-plated for Class SC1 service.
 - 2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing and inspecting agency.
- C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
 - 1. Zinc-Coated Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - 2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106 diameter wire.
- D. Hold-Down Clips: At vestibules and areas subject to wind uplift, provide manufacturer's standard hold-down clips spaced 24 inches on all cross tees.

2.3 ACOUSTICAL SEALANT

A. Acoustical Sealant for Concealed Joints: Manufacturer's standard nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant, with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), recommended for sealing interior concealed joints to reduce airborne sound transmission.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which metal panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of metal panel ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of metal panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

- A. General: Install metal panel ceilings to comply with ASTM C 636 per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
 - 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
 - 6. Do not attach hangers to steel deck tabs.
 - 7. Space hangers not more than 48 o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
- C. Install edge moldings and trim of type indicated at perimeter of ceiling area and where necessary to conceal edges of metal panels.
 - 1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 - 2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
 - 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- D. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- E. Install metal panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

- 1. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by metal panel manufacturer.
- 2. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions, unless otherwise indicated.

3.4 CLEANING

A. Clean exposed surfaces of metal panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 096400 - WOOD FLOORING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Sand, strip and refinish existing wood flooring, including patch and repairs.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 064020 INTERIOR ARCHITECTURAL WOODWORK for wood base.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show installation details including location and layout of each type of wood flooring and accessory.
- C. Samples for Verification: For each type of wood flooring and accessory, with stain color and finish required, approximately 12 inches long and of same thickness and material indicated for the Work and showing the full range of normal color and texture variations expected.

1.4 QUALITY ASSURANCE

- A. Source Limitations: For field-finished wood flooring, obtain each species, grade, and cut of wood from one source with resources to provide materials and products of consistent quality in appearance and physical properties.
- B. Refinisher's Qualifications: Specialized wood flooring refinishing firm, with at least five years successful experience in installation and sanding and refinishing of the types specified, and acceptable to the wood finishing manufacturer.
- C. Oak Flooring: Comply with applicable National Wood Flooring Association (NWFA, formerly NOFMA) grading rules for species, grade, and cut.
- D. Mockups: Install mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. To set quality standards for installation, install mockup of floor area as shown on Drawings.

- 2. To set quality standards for sanding and application of field finishes, prepare finish mockup of floor area as shown on Drawings.
- 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver wood flooring materials in unopened cartons or bundles.
- B. Protect wood flooring from exposure to moisture. Do not deliver wood flooring until after concrete, masonry, plaster, ceramic tile, and similar wet work is complete and dry.
- C. Store wood flooring materials in a dry, warm, ventilated, weathertight location.

1.6 PROJECT CONDITIONS

- A. Conditioning period begins not less than seven days before wood flooring installation, is continuous through installation, and continues not less than seven days after wood flooring installation.
 - 1. Environmental Conditioning: Maintain an ambient temperature between 65 and 75 deg F and relative humidity planned for building occupants in spaces to receive wood flooring during the conditioning period.
 - 2. Wood Flooring Conditioning: Move wood flooring into spaces where it will be installed, no later than the beginning of the conditioning period.
 - a. Do not install flooring until it adjusts to relative humidity of, and is at same temperature as, space where it is to be installed.
 - b. Open sealed packages to allow wood flooring to acclimatize immediately on moving flooring into spaces in which it will be installed.
- B. After conditioning period, maintain relative humidity and ambient temperature planned for building occupants.

PART 2 - PRODUCTS

2.1 FIELD-FINISHED WOOD FLOORING

- A. Solid-Wood Flooring (F-#): Match existing, reuse salvaged materials where available.
- B. Wood Filler: Compatible with finish system components and recommended by filler and finish manufacturers for use indicated. If required to match approved Samples, provide pigmented filler.

2.2 ACCESSORY MATERIALS

- A. Wood Subfloor: As specified in Section 061000 ROUGH CARPENTRY.
- B. Trowelable Leveling and Patching Compound: Latex-modified, hydraulic-cement-based formulation approved by wood flooring manufacturer.

- C. Wood Flooring Adhesive: Mastic recommended by flooring and adhesive manufacturers for application indicated.
 - 1. Adhesive shall have a VOC content of not more than 100 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Fasteners: As recommended by manufacturer, but not less than that recommended in NWFA's "Installation Guidelines: Wood Flooring."
- E. Cork Expansion Strip: Composition cork strip.
- F. Trim: In same species and grade as wood flooring, unless otherwise indicated.
 - 1. Threshold: Tapered on each side and routed at bottom of one side to accommodate wood flooring.
 - 2. Reducer Strip: 2 inches wide, tapered on 1 side, and in thickness matching wood flooring.
- G. Cleaning Materials: Provide low-emitting cleaning solutions as recommended by NOFMA.
- H. Finish: Provide water-based stain, UV resistant sealer, and polyurethane finish system.
 - 1. Basis of Design: Bona; Bonatech Traffic, matte finish.
 - 2. Wood Stain: Penetrating type non-fading type, color to match existing, as approved by Architect.
 - 3. Floor coatings shall have a VOC content of not more than 100 g/L when calculated according to South Coast District (SCAQMD) Rule #1113, Architectural Coatings, rules in effect January 1, 2004.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas and conditions, with Installer present, for compliance with requirements for maximum moisture content, installation tolerances, and other conditions affecting performance of wood flooring.
 - Verify that substrates comply with tolerances and other requirements specified in other Sections.
 - 2. For adhesively applied wood flooring, verify that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Substrate Moisture Testing, General: Perform tests recommended by manufacturer or, if none, comply with applicable recommendations in NWFA's "Installation Guidelines: Wood Flooring."
 - 1. Proceed with installation only after substrates pass testing.
- C. Concrete Moisture Testing: Perform anhydrous calcium chloride test per ASTM F 1869, as follows:

- 1. Perform tests so that each test area does not exceed 200 sq. ft. and perform not less than 2 tests in each installation area with test areas evenly spaced in installation area.
- 2. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
- 3. Perform alkalinity and adhesion tests recommended in writing by manufacturer or, if none, according to NWFA's "Installation Guidelines: Wood Flooring." Proceed with installation only after substrates pass testing.

3.2 PREPARATION

- A. Grind high spots and fill low spots on concrete substrates to produce a maximum 1/8-inch deviation in any direction when checked with a 10-foot straight edge.
 - 1. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
- B. Remove coatings, including curing compounds, and other substances on substrates that are incompatible with installation adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- C. Broom or vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Preparation for Repairs and Refinishing Existing Wood Floors:
 - 1. Patch and replace damaged wood flooring and countersink nails, prior to sanding and refinishing. Weave wood floor strips into existing flooring to stagger end joints and maintain continuous appearance.
 - 2. Sand existing wood flooring to remove existing floor finish, offsets and non-level conditions, ridges, cups, and sanding machine marks, and all other conditions which would be visually noticeable after refinishing.
 - 3. Where required, bleach existing floor areas that have been damaged or darkened by water stains or moisture. Treat areas until Architect's approval is received.

3.3 INSTALLATION

- A. Comply with flooring manufacturer's written installation instructions, but not less than applicable recommendations in NWFA's "Installation Guidelines: Wood Flooring."
- B. Wood Subfloor: Install according to requirements in Section 061000 ROUGH CARPENTRY.
- C. Provide expansion space at walls and other obstructions and terminations of flooring of not less than 3/4 inch.

3.4 FIELD FINISHING

- A. Machine-sand flooring to remove offsets, ridges, cups, and sanding-machine marks that would be noticeable after finishing. Vacuum and tack with a clean cloth immediately before applying finish.
 - 1. Comply with applicable recommendations in NWFA's "Installation Guidelines: Wood Flooring".

- B. Fill and repair wood flooring seams and defects.
- C. Apply floor-finish materials in number of coats recommended by finish manufacturer for application indicated, but not less than one coat of floor sealer and four finish coats.
 - 1. For water-based finishes, use finishing methods recommended by finish manufacturer to minimize grain raise.
 - 2. First Coat: Apply stains to achieve an even color distribution matching approved Samples.
 - 3. Second Coat: Apply sealer.
 - 4. Third, Fourth and Fifth Coat: Apply polyurethane finish.
- D. Cover wood flooring before finishing.
- E. Do not cover wood flooring after finishing until finish reaches full cure, and not before seven days after applying last finish coat.

3.5 PROTECTION

- A. Protect installed wood flooring during remainder of construction period with covering of heavy kraft paper or other suitable material. Do not use plastic sheet or film that might cause condensation.
 - Do not move heavy and sharp objects directly over kraft-paper-covered wood flooring.
 Protect flooring with plywood or hardboard panels to prevent damage from storing or
 moving objects over flooring.

END OF SECTION

SECTION 096510 - RESILIENT FLOORING AND ACCESSORIES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Resilient flooring.
 - 2. Resilient wall base and accessories.
 - 3. Resilient stair accessories.
 - 4. Substrate preparation for resilient flooring and accessories.
 - 5. High-performance adhesive suitable for RH and pH measured in substrate.

1.3 PERFORMANCE REQUIREMENTS

- A. Wet Dynamic Coefficient of Friction: For flooring exposed as a walking surface, provide products with the following values as determined by testing identical products per ANSI/ NFSI B101.3 2012 Test Method for Measuring Wet DCOF of Common Hard-Surface Floor Materials, or ANSI 326.3 American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Materials 2017. Testing by other methods or earlier editions of the specified test method is not acceptable.
 - 1. Wet Dynamic Coefficient of Friction: Not less than 0.43.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each type of floor covering. Include floor covering layouts, locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 1. Show details of special patterns.
- C. Samples for Verification: Full-size units of each color and pattern of resilient flooring required.
 - 1. Resilient Wall Base and Accessories: Manufacturer's standard-size Samples, but not less than 12 inches long, of each resilient product color and pattern required.
- D. Maintenance Data: For resilient products to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide products identical to those tested for fire-exposure behavior per test method indicated by a testing and inspecting agency acceptable to authorities having jurisdiction.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store tiles on flat surfaces.

1.7 PROJECT CONDITIONS

- A. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F in spaces to receive floor tile during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After postinstallation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during floor covering installation.
- D. Close spaces to traffic for 48 hours after floor covering installation.
- E. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 RESILIENT FLOORING SCHEDULE

- A. LVT1A: Shaw Contract; Joy squared #0993V.
 - 1. Size: 24 by 24 inches.
 - 2. Color: #93100 Snow Day.
 - Location: Early Ed Classroom.
- B. LVT1B: Shaw Contract; Joy squared #0993V.
 - 1. Size: 24 by 24 inches.
 - 2. Color: #93761 Backyard.
 - 3. Location: Early Ed Classroom,513 fac.
- C. LVT1C: Shaw Contract; Joy squared #0993V.
 - 1. Size: 24 by 24 inches.
 - 2. Color: #93895 Carousel.

- 3. Location: 513 Fac.
- D. LVT1D: Shaw Contract; Joy squared #0993V.
 - 1. Size: 24 by 24 inches.
 - 2. Color: #93360 Park.
 - 3. Location: Early Ed Classroom.
- E. LVT1E: Shaw Contract; Joy squared #0993V.
 - 1. Size: 24 by 24 inches.
 - 2. Color: #93410 Pool.
 - 3. Location: Early Ed Classroom.
- F. LVT2: Shaw Contract; Coded #4143V.
 - 1. Size 6 by 48 inches.
 - 2. Color: #43504 Declare.
 - Location: Collab rooms.
- G. LVT3: Shaw Contract; Strand #0156V.
 - 1. Size: 18 by 36 inches.
 - 2. Color: 3A #16516 Dune ,3B #16761 Clay, 3C- #16115 Wool.
 - 3. Location: 3A.3B- Life Skills., 3C-Classrooms, Copy
- H. Rubber treads: Tarkett/ Johnsonite tread riser one piece with matching landing tile.
 - 1. Color: HNTRSP VK5 with Ada tread insert in contrasting color- Yellow.
- I. Rubber Base:
 - 1. Tarkett/ Johnsonite.
 - a. Location: With carpet.
 - b. Color: RB1-Inkwell TH3.
 - 2. Tarkett/ Johnsonite.
 - a. Location: Lifeskills, Early Ed classrooms
 - b. Color: RB2-Moonrock 29.
 - 3. Tarkett/ Johnsonite.
 - a. Location: Miscellaneous.
 - b. Color: RB3-Black 40.
 - 4. Tarkett/Johnsonite
 - a. Location: Classrooms, Copy
 - b. Color: RB4- TBD

2.2 LUXURY VINYL TILE FLOOR COVERING

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering RESILIENT FLOORING AND ACCESSORIES 096510 - 3

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products that may be incorporated into the Work include, but are not limited to, the following:

1. Armstrong World Industries, Inc.

- 2. Congoleum Corporation.
- 3. Mannington Mills, Inc.
- 4. Shaw Group.
- 5. Tarkett, Inc.
- B. Luxury Vinyl Tile Floor Covering: ASTM F 1700.

2.3 RESILIENT WALL BASE

- 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:
 - American Biltrite Flooring; AB Pure.
 - 2. Johnsonite, a division of Tarkett.
 - 3. Nora Systems, Inc.
- B. Resilient Wall Base: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous). Do not use polyvinyl chloride (PVC).
 - 1. Shape: Straight (toeless) at carpet and coved at concrete and resilient flooring.
 - 2. Minimum Thickness: 0.125 inch.
 - 3. Height: 4 inches, typical. 6 inches, corridors and Cafetorium.
 - 4. Lengths: Coils in manufacturer's standard length.
 - 5. Outside Corners: Premolded.
 - 6. Inside Corners: Premolded.
 - 7. Surface: Smooth.
 - 8. Material Ingredients: Cradle to Cradle (C2C) certification or Declare product label. PVC, phthalate-, chlorine-, and halogen-free.
 - 9. Low-Emitting Materials: FloorScore certification.

2.4 RESILIENT STAIR ACCESSORIES

- 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 Biltrite Flooring; AB Pure.
 - 2. Johnsonite, a division of Tarkett.
 - 3. Nora Systems, Inc.
- B. Resilient Treads and Risers: ASTM F 2169, Rubber, Composition A.
 - 1. Size: Lengths and depths to fit each stair tread in one piece.
- C. Stringers: Of same thickness as risers, height and length after cutting to fit risers and treads and to cover stair stringers; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.

2.5 RESILIENT MOLDING ACCESSORY

- 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 Biltrite Flooring; AB Pure.

- 2. Johnsonite, a division of Tarkett.
- 3. Nora Systems, Inc.
- B. Types Include the Following as Applicable: Cap for cove carpet, cap for cove resilient sheet floor covering, carpet edge for glue-down applications, nosing for carpet, nosing for resilient floor covering, reducer strip for resilient floor covering, joiner for tile and carpet.
 - 1. Material: Rubber.
 - 2. Profile and Dimensions: As required for a complete installation.

2.6 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic cement based formulation provided or approved by resilient product manufacturer for applications indicated.
 - 1. Available Products: Mapei; Mapecem Premix.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
 - Low-Emitting Materials: Provide adhesives in compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - a. VOC Content: 50 g/L or less.
 - b. Methylene chloride and perchloroethylene may not be intentionally added to adhesives. Do not use adhesives that contain ureaformaldehyde.
 - 2. Adhesives, for Wall Base:
 - a. Available Products: Subject to compliance with requirements, provide one of the following products:
 - 1) Forbo; L910W Wall Adhesive.
 - 2) Johnsonite; 960 Cove Base Adhesive.
- C. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edges of tiles, and in maximum available lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances, moisture content, and other conditions affecting performance.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Alkalinity and Adhesion Testing: Perform tests recommended by flooring manufacturer. Proceed with installation only after substrate alkalinity falls within a range on pH scale not less than 5 or more than 9 pH, or as otherwise required in writing by manufacturer of flooring.
 - 3. Moisture Vapor Emission Testing:
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours, or as otherwise required in writing by manufacturer of flooring.
 - 4. Relative Humidity Testing:
 - a. Perform relative humidity test, ASTM F 2170. Proceed with installation only after substrates have a maximum relative humidity level of 75 percent, or as otherwise required in writing by manufacturer of flooring.
 - 5. Perform tests indicated above and as recommended by flooring manufacturer. Proceed with installation only after substrates pass testing.
- C. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- D. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.
 - 1. Slope floor where indicated on Drawings.
- E. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
 - Do not install resilient products until they are same temperature as space where they are to be installed.
- F. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 TILE INSTALLATION

- A. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 1. Lay tiles in pattern indicated.
- B. Match tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
- C. Scribe, cut, and fit tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, edgings, doorframes, thresholds, and nosings.
- D. Extend tiles into toe spaces, door reveals, closets, and similar openings.
- E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.
- F. Install tiles on covers for telephone and electrical ducts and similar items in finished floor areas. Maintain overall continuity of color and pattern with pieces of tile installed on covers. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- G. Adhere tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 RESILIENT WALL BASE INSTALLATION

- A. Apply wall base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- B. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- C. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- D. Do not stretch wall base during installation.
- E. On masonry surfaces or other similar irregular substrates, fill voids along top edge of wall base with manufacturer's recommended adhesive filler material.
- F. Premolded Corners: Install premolded corners before installing straight pieces.

3.5 RESILIENT ACCESSORY INSTALLATION

A. Resilient Stair Accessories:

- 1. Tightly adhere to substrates throughout length of each piece.
- 2. For treads installed as separate, equal-length units, install to produce a flush joint between units
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor coverings that would otherwise be exposed.

3.6 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
 - a. Do not wash surfaces until after time period recommended by manufacturer.
- B. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.
 - 1. Do not apply protective floor polish.
 - 2. Cover products installed on horizontal surfaces with undyed, untreated building paper until Substantial Completion.
 - 3. Do not move heavy and sharp objects directly over surfaces. Place hardboard or plywood panels over flooring and under objects while they are being moved. Slide or roll objects over panels without moving panels.

END OF SECTION

SECTION 096609 - TERRAZZO FLOORING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Repairing and new terrazzo floor tile.
 - 2. Patching and repairing existing terrazzo.
 - 3. Refinishing existing terrazzo.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 079200 JOINT SEALANTS for sealants installed with terrazzo.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include terrazzo patching and repairing requirements. Include plans, elevations, sections, component details, and attachments to other Work. Show layout of the following:
 - 1. Divider and control- and expansion-joint strips.
 - 2. Base and border strips.
 - 3. Abrasive strips.
 - 4. Precast terrazzo jointing and edge configurations.
 - 5. Terrazzo patterns.
 - Indicate areas of patching and repairing.
- C. Samples for Verification: For each type, material, color, and pattern of terrazzo and accessory required showing the full range of color, texture, and pattern variations expected. Label each terrazzo sample to identify manufacturer's matrix color and aggregate types, sizes, and proportions. Prepare samples of same thickness and from same material to be used for the Work in size indicated below:
 - 1. Terrazzo: 6-inch-square samples.
 - 2. Accessories: 6-inch-long samples of each exposed strip item required.
 - 3. Patching and Repairing: 6 -inch-long sample crack repair.
- D. Installer Certificates: Signed by manufacturers certifying that installers comply with requirements.

- E. Qualification Data: For Installer.
- F. Maintenance Data: For terrazzo patching and repairing to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer (applicator) who is acceptable to terrazzo manufacturer to install, patch, and repair manufacturer's products.
 - 1. Engage an installer who is certified in writing by terrazzo manufacturer as qualified to install manufacturer's products.
- B. Source Limitations: Obtain primary terrazzo materials through one source from a single manufacturer. Provide secondary materials including patching and fill material, joint sealant, and repair materials of type and from source recommended by manufacturer of primary materials.
- C. Source Limitations for Aggregates: Obtain each color, grade, type, and variety of aggregate from one source with resources to provide materials of consistent quality in appearance and physical properties.
- D. NTMA Standards: Comply with NTMA's "Terrazzo Specifications and Design Guide" and with written recommendations for terrazzo type indicated unless more stringent requirements are specified.
- E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01. Review methods and procedures related to terrazzo including, but not limited to, the following:
 - Inspect and discuss condition of substrate and other preparatory work performed by other trades
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review special terrazzo designs and patterns.
 - 4. Review dust-control procedures.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting terrazzo installation.
- B. Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during terrazzo installation.
- C. Close spaces to traffic during epoxy terrazzo application and for not less than 24 hours after application unless manufacturer recommends a longer period.
- D. Control and collect dust produced by grinding operations. Protect adjacent construction from detrimental effects of grinding operations.
 - Provide dustproof partitions and temporary enclosures to limit dust migration and to isolate areas from noise.

PART 2 - PRODUCTS

2.1 **MANUFACTURERS**

- A. Terrazzo Repair Manufacturers: Subject to compliance with requirements, manufacturers with products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Crossfield Products Corp., Dex-O-Tex Division.
 - General Polymers Corporation; Sherwin Williams. 2.
 - Key Resin Co. 3.
 - Master Terrazzo Technologies, LLC. 4.
 - 5. TEC, Inc., an H. B. Fuller Company.
- B. Basis of Design, Terrazzo Tile: Wausau Tile; Tectura.
 - Size 24 by 24 by 5/8 inch. Pattern at lobby to include 3/8" zinc divider strips as shown 1.
 - 2. Color: Custom 4 colors based on the following:

Field color: T23-204P a. Accent 1: T23-203 Polish b. Accent 2: E20-202 Custom C. Accent 3: TZ30 Crushed ice

2.2 TERRAZZO MATERIALS

d.

- Compatibility: Provide products recommended by manufacturers to be fully compatible with A. existing materials.
- B. **Epoxy Terrazzo Materials:**
 - 1. Flexible Reinforcing Membrane: Manufacturer's resinous membrane for substrate crack preparation and reflective crack reduction.
 - 2. Primer: Product of manufacturer recommended for substrate and use indicated.
 - Epoxy Resin: Manufacturer's standard recommended for use indicated and in color 3. required for mix indicated.
 - Glass Chips: Complying with NTMA standards for mix indicated and containing no 4. deleterious or foreign matter.
 - Divider-Strip Adhesive: Epoxy-resin adhesive recommended by adhesive manufacturer 5. for this use and acceptable to terrazzo manufacturer.
 - 6. Finishing Grout: Resin based.
 - Seal Coat: 7. Slip resistant, thin-coat terrazzo sealer of or approved by terrazzo manufacturer.
- Mix: Comply with NTMA's "Guide Specification for Epoxy Terrazzo" and manufacturer's written C. instructions for component proportions and mixing.
 - Color and Pattern: Match existing and provide custom colors and mixes, including but not 1. limited to matrix T23+.

2.3 **DIVIDER AND ACCESSORY STRIPS**

A. Thin-Set Divider Strips: Angle or T type, 1/4 inch deep; match existing.

- B. Control-Joint Strips: Separate, double L-type angles, positioned back to back, that match material, thickness, and color of divider strips and in depth required for topping thickness indicated.
- C. Accessory Strips: Match divider-strip width, material, and color unless otherwise indicated. Use accessory strips to match existing, as required to provide a complete installation:

2.4 MISCELLANEOUS ACCESSORIES

- A Strip Adhesive: Epoxy-resin adhesive recommended by adhesive manufacturer for this use and acceptable to terrazzo manufacturer.
 - 1. Use adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Anchoring Devices:

- 1. Strips: Provide mechanical anchoring devices for strip materials as required for secure attachment to substrate.
- 2. Precast Terrazzo: Provide mechanical anchoring devices as recommended by fabricator for proper anchorage and support of units for conditions of installation and support.
- C. Patching and Fill Material: Terrazzo manufacturer's resinous product approved and recommended by manufacturer for application indicated.
 - 1. Epoxy Grout: To match existing.
- D. Joint Compound: Terrazzo manufacturer's resinous product approved and recommended by manufacturer for application indicated.
- E. Cleaner: Chemically neutral cleaner with pH factor between 7 and 10 that is biodegradable, phosphate free, and recommended by sealer manufacturer for use on terrazzo type indicated.
- F. Sealer: Slip- and stain-resistant penetrating-type sealer that is chemically neutral with pH factor between 7 and 10; does not affect color or physical properties of terrazzo; is recommended by sealer manufacturer; and complies with NTMA's "Terrazzo Specifications and Design Guide" for terrazzo type indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 TERRAZZO PATCHING AND REPAIRING

A. General Cleaning: Clean and remove wax and existing finishes from existing terrazzo surfaces, in a manner which results in uniform cleaning of surfaces, including corners, moldings, and interstices.

- Crack Cleaning: Remove dirt, debris, and sealers from existing cracks, by mechanical methods.
- B. General Repair: Remove and replace terrazzo areas that evidence lack of bond with substrate. Cut out terrazzo areas in panels defined by strips and replace to match adjacent terrazzo, or repair panels according to NTMA's written recommendations, as approved by Architect.
 - 1. Crack and Small Hole Repair: Fill existing cracks larger than 1/32 inch, with approved materials to match existing terrazzo.
 - a. At existing cracks between 1/32 and 1/8 inch, install epoxy matrix fill.
 - b. At existing cracks between 1/8 and 1/4 inch, drill holes every 2 to 4 inches to accept a 1/4 inch chip.
 - c. At existing cracks between 1/4 and 3/8 inch, drill holes every 2 to 4 inches to accept a 3/8 inch chip.
 - d. At existing cracks larger than 1/4 inch, fully seed with 1/4 inch chips.
 - 2. Large Hole Repair: Provide new terrazzo flooring in accordance with requirements of NTMA's "Guide Specifications for Standard Terrazzo" to match existing.

3.3 TERRAZZO REFINISHING

- A. Initial Grinding: Grind with 60-80 grit stone and water.
- B. Cleaning: Clean floor with clean water and rinse clear. Remove excess water.
- C. Regrouting: Apply grout, filling voids completely, and allow to cure.
- D. Fine Grinding: Grind with 120 grit stones until all grout has been removed from the terrazzo surface.

3.4 CLEANING AND PROTECTION

- A. Cleaning:
 - 1. Remove grinding dust from installation and adjacent areas.
 - 2. Wash surfaces with cleaner according to NTMA's written recommendations and manufacturer's written instructions; rinse surfaces with water and allow to drythoroughly.
- B. Sealing:
 - 1. Seal surfaces according to NTMA's written recommendations.
 - 2. Apply sealer according to sealer manufacturer's written instructions.
- C. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure that terrazzo is without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 096800 - CARPETING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Carpet tile.
 - 2. Carpet accessories.
 - 3. Substrate preparation for carpet and accessories.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 096510 RESILIENT FLOORING AND ACCESSORIES for resilient wall base and accessories installed with carpet.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - Include manufacturer's written data on physical characteristics, durability, and fade resistance. Include installation recommendations for each type of substrate required.
- B. Shop Drawings: Show the following:
 - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet.
 - 2. Carpet type, color, and dye lot.
 - 3. Seam locations, types, and methods.
 - 4. Type of subfloor.
 - 5. Type of installation.
 - 6. Pattern type, repeat size, location, direction, and starting point.
 - 7. Pile direction.
 - 8. Type, color, and location of insets and borders.
 - 9. Type, color, and location of edge, transition, and other accessory strips.
 - 10. Transition details to other flooring materials.
- C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

- 1. Carpet Tile: Full-size Sample.
- 2. Exposed Edge, Transition, and other Accessory Stripping: 12-inch-long Samples.
- D. Product Schedule: Use same room and product designations indicated on Drawings and in schedules.
- E. Sample Warranties: For special warranties.
- F. Maintenance Data: For carpet to include in maintenance manuals specified in Division 01. Include the following:
 - 1. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 - 2. Precautions for cleaning materials and methods that could be detrimental to carpet.

1.4 QUALITY ASSURANCE

- A. Carpeting Standard: Comply with the Carpet and Rug Institute's "CRI Carpet Installation Standard," 2011 edition, formerly CRI 104 "Standard For Installation Specification Of Commercial Carpet."
- B. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.
- C. Mockups: Before installing carpet, build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. General: Comply with CRI Carpet Installation Standard, Section 5, "Storage and Handling."
- B. Deliver carpet in original mill protective covering with mill register numbers and tags attached.

1.6 PROJECT CONDITIONS

- A. General: Comply with CRI Carpet Installation Standard, Section 7, "Site Conditions."
- B. Environmental Limitations: Do not install carpet until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Do not install carpet over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet manufacturer.

D. Where demountable partitions, equipment, or other items are indicated for installation on top of carpet, install carpet before installing these items.

1.7 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Carpet Warranty: Written warranty, signed by carpet manufacturer agreeing to replace carpet that does not comply with requirements or that fails within specified warranty period. Warranty does not include deterioration or failure of carpet due to unusual traffic, failure of substrate, vandalism, or abuse. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, and delamination.
 - 1. Warranty Period: Ten years from date of Substantial Completion.

1.8 EXTRA MATERIALS (ATTIC STOCK)

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Carpet: Full-width rolls and tiles equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. InterfaceFLOR.
 - 2. Milliken & Co.
 - 3. Mohawk Group.
 - 4. Shaw, a Berkshire Hathaway Co.
 - 5. Tandus Centiva, a Tarkett Company.

2.2 CARPET

- A. Carpet Products: Subject to compliance with requirements, provide one of the following:
 - 1. Carpet Types (CPT-#):
 - a. CPT1: Mohawk; Denim Culture Made to last #GT350.
 - 1) Size: 24 by 24 inches with Ecoflex One backing.

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- 2) Pattern: Vertical Ashlar.
- 3) Color: 565 Indigo.
- 4) Location: Offices.
- b. CPT2: Shaw Shifting Fields; Enclave Tile 5T371.
 - 1) Size: 18 by 36 inches.
 - 2) Color: Reservoir 71485.
 - 3) Location: Cafetorium, including rubber nosing for the stepped flooring and reducer strips as required.
- 2. Building Product Disclosure and Optimization, Environmental Product Declarations (EPD): Product specific Type III EPD.
- 3. Low-Emitting Materials, General Emissions Evaluation: Carpet and Rug Institute Green Label Plus.
- 4. Do not permit polyvinyl chloride (PVC) or styrene butadiene rubber (SBR) carpet backing materials.

B. Performance Characteristics:

- 1. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm according to NFPA 253.
- 2. Smoke Density: Not more than 450, when tested in accordance with ASTM E 662 or NFPA 258.
- 3. Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.

2.3 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided by or recommended by the carpet manufacturer.
- B. Rubber reducer edges: Provide manufacturer's standard rubber reducer edges.
- C. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and that is recommended by carpet manufacturer.
 - Low-Emitting Materials, General Emissions Evaluation: Provide adhesives in compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - 2. VOC Content: Not more than 50 g/L.
 - 3. Methylene chloride and perchloroethylene may not be intentionally added to adhesives. Do not use adhesives that contain urea formaldehyde.
- D. Adhesive Film, for Carpet Tiles: Pressure sensitive adhesive, applied on one side of a polyester film, recommended by carpet tile manufacturer for releasable installation.
 - 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. InterfaceFLOR; TacTiles.
- b. Shaw; LokDots Adhesive.
- c. Tandus Centiva; Tandus Tape+
- E. Seaming Adhesive, for Sheet Carpet: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance. Verify that substrates and conditions are satisfactory for carpet installation and comply with requirements specified.
- B. Examine carpet for type, color, pattern, and potential defects.
- C. Concrete Subfloors: Comply with CRI Carpet Installation Standard, Section 9, "Testing Concrete Substrates." Verify that concrete slabs comply with ASTM F 710 and the following:
 - 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by the carpet manufacturer.
 - 2. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with CRI Carpet Installation Standard, Section 7.3, "Site Conditions; Floor Preparation," and carpet manufacturer's written installation instructions for preparing substrates indicated to receive carpet installation.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Alkalinity and Adhesion Testing: Perform tests recommended by flooring manufacturer. Proceed with installation only after substrate alkalinity falls within a range on pH scale not less than 5 or more than 9 pH, or as otherwise required in writing by manufacturer of flooring.
 - 3. Moisture Vapor Emission Testing:
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission

rate of 3 lb of water/1000 sq. ft. in 24 hours, or as otherwise required in writing by manufacturer of flooring.

- 4. Relative Humidity Testing:
 - a. Perform relative humidity test, ASTM F 2170. Proceed with installation only after substrates have a maximum relative humidity level of 75 percent, or as otherwise required in writing by manufacturer of flooring.
- 5. Perform tests indicated above and as recommended by flooring manufacturer. Proceed with installation only after substrates pass testing.
- C. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
- D. Broom and vacuum clean substrates to be covered immediately before installing carpet. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. Carpet Tile: Comply with CRI Carpet Installation Standard, Section 18, "Modular Carpet," and with carpet tile manufacturer's written installation instructions.
 - 1. Installation Method, for Adhesive: Partial glue down; install periodic tiles with releasable, pressure-sensitive adhesive.
 - 2. Installation Method, for Adhesive Film: Free lay; apply adhesive film squares at corners of tiles.
 - a. Do not install tiles with adhesive film at stair and ramp locations.
 - b. Do not install tiles with adhesive film over existing carpets.
 - 3. Installation Method, for No Adhesives: Free lay; press tiles firmly.
 - a. Do not install tiles without adhesive at stair and ramp locations.
 - b. Do not install tiles without adhesive over existing carpets.
 - 4. Carpet Tile Pattern: As directed by Architect.
 - 5. Maintain dye lot integrity. Do not mix dye lots in same area.
- B. Install pattern parallel to walls and borders.
- C. Do not bridge building expansion joints with carpet.
- D. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet manufacturer.
- E. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet:
 - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
 - 2. Remove yarns that protrude from carpet surface.
 - 3. Vacuum carpet using commercial machine with face-beater element and HEPA filter.
- B. Protect installed carpet to comply with CRI Carpet Installation Standard, Section 20, "Protecting Indoor Installations."
- C. Protect carpet against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet manufacturer.

END OF SECTION

SECTION 098430 - SOUND-ABSORBING PANELS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Back-mounted acoustical wall panels.
 - Acoustic baffles.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 061000 ROUGH CARPENTRY for wood blocking.
 - 2. Section 095100 ACOUSTICAL CEILINGS for acoustical ceiling panels supported by exposed suspension system and tested for noise reduction.

1.3 DEFINITIONS

A. NRC: Noise reduction coefficient.

1.4 SUBMITTALS

- A. Product Data: For each type of panel edge, core material, and mounting indicated.
- B. Shop Drawings: For acoustical wall panels. Include mounting devices and details; details at panel head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Include elevations showing panel sizes and direction of fabric weave and pattern matching. Indicate panel edge and core materials.
- C. Coordination Drawings: Show intersections with wall base, electrical receptacles and switches, and other adjacent work.
- D. Samples for Initial Selection: For each type of fabric facing material from acoustical wall panel manufacturer's full range.
- E. Samples for Verification: For the following products. Prepare Samples from same material to be used for the Work.

- 1. Fabric: Full-width by 36-inch-long Sample from dye lot to be used for the Work, and as follows:
 - a. With specified treatments applied.
 - b. Show complete pattern repeat.
 - c. Mark top and face of fabric.
- 2. Panel Edge: 12-inch-long Sample showing edge profile, corner, and finish.
- 3. Core Material: 12-inch-square Sample showing corner.
- 4. Mounting Device: Full-size Sample.
- 5. Sample Panels: No larger than 36 by 36 inches. Show joints and mounting methods.
- F. Product Certificates: For each type of acoustical wall panel, signed by product manufacturer.
- G. Qualification Data: For fabricator and testing agency.
- H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of acoustical wall panel.
- I. Maintenance Data: For acoustical wall panels to include in maintenance manuals. Include fabric manufacturers' written cleaning and stain-removal recommendations.
- J. Warranty: Special warranty specified in this Section.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Source Limitations: Obtain acoustical wall panels through one source from a single manufacturer.
- C. Fire-Test-Response Characteristics: Provide acoustical wall panels with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with fabric and acoustical wall panel manufacturers' written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.
- B. Deliver materials and panels in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.
- C. Protect panel edges from crushing and impact.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install acoustical wall panels until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Lighting: Do not install acoustical wall panels until a permanent level of lighting is provided on surfaces to receive acoustical wall panels.
- C. Air-Quality Limitations: Protect acoustical wall panels from exposure to airborne odors, such as tobacco smoke, and install panels under conditions free from odor contamination of ambient air.
- D. Field Measurements: Verify locations of acoustical wall panels by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of acoustical wall panels that fail in performance, materials, or workmanship within specified warranty period.
 - 1. Failure in performance includes, but is not limited to, acoustical performance.
 - 2. Failures in materials include, but are not limited to, fabric sagging, distorting, or releasing from panel edge; or warping of core.
 - 3. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 BACK-MOUNTED ACOUSTICAL WALL PANELS

- A. Basis-of-Design: Carnegie, Xorel, Artform Peak.
- B. Manufacturers

- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers that may be incorporated into the Work include, but are not limited to, the following:
 - a. Decoustics Ltd.
 - b. Kinetics Noise Control.
 - c. MBI Products Company.
 - d. Quiet Concepts, a division of PCI Industries.
 - e. Sound Concepts.
 - f. Wall Technology, an Owens Corning Company.

C. Core Materials

- 1. Glass-Fiber Board: ASTM C 612, Type IA or Types IA and IB; density as specified, unfaced, dimensionally stable, molded rigid board, with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
 - a. Nominal Core Density: 4 to 7 lb/cu. ft.
- D. Back-Mounted, Edge-Reinforced Acoustical Wall Panels With Glass-Fiber Board Core
 - 1. Panel Construction: Manufacturer's standard panel construction consisting of facing material laminated to front face, edges, and back border of dimensionally stable, rigid glass-fiber board core; with edges chemically hardened to reinforce panel perimeter against warpage and damage.
 - a. Nominal Core Thickness: 1 inch
 - b. Overall System NRC: Not less than 0.80, for Type A mounting per ASTM E 795.
 - c. Panel Width: As indicated on Drawings
 - d. Panel Height: Fabricated height as indicated on Drawings.
 - e. Panel Edge Detail: As indicated on Drawings.
 - f. Corner Detail: Square to form continuous profile to match edge detail.
 - 2. Facing Material: Fabric from same dye lot; color and pattern as selected by Architect from manufacturer's full range.
 - a. Manufacturer:
 - 1) Xorel: Meteor 6427.
 - a) Color: 746.
 - 2) Xorel: Quarry 6619.
 - a) Color: 113.
 - 3) Xorel: Satellite Embroider 6103.

- a) Color: 1.
- 4) Luna:
 - a) Color:
 - b) Nifty SN1-5228.
 - c) Habanero, 54"w.
 - d) Trapeze UPZ277 Pantomime, 54"w.
- 3. Back-Mounting Devices: Concealed on backside of panel, recommended to support weight of panel, and as follows:
 - a. As recommended by manufacturer.

E. Fabrication

- 1. Sound-Absorption Performance: Provide acoustical wall panels with minimum NRCs indicated, as determined by testing per ASTM C 423 for mounting type specified.
- 2. Acoustical Wall Panels: Panel construction consisting of facing material adhered to [face,] edges and back border of dimensionally stable core; with rigid edges to reinforce panel perimeter against warpage and damage.
 - a. Glass-Fiber Board: Resin harden areas of core for attachment of mounting devices.
- 3. Fabric Facing: Stretched straight, on the grain, tight, square, and free from puckers, ripples, wrinkles, sags, blisters, seams, adhesive, or other foreign matter. Applied with visible surfaces fully covered.
 - a. Where square corners are indicated, tailor corners.
 - b. Where radius or other nonsquare corners are indicated, attach facing material so there are no seams or gathering of material.
 - c. Where fabrics with directional or repeating patterns or directional weave are indicated, mark fabric top and attach fabric in same direction so pattern or weave matches in adjacent panels.
- 4. Dimensional Tolerances of Finished Units: Plus or minus 1/16 inch for the following:
 - a. Thickness.
 - b. Edge straightness.
 - c. Overall length and width.
 - d. Squareness from corner to corner.
 - e. Chords, radii, and diameters.

2.2 ACOUSTIC BAFFLE

A. Basis of Design: Arktura; Soft Grid Switch Duotone.

- 1. Dimensions: 7'-6" x 7'-6" x 7 7/8".
- 2. Fin: 12 mm thickness x 12 inches high fin. Arktura Soft Sound acoustical material -100% PET plastic. Class A (ASTM E84-14). Spacing to achieve NRC.90.
- 3. Fin Support rib and Hangar rib 20 GA steel with powder coat finish.
- 4. Colors:
 - a. Soft Sound Sky Blue.
 - b. Heather Gray.
- 5. Fire rating: Class A.
- 6. Fins shall be joined continuously between modules.
- B. Where duct work and beams will not allow a 12" baffle, provide small baffle with modified hanging system.
- C. Accessories: Provide threaded rods, clips, supports, and other accessory components as required for a complete system.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fabric, substrates, blocking, and conditions, with Installer present, for compliance with requirements, installation tolerances, and other conditions affecting performance of acoustical wall panels.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install acoustical wall panels in locations indicated with vertical surfaces and edges plumb, top edges level and in alignment with other panels, faces flush, and scribed to fit adjoining work accurately at borders and at penetrations.
- B. Comply with acoustical wall panel manufacturer's written instructions for installation of panels using type of concealed mounting accessories indicated or, if not indicated, as recommended by manufacturer. Anchor panels securely to supporting substrate.
- C. Match and level fabric pattern and grain among adjacent panels.
- D. Installation Tolerances: As follows:
 - 1. Variation from Level and Plumb: Plus or minus 1/16 inch.
 - 2. Variation of Panel Joints from Hairline: Not more than 1/16 inch wide.

3.3 CLEANING

- A. Clip loose threads; remove pills and extraneous materials.
- B. Clean panels with fabric facing, on completion of installation, to remove dust and other foreign materials according to manufacturer's written instructions.

3.4 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, to ensure that acoustical wall panels are without damage or deterioration at time of Substantial Completion.
- B. Replace acoustical wall panels that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION

SECTION 099000 - PAINTING AND COATING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Field painting of exposed interior items and surfaces.
 - 2. Field painting of exposed exterior items and surfaces.
 - 3. Surface preparation for painting.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 051200 STRUCTURAL STEEL FRAMING for shop priming structural steel.
 - 2. Section 055000 METAL FABRICATIONS for shop priming ferrous metal.
 - 3. Section 064020 INTERIOR ARCHITECTURAL WOODWORK for shop priming interior architectural woodwork.
 - 4. Section 078100 APPLIED FIREPROOFING for intumescent fire-resistive coatings.
 - 5. Section 081110 HOLLOW METAL FRAMES for factory priming steel doors and frames.
 - 6. Section 081400 FLUSH WOOD DOORS for factory finishing.
 - 7. Section 092110 GYPSUM BOARD ASSEMBLIES for surface preparation of gypsum board.

1.3 DEFINITIONS AND EXTENT

- A. General: Standard coating terms defined in ASTM D 16 apply to this Section.
 - 1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
 - 2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
 - 3. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
 - 4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.
- B. This Section includes surface preparation and field painting of exposed exterior and interior items and surfaces.
 - 1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

- C. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
 - 1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.
- D. Do NOT paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
 - 1. Prefinished items include the following factory-finished components:
 - a. Architectural woodwork.
 - b. Acoustical wall panels.
 - c. Toilet enclosures.
 - d. Metal lockers.
 - e. Kitchen appliances.
 - f. Elevator entrance doors and frames.
 - g. Elevator equipment.
 - h. Finished mechanical and electrical equipment.
 - i. Light fixtures.
 - 2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:
 - a. Foundation spaces.
 - b. Furred areas.
 - c. Ceiling plenums.
 - d. Utility tunnels.
 - e. Pipe spaces.
 - f. Duct shafts.
 - g. Elevator shafts.
 - 3. Finished metal surfaces include the following:
 - a. Anodized aluminum.
 - Stainless steel.
 - c. Chromium plate.
 - d. Copper and copper alloys.
 - e. Bronze and brass.
 - 4. Operating parts include moving parts of operating equipment and the following:
 - a. Valve and damper operators.
 - b. Linkages.
 - c. Sensing devices.
 - d. Motor and fan shafts.
 - 5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

1.4 SUBMITTALS

- A. Product Data: For each paint system indicated. Include block fillers and primers.
 - 1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
 - a. Disclose material ingredients by name and Chemical Abstract Service (CAS) Registry Number.
 - 2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.
- B. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.
 - 1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
 - 2. Provide a list of materials and applications for each coat of each Sample. Label each Sample for location and application.
 - 3. Submit two 8 inch by 12 inch Samples for each type of finish coating for Architect's review of color and texture only.
- C. Qualification Data: For Applicator.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.
- C. Mockups: Provide a full-coat benchmark finish sample for each type of coating and substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample Submittals.
 - 1. Architect will select one room or surface to represent surfaces and conditions for application of each type of coating and substrate.
 - a. Wall Surfaces: Provide samples on at least 100 sq. ft.
 - b. Small Areas and Items: Architect will designate items or areas required.
 - 2. Apply benchmark samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated. Provide required sheen, color, and texture on each surface.
 - a. After finishes are accepted, Architect will use the room or surface to evaluate coating systems of a similar nature.

3. Final approval of colors will be from benchmark samples.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
 - 1. Product name or title of material.
 - 2. Product description (generic classification or binder type).
 - 3. Manufacturer's stock number and date of manufacture.
 - 4. Contents by volume, for pigment and vehicle constituents.
 - 5. Thinning instructions.
 - 6. Application instructions.
 - 7. Color name and number.
 - 8. VOC content.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.
 - 1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

1.7 PROJECT CONDITIONS

- A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.
- B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F.
- C. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
 - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

1.8 EXTRA MATERIALS (ATTIC STOCK)

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: Furnish one unopened gallon of each type of paint and coating work, in color and gloss as used for the Project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work are listed in the Finish Schedule at the end of this Section.

2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
 - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- C. Paint Colors (PT-#): 10 colors as selected by Architect plus black and white.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.
 - 1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
 - 2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
 - Notify Architect about anticipated problems when using the materials specified over substrates primed by others.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.

- After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
 - 1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions and technical bulletins for each particular substrate condition and as specified.
 - 1. Provide barrier coats over incompatible primers or remove and reprime.
 - Cementitious Materials: Prepare concrete, concrete unit masonry, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - a. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
 - b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
 - c. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.
 - 3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
 - c. If transparent finish is required, backprime with clear sealer.
 - d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.
 - e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
 - 4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
 - a. Exterior Exposed Steel: Clean steel surfaces in accordance with SSPC-SP 6/NACE No. 3 Commercial Blast Cleaning. Abrasive blast cleaned surfaces shall exhibit a uniform, angular profile of 1.5-3.0 mils. Prime cleaned surfaces within 8 hours and prior to surface rusting.

- b. Interior Exposed Steel, in Humid Environments: Clean steel surfaces in accordance with SSPC-SP 6/NACE No. 3 Commercial Blast Cleaning. Abrasive blast cleaned surfaces shall exhibit a uniform, angular profile of 1.5-3.0 mils. Prime cleaned surfaces within 8 hours and prior to surface rusting.
- c. Interior Exposed Steel, in Dry Environments: Clean steel surfaces in accordance with SSPC-SP2 or SP3 Hand or Power Tool Cleaning.
- 5. Galvanized Surfaces: Clean galvanized surfaces in accordance with SSPC-SP16 Brush off Blast Cleaning of Galvanized Steel and NonFerrous Metals, to achieve a minimum 1 mil anchor profile.
- D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
 - Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 - 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 - 3. Use only thinners approved by paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
 - 1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
 - 2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 - 3. Provide finish coats that are compatible with primers used.
 - 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
 - 5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
 - 7. Paint backsides of access panels and removable or hinged covers to match exposed surfaces.
 - 8. Finish exterior doors and doors in wet areas on tops, bottoms, and side edges the same as exterior faces.
 - 9. Sand lightly between each succeeding enamel or varnish coat.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

- 1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
- 2. Omit primer over metal surfaces that have been shop primed and touchup painted.
- 3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
- 4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
 - 1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
 - 2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
 - 3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
- E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.
- F. Mechanical items to be painted include, but are not limited to, the following:
 - 1. Uninsulated metal piping.
 - 2. Uninsulated plastic piping.
 - 3. Pipe hangers and supports.
 - 4. Tanks that do not have factory-applied final finishes.
 - 5. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
 - 6. Duct, equipment, and pipe insulation having "all-service jacket" or other paintable jacket material.
 - 7. Mechanical equipment that is indicated to have a factory-primed finish for field painting.
- G. Electrical items to be painted include, but are not limited to, the following:
 - 1. Switchgear.
 - 2. Panelboards.
 - Electrical equipment that is indicated to have a factory-primed finish for field painting.
- H. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

- I. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- J. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque 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.
- K. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.
 - 1. Provide satin finish for final coats.
- L. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 FIELD QUALITY CONTROL

- A. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during the period when paint is being applied:
 - 1. The Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.
 - 2. Testing agency will perform appropriate tests for the following characteristics as required by the Architect.
 - 3. The Architect may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from Project site, pay for testing, and repaint surfaces previously coated with the noncomplying paint. If necessary, Contractor may be required to remove noncomplying paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
 - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.6 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.

1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.7 PAINT SCHEDULE

- A. Schedule: Provide products and number of coats specified. Use of manufacturer's proprietary product names to designate colors, materials, generic class, standard of quality and performance criteria and is not intended to imply that products named are required to be used to the exclusion of equivalent performing products of other manufacturers.
- B. Exterior Paint Schedule:
 - Exterior Galvanized Metal (not shop-finished under Section 051200 STRUCTURAL STEEL FRAMING, Section 055000 - METAL FABRICATIONS, Section 055100 - METAL STAIRS AND RAILINGS, and Section 081100 - HOLLOW METAL FRAMES), Alliphatic Acrylic Polyurethane System (Solvent-Based):
 - a. Surface Preparation: SSPC-SP16 Brush-off Blast of Galvanized Steel.
 - b. One Coat: Polyamide epoxy, high solids, low VOC, intermediate coat.
 - 1) AkzoNobel; International Intergard 475 HS at 5.0-10.0 mils DFT.
 - a) VOC: 207 g/L.
 - 2) Axalta (formerly Dupont); Corlar 2.1 ST at 3.0-5.0 mils DFT.
 - a) VOC: 240 g/L.
 - 3) PPG; PMC Amerlock 400 Hi-Build Epoxy at 4.0-5.0 mils DFT.
 - a) VOC: 180 g/L.
 - 4) Tnemec; V69 Hi-Build Epoxoline at 3.0 mils DFT (Basis of Design).
 - a) VOC: 234 g/L.
 - c. And One Coat: Aliphatic acrylic polyurethane, finish coat, semigloss.
 - 1) AkzoNobel; International Interthane 990V at 2.0-3.0 mils DFT.
 - a) VOC: 241 g/L. High gloss.
 - 2) Axalta (formerly Dupont); Imron 2.1 SG at 2.0-4.0 mils DFT.
 - a) VOC: 250 g/L. Semigloss.
 - 3) PPG; PMC Amercoat 450 HSG at 3.0 mils DFT.
 - a) VOC: 312 g/L. Semigloss.
 - 4) Tnemec; 1095 Endura-Shield at 3.0 mils DFT (Basis of Design).
 - a) VOC: 88 g/L. Semigloss.

- 2. Exterior Wood, for Stained Finish:
 - a. Two Coats:
 - 1) AkzoNobel; Sikkens, approved equal.
 - 2) Moore; approved equal.
 - 3) S-W; Cabot Water-Based Semi-Transparent Stain 1300.
- C. Interior Paint Schedule, Typical:
 - 1. Interior Gypsum Wallboard (GWB), Latex Paint Finish:
 - a. One Coat, Primer: MPI 50 X-Green and 149 X-Green.
 - 1) Moore; Ultra Spec 500 Interior Latex Primer N534.
 - 2) PPG; Pure Performance Interior Latex Primer 9-900.
 - 3) PPG; Speedhide Zero VOC Interior Primer 6-4900XI series.
 - 4) PPG; Speedhide Pro EV Zero VOC Interior Primer 12-900XI series.
 - 5) S-W; ProMar 200 HP Zero VOC Interior Primer.
 - And Two Coats, Flat Finish: At ceilings and elsewhere as indicated. MPI 53 X-Green.
 - 1) Moore; Ultra Spec 500 Interior Latex Flat T536.
 - 2) PPG; Speedhide Zero VOC Interior Latex Flat 6-4110XI series.
 - 3) PPG; Speedhide Pro EV Zero VOC Interior Latex Flat 12-110XI series.
 - 4) S-W; ProMar 400 HP Zero VOC Interior Flat.

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- And Two Coats, Eggshell Finish: At walls and elsewhere as indicated. MPI 144 X-Green.
 - 1) Moore; Ultra Spec 500 Interior Latex Eggshell T538.
 - 2) PPG; Speedhide Zero VOC Interior Latex Eggshell 6-4310XI series.
 - 3) PPG; Speedhide Pro EV Zero VOC Interior Latex Eggshell 12-110XI series.
 - 4) S-W; ProMar 200 HP Zero VOC Interior Eg-Shel.

or

- d. And Two Coats, Semi-Gloss Finish: At toilet rooms, other wet areas, and elsewhere as indicated. MPI 54 X-Green.
 - 1) Moore; Ultra Spec 500 Interior Latex Semi-Gloss T546.
 - 2) PPG; Speedhide Zero VOC Interior Latex Semi-Gloss 6-4510XI series.
 - 3) PPG; Speedhide Pro EV Zero VOC Interior Latex Semi-Gloss 12-110XI series.
 - 4) S-W; ProMar 200 HP Zero VOC Interior Semi-Gloss.
- 2. Interior Architectural Woodwork, Finish Carpentry, and Wood Doors (softwoods, paint grade hardwoods, MDF, MDO, and hardwood veneers), Latex Paint Finish:
 - a. One Coat, Primer:
 - 1) Moore; Ultra Spec 500 Interior Latex Primer N534.

- 2) PPG; Pure Performance Interior Latex Primer 9-900.
- 3) PPG; Seal Grip Interior/Exterior Acrylic Universal Primer/Sealer 17-921 series.
- 4) PPG; Speedhide Zero VOC Interior Primer 6-4900XI series.
- 5) PPG; Speedhide Pro EV Zero VOC Interior Primer 12-900XI series.
- 6) S-W; ProMar 200 HP Zero VOC Interior Primer.
- b. And Two Coats, Semi-Gloss:
 - 1) Moore; Ultra Spec 500 Interior Latex Semi-Gloss T546.
 - 2) PPG; Speedhide Zero VOC Interior Latex Semi-Gloss 6-4510XI.
 - 3) S-W; ProMar 200 HP Zero VOC Interior Semi-Gloss.
- 3. Interior Architectural Woodwork, Finish Carpentry and Millwork (hardwoods and hardwood veneers, except paint grade and factory-finished items), Transparent Polyurethane Finish:
 - a. Sand: 120 grit sandpaper.
 - b. Sand: 220 grit sandpaper.
 - c. One Coat, Stain: Not Used.
 - d. And Three Coats, Satin Finish:
 - 1) American Formulating & Manufacturing; Safecoat Polyureseal BP.
 - 2) Imperial Paints; ECOS Clear Varnish.
 - 3) Moore; Benwood Stays Clear Acrylic Polyurethane Low Lustre W423.
 - 4) PPG; DEFT water-based polyurethane 158.
 - 5) Vermont Natural Coatings; PolyWhey Natural Furniture Finish.
 - e. Sand Between Urethane Coats: 220 grit sandpaper.
- 4. Interior Concrete Masonry Unit (CMU), Latex Paint Finish:
 - a. One Coat, Block Filler:
 - 1) Moore; Ultra Spec Hi-Build Masonry Block Filler 571.
 - 2) PPG; Perma-Crete 4-603. Less than 100 g/L.
 - 3) PPG; Speedhide Interior Masonry Hi Fill Latex Block Filler 6-15XI.
 - 4) S-W; PrepRite Block Filler B25W25.
 - b. And Two Coats, Eggshell Finish: At walls and elsewhere as indicated.
 - 1) Moore; Ultra Spec 500 Interior Latex Eggshell T538.
 - 2) PPG; Speedhide Zero VOC Interior Latex Eggshell 6-4310XI series.
 - 3) S-W; ProMar 200 HP Zero VOC Interior Eg-Shel.
- 5. Interior Exposed Steel, Joists, Ductwork, Conduit and Similar Items (where indicated), Waterborne Dry-Fall or Dry-Fog Painted System:
 - a. One Coat:
 - 1) Moore; Latex Dry Fall Flat 395 at 2.5 to 3.0 mils DFT.
 - 2) PPG; Speedhide Super Tech WB Interior Dry-Fog Latex 6-725XI Flat at 2.0 to 2.5 mils DFT.

- S-W; WB Pro Industrial Waterborne Acrylic Dryfall Flat B42 series at 2.5 to 3.0 mils DFT.
- 4) Tnemec 115 WB Unibond DF at 2.5 to 3.0 mils DFT.
- 6. Interior Concrete Floor, Clear Exposed Sealer (Silicate type):
 - a. One Coat:
 - 1) Curecrete Chemical; Ashford Formula.
 - 2) Tnemec (Chem Probe); Series 629 CT Densifyer.
 - 3) WR Meadows; Liqui-Hard.
 - 4) Laticrete; L&M Seal Hard.
 - 5) Prosoco; Consolideck LS.
- D. Interior Paint Schedule, High Performance and Specialty Systems:
 - 1. Interior Gypsum Wallboard and Plaster at Laboratories, Toilet Rooms, and Other Wet Areas, Urethane Coating:
 - a. Surface Preparation: Cured, clean and dry, free of surface contaminants.
 - b. One Coat:
 - 1) Tnemec 201 Epoxoprime at 3.0- 4.0 mils DFT.
 - 2) PPG PMC Amerlock Sealer at 3.0 to 4.5 mils DFT.
 - 3) Dupont Hi-Solids Colar primer at 3.0 to 4.0 mils DFT.
 - 4) International Interseal 670 HS at 3.0 to 4.0 mils DFT.
 - c. And One Coat:
 - 1) Tnemec 280 Tneme-glaze at 6.0 to 8.0 mils DFT.
 - 2) PPG PMC Amercoat 351 Epoxy at 6.0 to 8.0 mils DFT.
 - 3) Dupont 100 % Solids Epoxy at 8.0-10.0 mils.
 - 4) International Interseal 670 HS at 3.0 to 4.0 mils DFT.
 - d. And One Coat:
 - 1) Tnemec 1080 or 1081 Endurashield WB at 3.0 to 3.5 mils DFT.
 - PPG PMC AmerShield VOC at 2.0 to 3.0 mils DFT.
 - 3) Dupont WB Urethane at 3.5 to 4.0 mils DFT.
 - 4) International Water Borne Urethane at 3.0 to 4.0 mils DFT.
 - 2. Interior Metals (Not specified to receive other coating systems/not shop finished), Acrylic Polymer Painted Finish:
 - a. One Coat: Approved primer, in shop under other Sections (where specified). If not shop primed, provide primer recommended by finish coating manufacturer.
 - b. And One Coat:
 - 1) Tnemec 1029 Enduratone at 2.0 mils DFT.
 - 2) PPG PMC Amerlock 400 at 2.0 to 4.0 mils DFT.
 - 3) Dupont 25P at 3.0 to 4.0 mils DFT.
 - 4) International Interseal 670 HS at 3.0 mils DFT.

- c. And One Coat:
 - 1) Tnemec 1029 Enduratone at 2.0 to 3.0 mils DFT.
 - 2) PPG PMC Amerlock 400 at 2.0 to 4.0 mils DFT.
 - 3) Dupont High Solids Acrylic Coating 3.0 mils DFT.
 - 4) International Intercryl 530 at 3.0 to 4.0 mils DFT.
- E. Mechanical and Electrical Work: Paint all exposed items throughout the project except factory finished items with factory-applied baked enamel finishes which occur in mechanical rooms or areas, and excepting chrome or nickel plating, stainless steel, and aluminum other than mill finished. Paint all exposed ductwork and inner portion of all ductwork. Same as specified for other interior metals, hereinabove.

END OF SECTION

SECTION 101100 - VISUAL DISPLAY SURFACES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Markerboards.
 - 2. Tackboards.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 064020 INTERIOR ARCHITECTURAL WOODWORK for custom wood trim for visual display surfaces.
 - 2. Section 099000 PAINTING AND COATING for primers under marker wall covering.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For each type of visual display surface indicated, for units with factory-applied color finishes, and as follows:
 - 1. Actual sections of visual display surfaces.
 - Fabric swatches fabric-faced tack assemblies.
- C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Show location of panel joints.
 - 2. Show location of special-purpose graphics for visual display surfaces.
 - 3. Include sections of typical trim members.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for surface-burning characteristics of fabrics.
- E. Maintenance Data: For visual display surfaces to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of visual display surface through one source from a single manufacturer.
- B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver factory-built visual display boards, including factory-applied trim where indicated, completely assembled in one piece without joints, where possible. If dimensions exceed maximum manufactured panel size, provide two or more pieces of equal length as acceptable to Architect. When overall dimensions require delivery in separate units, prefit components at the factory, disassemble for delivery, and make final joints at the site.
- B. Store visual display units vertically with packing materials between each unit.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating visual display surfaces without field measurements. Coordinate wall construction to ensure that actual dimensions correspond to established dimensions.
 - 2. Allow for trimming and fitting where taking field measurements before fabrication might delay the Work.

PART 2 - PRODUCTS

2.1 BASIS-OF-DESIGN

A. Basis-of-Design Products: Refer to the Finish Schedule on the Drawings.

2.2 MARKERBOARD ASSEMBLIES

- A. Porcelain-Enamel Markerboard Assembly: Balanced, high-pressure, factory-laminated markerboard assembly of 3-ply construction consisting of backing sheet, core material, and 0.021-inch-thick, porcelain-enamel face sheet.
 - 1. Available Manufacturers:

- a. AACRO Products, Inc.
- b. Claridge Products & Equipment, Inc.
- c. Peter Pepper Products.
- d. MooreCo; Best-Rite Manufacturing.
- e. Steelcase Company; PolyVision products.
- 2. Manufacturer's Standard Core: Minimum 1/4 inch thick, with manufacturer's standard moisture-barrier backing with binder containing no added urea formaldehyde.
- 3. Fire Rating: ASTM E 84, Class A.
- 4. Color: White, low gloss finish.
- 5. Laminating Adhesive: Manufacturer's standard moisture-resistant thermoplastic type.

2.3 TACKBOARD ASSEMBLIES

- A. Linoleum Resilient Tackboard: Uni-color linoleum resilient homogeneous tackable surface consisting of linseed oil, granulated cork, rosin binders and dry pigments calendared onto a natural burlap backing with integral color throughout with surfaceburning characteristics 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. Forbo Industries; Bulletin Board.
 - b. WallTalkers: Tac-wall.
 - 2. Thickness: 1/4 inch.
 - 3. Manufacturer's Standard Core: Minimum 1/4 inch thick, with manufacturer's standard backing with binder containing no added urea formaldehyde.
 - 4. Fire Rating: ASTM E 84, Class A.
 - 5. Colors: Refer to Finish Schedule.

2.4 ACCESSORIES

- A. Aluminum Frames and Trim: Factory-applied, fabricated from not less than 0.062-inch-thick, extruded aluminum; of size and shape indicated.
 - 1. Chalk/Marker Tray: Manufacturer's standard, continuous tray.
- B. Adhesive: Mildew-resistant, nonstaining adhesive, for use with specific visual display surfaces and substrate application, as recommended in writing by visual display surface manufacturer.
 - Adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.5 FABRICATION

- A. Porcelain-Enamel Visual Display Assemblies: Laminate porcelain-enamel face sheet and backing sheet to core material under heat and pressure with manufacturer's standard flexible, waterproof adhesive.
- B. Factory-Assembled Visual Display Units: Coordinate factory-assembled units with trim and accessories indicated. Join parts with a neat, precision fit.
- C. Aluminum Frames and Trim: Fabricate units straight and of single lengths, keeping joints to a minimum. Miter corners to neat, hairline closure.

2.6 ALUMINUM FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- D. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove dirt, scaling paint, projections, and depressions that will affect smooth, finished surfaces of visual display boards.
- B. Prepare surfaces to achieve a smooth, dry, clean surface free of flaking, unsound coatings, cracks, defects, and substances that will impair bond between visual display boards and surfaces.

3.3 INSTALLATION

- A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.
 - 1. Join adjacent wall panels with concealed steel splines for smooth alignment.
 - 2. Where markerboards abut, install with clean, trimless butt joints.

3.4 CLEANING AND PROTECTION

- A. Clean visual display surfaces according to manufacturer's written instructions. Attach one cleaning label to visual display surface in each room.
- B. Touch up factory-applied finishes to restore damaged or soiled areas.
- C. Cover and protect visual display surfaces after installation and cleaning.

END OF SECTION

SECTION 101400 - SIGNAGE

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Code-required interior panel signage, including but not limited to, room identification, directional, accessibility signage, toilet room signage and mechanical and electrical room signage.
 - 2. Building dedication plaque.
 - 3. Exterior building signage.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Division 26 ELECTRICAL for illuminated exit signs.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of sign.
- B. Shop Drawings: Include plans, elevations, and large-scale sections of typical members and other components. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.
 - 1. Provide message list for each sign, including large-scale details of wording, lettering, artwork, and braille layout.
- C. Samples for Verification: For each type of sign, include the following Samples to verify color selected:
 - 1. Panel Signs: Full-size Samples of each type of sign required.
 - 2. Plaques: Full-size Sample of each plaque.
 - a. Full-size Samples, if approved, will be returned to Contractor for use in the Project

- 3. Approved samples will not be returned for installation into Project.
- D. Maintenance Data: For signage cleaning and maintenance requirements to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each sign type through one source from a single manufacturer.
- B. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction.

1.5 PROJECT CONDITIONS

A. Field Measurements: Where sizes of signs are determined by dimensions of surfaces on which they are installed, verify dimensions by field measurement before fabrication and indicate measurements on Shop Drawings.

1.6 COORDINATION

A. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs.

PART 2 - PRODUCTS

2.1 SIGNS

- A. General: Provide signs that comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction as indicated. Produce smooth panel sign surfaces constructed to remain flat under installed conditions within tolerance of plus or minus 1/16 inch measured diagonally. Provide the following:
 - 1. Interior Panel Signs:
 - a. Type: Photopolymer on acrylic or printed acrylic / aluminum as applicable.
 - b. Color: Custom color as selected.
 - c. Type Size: As selected.
 - d. Typeface: As selected.
 - 2. Exterior Pin-Mounted Signs:
 - a. Type: Stainless steel, type 316.
- B. Tactile and Braille Copy: Manufacturer's standard process for producing copy complying with ADA Accessibility Guidelines and ICC/ANSI A117.1. Text shall be

accompanied by Grade 2 braille. Produce precisely formed characters with square cut edges free from burrs and cut marks.

- 1. Raised-Copy Thickness: Not less than 1/32 inch
- C. Symbols of Accessibility: Provide 6-inch- high symbol fabricated from opaque nonreflective vinyl film, 0.0035-inch nominal thickness, with pressure-sensitive adhesive backing suitable for both exterior and interior applications.

2.2 CAST METAL PLAQUES

A. Dedication Plaque:

- 1. General: Provide castings free from pits, scale, sand holes, and other defects.
- 2. Dimensions and Configuration: 36 inches wide aby 24 inches tall.
- 3. Thickness: 3/8 inch minimum.
- 4. Material: Cast Bronze.
- 5. Letters: Raised letters with polished faces, in type face as selected by the Architect.
- 6. Text: Layout and design, including border will be provided by the Architect in camera-ready form.
- 7. Finish:
- 8. Raised areas: Hand-tool and buff borders and raised copy to produce manufacturer's standard satin finish.
- 9. Background finish: Painted.
- 10. Cast metal plaque shall be installed by means of a concealed, vandal resistant fastening method, at an interior location.
- 11. Location: As selected by the Architect.

2.3 ACCESSORIES

- A. Mounting Methods: Use double-sided vinyl tape fabricated from materials that are not corrosive to sign material and mounting surface.
- B. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance.
 Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

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 work.

- B. Verify that items provided under other sections of Work are sized and located to accommodate signs.
- C. Examine supporting members to ensure that surfaces are at elevations indicated or required to comply with authorities having jurisdiction and are free from dirt and other deleterious matter.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Locate signs and accessories where indicated, using mounting methods of types described and in compliance with manufacturer's written instructions.
 - 1. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.
 - 2. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches of sign without encountering protruding objects or standing within swing of door.
- B. Wall-Mounted Panel Signs: Attach panel signs to wall surfaces using methods indicated below:
 - 1. Vinyl-Tape Mounting: Use double-sided foam tape to mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.

3.3 CLEANING AND PROTECTION

A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by the Architect.

END OF SECTION

SECTION 102110 - TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Solid plastic toilet compartments and screens, floor-mounted and overhead braced.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 102800 Toilet Accessories for partition mounted accessories.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Show locations of cutouts for compartment-mounted toilet accessories.
- C. Samples for Verification: Of each type of color and finish required for units, prepared on 6-inch-square Samples of same thickness and material indicated for Work.

1.4 QUALITY ASSURANCE

- A. Fire Hazard Classification: Passes NFPA 286.
- B. Regulatory Requirements: Comply with applicable provisions of Massachusetts Architectural Access Board and the Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG) for compartment door operating hardware and compartments designated as accessible."
- C. Regulatory Requirements: Comply with applicable provisions of ICC A117.1 and the Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and

Facilities (ADAAG) for compartment door operating hardware and compartments designated as accessible."

1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication and indicate measurements on Shop Drawings.
 - Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating toilet compartments without field measurements. Coordinate wall, floor, ceilings, and other contiguous construction to ensure that actual dimensions correspond to established dimensions.

1.6 COORDINATION

A. Coordinate with the work of Section 061000 - ROUGH CARPENTRY for locations requiring wood blocking or flat plate reinforcing within partitions for compartment mounting.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Accurate Partitions Corporation.
 - 2. General Partitions Mfg. Corp.
 - 3. Global Partitions.
 - 4. Scranton Products
- B. Basis of Design: Scranton; HDPE 1 inch thick.
 - 1. Color: Blueberry.

2.2 RECYCLED PLASTIC UNITS

- A. Stainless-Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness.
- B. Stainless-Steel Castings: ASTM A 743/A 743M.
- C. Door, Panel, and Pilaster Construction: Solid, recycled high-density polyethylene (HDPE) material, not less than 1 inch thick, seamless, with eased edges, and with homogenous color and pattern throughout thickness of material.

- 1. Color and Pattern: One color and pattern in each room as selected by Architect from manufacturer's full range of colors and patterns.
- D. Brackets and Fittings: Manufacturer's standard designs.
 - 1. Material: Stainless steel.
 - 2. Full-Height (Continuous) Type Brackets: Stainless steel.
 - 3. Stainless-Steel Finish: No. 4 bright, directional polish on exposed faces. Protect exposed surfaces from damage by application of strippable, temporary protective covering before shipment.

2.3 ACCESSORIES

- A. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories.
 - 1. Material: Stainless steel.
 - 2. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories.
- B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.
- C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel or chrome-plated steel or brass, finished to match hardware, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use hot-dip galvanized or other rust-resistant, protective-coated steel.

2.4 FABRICATION

- A. Floor-Mounted, Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.
- B. Ceiling-Hung Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at pilasters for connection to structural support above finished ceiling. Provide assemblies that support pilasters from structure without transmitting load to finished ceiling. Provide sleeves (caps) at tops of pilasters to conceal anchorage.
- C. Door Size and Swings: Unless otherwise indicated, provide 24-inch-wide, in-swinging doors for standard toilet compartments and 36-inch-wide, out-swinging doors with a minimum 32-inch-wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
 - 1. Maximum Clearances:
 - a. Pilasters and Panels: 1/2 inch.
 - b. Panels and Walls: 1 inch.
 - 2. Full-Height (Continuous) Brackets: Secure panels to walls and to pilasters with full-height brackets.
 - a. Locate bracket fasteners so holes for wall anchors occur in masonry or tile joints.
 - b. Align brackets at pilasters with brackets at walls.
- B. Floor-Mounted, Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two fasteners. Hang doors to align tops of doors with tops of panels, and adjust so tops of doors are parallel with overhead brace when doors are in closed position.
- C. Ceiling-Hung Units: Secure pilasters to supporting structure and level, plumb, and tighten. Hang doors and adjust so bottoms of doors are level with bottoms of pilasters when doors are in closed position.
- D. Wall-Hung Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb and to resist lateral impact.

3.2 ADJUSTING

A. Hardware Adjustment: Adjust and lubricate hardware according to manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors and doors in entrance screens to return doors to fully closed position.

SECTION 102220 - FOLDING PANEL PARTITIONS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Electrically-operated, continuously hinged panel partitions.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 055000 METAL FABRICATIONS for framing and supports.
 - 2. Section 061000 ROUGH CARPENTRY for concealed blocking.
 - 3. Division 26 ELECTRICAL for electrical service and connections for motor operators, controls, and limit switches; and for system disconnect switches.

1.3 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Provide operable panel partitions capable of withstanding the effects of earthquake motions determined according to Code requirements.
- B. Acoustical Performance: Provide operable panel partitions tested by a qualified testing agency for the following acoustical properties according to test methods indicated:
 - 1. Sound Transmission Requirements: Operable panel partition assembly tested in a full-scale opening, 14 by 9 feet for laboratory sound transmission loss performance according to ASTM E 90, determined by ASTM E 413, and rated for not less than the STC indicated.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Indicate storage and operating clearances. Indicate location and installation requirements for hardware and track, blocking, and direction of travel.

- 2. Wiring Diagrams: Power, signal, and control wiring.
- C. Coordination Drawings: Reflected ceiling 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. Suspended ceiling components.
 - 2. Structural members to which suspension systems will be attached.
 - 3. Size and location of initial access modules for acoustical tile.
 - 4. Items penetrating finished ceiling, including the following:
 - a. Lighting fixtures.
 - b. Air outlets and inlets.
 - c. Speakers.
 - d. Sprinklers.
 - e. Access panels.
- D. Setting Drawings: For embedded items and cutouts required in other work, including support-beam punching template.
- E. Samples for Verification: For each type of finish, covering, or facing indicated, prepared on Samples of size indicated below.
 - Applied Facing: Full width by not less than 8-inch-long section of fabric from dye
 lot to be used for the Work, with specified treatments applied. Show complete
 pattern repeat.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a certified testing agency, for each operable panel partition.
- G. Maintenance Data: For operable panel partitions to include in maintenance manuals.
 - 1. Panel finish facings and finishes for exposed trim and accessories. Include precautions for cleaning materials and methods that could be detrimental to finishes and performance.
 - 2. Seals, hardware, track, carriers, and other operating components.
 - 3. For electric operator.
- H. Warranty: Special warranty specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Fire-Test-Response Characteristics: Provide operable panel partitions with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:

- 1. Flame-Spread Index: 25 or less.
- 2. Smoke-Developed Index: 450 or less.
- C. 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.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protectively package and sequence panels in order for installation. Clearly mark packages and panels with numbering system used on Shop Drawings. Do not use permanent markings on panels.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify operable panel partition openings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of operable panel partitions that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Faulty operation of operable panel partitions.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal wear.
 - 2. Panel Warranty Period: Two years from date of Substantial Completion.
 - 3. Track Warranty Period: Five years from date of Substantial Completion.

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, the following:
 - 1. Hufcor, Inc.
 - 2. Moderco.
 - 3. Modernfold.

2.2 MATERIALS

- A. Steel Frame: Steel sheet, manufacturer's standard nominal specified thickness for uncoated steel.
- B. Steel Face/Liner Sheets: Tension-leveled steel sheet, manufacturer's standard thickness.
- C. Gypsum Board: ASTM C 1396.

2.3 OPERABLE PANELS

- A. Panel Construction: Provide top reinforcement as required to support panel from suspension components and provide reinforcement for hardware attachment. Fabricate panels with tight hairline joints and concealed fasteners. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.
- B. Dimensions: Fabricate operable panel partitions to form an assembled system of dimensions indicated and verified by field measurements.
- C. STC: Not less than 50.
- D. Panel Closure: Manufacturer's standard.
- E. Hardware: Manufacturer's standard as required to operate operable panel partition and accessories; with decorative, protective finish.

2.4 SEALS

- A. General: Provide types of acoustical seals indicated that produce operable panel partitions complying with acoustical performance requirements and the following:
 - 1. Manufacturer's standard seals.
 - 2. Seals made from materials and in profiles that minimize sound leakage.
 - 3. Seals fitting tight at contact surfaces and sealing continuously between adjacent panels and between operable panel partition perimeter and adjacent surfaces, when operable panel partition is extended and closed.
- B. Vertical Seals: Deep-nesting, interlocking astragals mounted on each edge of panel, with continuous PVC acoustical seal.
- C. Horizontal Bottom Seals: PVC-faced, mechanical, retractable, constant-force-contact seal exerting uniform constant pressure on floor when extended, ensuring horizontal and vertical sealing and resisting panel movement.

1. Automatically Operated: Extension and retraction of bottom seal automatically operated by movement of partition, with operating range not less than 2-inches between retracted seal and floor finish.

2.5 FINISH FACING

- A. General: Provide finish facings that comply with indicated fire-test-response characteristics and that are factory applied to operable panel partitions with appropriate backing, using mildew-resistant nonstaining adhesive as recommended by facing manufacturer's written instructions.
- B. Vinyl-Coated Fabric Wall Covering: Lentex ,Honey Maple #593, Type II 20 oz.
- C. Trimless Edges: Fabricate exposed panel edges so finish facing wraps uninterrupted around panel, covering edge and resulting in an installed partition with facing visible on vertical panel edges, without trim, for minimal sightlines at panel-to-panel joints.

2.6 SUSPENSION SYSTEMS

- A. Suspension Tracks: Steel or aluminum adjustable steel hanger rods for overhead support, designed for type of operation, size, and weight of operable panel partition indicated. Size track to support partition operation and storage without damage to suspension system, operable panel partitions, or adjacent construction. Limit track deflection to no more than 0.10 inch between bracket supports. Provide a continuous system of track sections and accessories to accommodate configuration and layout indicated for partition operation and storage.
- B. Carriers: Trolley system as required for configuration type, size, and weight of partition and for easy operation; with ball-bearing wheels.
- C. Track Intersections, Switches, and Accessories: As required for type of operation, storage, track configuration, and layout indicated for operable panel partitions, and compatible with partition assembly specified. Fabricate track intersections and switches from steel or aluminum.
- D. Aluminum Finish: Mill finish or manufacturer's standard, factory-applied, decorative finish, unless otherwise indicated.
- E. Steel Finish: Factory-applied, corrosion-resistant, protective coating, unless otherwise indicated.

2.7 ELECTRIC OPERATORS

A. General: Provide factory-assembled electric operation system of size and capacity recommended and provided by operable panel partition manufacturer for partition specified; with electric motor and factory-prewired motor controls, speed reducer, chain drive, remote-control stations, control devices, and accessories required for proper operation. Include wiring from motor control to motor. Coordinate operator wiring requirements and electrical characteristics with building electrical system.

- B. Comply with NFPA 70.
- C. Control Equipment: Complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6.
- D. Motor Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, within installed environment, with indicated operating sequence, and without exceeding nameplate rating or considering service factor. Comply with NEMA MG 1.
- E. Remote-Control Stations: Two single-key-operated, constant-pressure control stations located remotely from each other on opposite sides and opposite ends of partition run. Wire in series to require simultaneous activation of both key stations to operate partition. Each three-position control station labeled "Open," "Close," and "[Off] [Stop]." Provide two keys per station.
- F. Obstruction-Detection Devices: Provide each motorized operable panel partition with automatic safety sensor indicated. Activation of sensor causes operator to immediately shut off motor.
 - 1. Sensor Edge: Contact-pressure-sensitive safety edge along partition's leading edge.
- G. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop operable panel partition at fully extended and fully stacked positions.

2.8 ACCESSORIES

- A. Pass Doors: Fabricated to comply with recommendations in Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)." Swinging door built into and matching panel materials, construction, acoustical qualities, finish, and thickness, complete with frames and operating hardware. Hinges finished to match other exposed hardware.
 - 1. Single Pass Door: 36 by 80 inches with the following:
 - a. Door Seals: Mechanically operated floor seal on panels containing pass doors.
 - b. Door Hardware: Provide panic hardware, concealed door closers, and other hardware components as required and as indicated on drawings.
 - c. Exit Sign: Recessed, self-illuminated.
 - d. Lock: Key-operated lock cylinder, keyed to master key system, operable from both sides of door. Include two keys per lock.
- B. Electric Interlock: Provide each motorized operable panel partition with electric interlocks at locations indicated, to prevent operation of operable partition under the following conditions:
 - 1. On pocket door, to prevent operation if pocket door is not in fully open position.

2. On partitions at location of convergence by another partition, to prevent operation if merging partitions are in place.

2.9 SAFETY DEVICES

- A. Obstruction Detection Devices System: Equip each motorized operable panel partition with automatic safety sensor that causes operator to immediately shut off motor and stop, and sound an alarm. For continued operation of the partition, the system shall be manually re-armed by key switch. Upon completion the safety system shall comply with the New York State Education Department requirements and regulations contained in Regulations of the Commissioner Part 155.25.
 - 1. Infrared Sensor System: Designed to detect an obstruction in partition's path and sound an audible alarm, without obstruction contacting partition.
 - 2. Components of Safety Device:
 - a. Passive Infrared Detectors shall be "OPTEX" Model #SP-80 AM High Sensitivity (PIR) Device for partition sensors and Model #SP-40SS (PIR) for pocket/stack sensors; self-contained, self-monitoring circuit operating on 12 VDC input power with adjustable integra anti-masking features capable of automatic fail to safe condition function optics.
 - b. Passive infrared detector guards (housing) shall be constructed of sheet metal with white baked enamel finish, independently fastened to wall or ceiling surfaces.
 - c. Keyed reset switches mounted one on each side of stacked panels. Provide two sets of keys.
 - d. Lockable system control panel (SCP).
 - e. Alarm warning device; Sound Bomb Type PIEZO warning device alert with 100 decibels output, and high and low settings.
 - 3. Safety devices system shall be designed to work as an integral part of the operable partition system. Infrared beams shall span the entire path of the partition on both sides, with a minimum of four sensors used, two on each side. Two sensors shall be mounted at the entrance to pocketed areas and/or behind stacked panels. Pocket/stack sensors shall detect the presence of an obstruction at any time (whether the partition is in operation or at rest) and render the partition inoperable.
 - 4. Safety device system shall be designed and installed in a fail safe manner where the failure of any devices shall render the electrically operated partition inoperable until such device is repaired.
 - 5. Basis of Design Product: Safe Path System by Safe Path Systems, LLC or equal.

2.10 SIGNAGE FOR SAFE OPERATING PROCEDURES

A. Provide signage as indicated below at every operating station/key switch in compliance with NYSED requirements.

WARNING

Electrically powered partition

Only appropriately trained staff may operate this partition

Control stations must be attended by staff members while the partition is in motion Staff members must stand on opposite sides of the partition during stacking and extending procedure

Students must stay away from partition while in motion

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine flooring, structural support, and opening, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of operable panel partitions.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Comply with operable panel partition manufacturer's written installation instructions.
- B. Install operable panel partitions and accessories after other finishing operations, including painting, have been completed.
- C. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.

3.3 ADJUSTING

- A. Adjust operable panel partitions to operate smoothly, without warping or binding. Lubricate hardware, electric operator, and other moving parts.
- B. Adjust pass doors and pocket doors to operate smoothly and easily, without binding or warping. Check and readjust operating hardware. Confirm that latches and locks engage accurately and securely without forcing or binding.

3.4 FIELD QUALITY CONTROL

- A. Light Leakage Test: Illuminate one side of partition installation and observe vertical joints and top and bottom seals for voids; adjust partitions for acceptable fit.
- B. NIC Testing: The Owner may engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- C. Testing Methodology: Perform testing of installed operable panel partition for noise isolation according to ASTM E 336, determined by ASTM E 413, and rated for not less than the NIC indicated. Adjust and fit partitions to comply with NIC test method requirements.

- D. Testing Extent: Testing agency shall randomly select one operable panel partition installation(s) for testing.
- E. Repair or replace operable panel partitions within areas where test results indicate partitions do not comply with requirements, and retest partitions.
- F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of repaired, replaced, or additional work with specified requirements.

3.5 CLEANING

A. Clean soiled surfaces of operable panel partitions to remove dust, loose fibers, fingerprints, adhesives, and other foreign materials according to manufacturer's written instructions.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train the Owner Project Manager's maintenance personnel to adjust, operate, and maintain operable panel partitions.

SECTION 102600 - WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Corner guards.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - Section 055000 METAL FABRICATIONS.
 - 2. Section 087100 DOOR HARDWARE for metal armor, kick, mop, and push plates.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
 - 1. Corner Guards: 12 inches long.
- C. Maintenance Data: For each impact-resistant wall protection unit to include in maintenance manuals.
 - Include recommended methods and frequency of maintenance for maintaining optimum condition of plastic covers under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to plastic finishes and performance.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain impact-resistant wall protection units from single source from single manufacturer.

- B. Product Options: Drawings indicate size, profiles, and dimensional requirements of impact-resistant wall protection units and are based on the specific system indicated. Refer to Division 01 Sections.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store impact-resistant wall protection units in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.
 - 1. Maintain room temperature within storage area at not less than 70 deg F during the period plastic materials are stored.
 - 2. Keep plastic sheet material out of direct sunlight.
 - 3. Store plastic wall protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install impact-resistant wall protection units until building is enclosed and weatherproof, wet work is complete and dry, and HVAC system is operating and maintaining temperature at 70 deg F for not less than 72 hours before beginning installation and for the remainder of the construction period.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Stainless-Steel Sheet: ASTM A 240/A 240M.
- B. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.
- C. Adhesive: Type recommended by manufacturer for use with material being adhered to substrate indicated.
- D. Adhesives, General: Do not use adhesives that contain urea formaldehyde.
- E. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Wood Glues: 30 g/L.
 - 2. Contact Adhesive: 80 g/L.

3. Special Purpose Contact Adhesive: 250 g/L.

2.2 CORNER GUARDS

- A. Surface-Mounted, Metal Corner Guards: Fabricated from 1-piece, formed or extruded metal with formed edges; with 90- or 135-degree turn to match wall condition.
 - 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. Balco, Inc.
 - b. Boston Retail Products.
 - c. Construction Specialties, Inc.
 - d. IPC Door and Wall Protection Systems; Division of InPro Corporation.
 - e. Korogard Wall Protection Systems; Division of RJF International Corporation.
 - f. Nystrom Building Products.
 - g. Pawling Corporation.
 - 2. Material: Stainless steel, Type 304.
 - a. Thickness: Minimum 0.0781 inch.
 - b. Finish: Directional satin, No. 4.
 - 3. Wing Size: Nominal 3-1/2 by 3-1/2 inches.
 - 4. Corner Radius: 1/8 inch.
 - 5. Mounting: Flat-head, countersunk screws through factory-drilled mounting holes.

2.3 FABRICATION

- A. Fabricate impact-resistant wall protection units to comply with requirements indicated for design, dimensions, and member sizes, including thicknesses of components.
- B. Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.
- C. Fabricate components with tight seams and joints with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

2.4 METAL FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Remove tool and die marks and stretch lines or blend into finish.

- 2. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
- B. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
- C. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.5 STAINLESS-STEEL FINISHES

- A. Remove tool and die marks and stretch lines or blend into finish.
- B. Grind and polish surfaces to produce uniform, polished finish indicated, free of cross scratches.
 - 1. Run grain of directionally textured finishes with long dimension of each piece.
- C. Directional Satin Finish: No. 4 finish.
- D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Examine walls to which impact-resistant wall protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Complete finishing operations, including painting, before installing impact-resistant wall protection system components.
- B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

- A. General: Install impact-resistant wall protection units level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.
 - 1. Provide mounting hardware, anchors, and other accessories required for a complete installation.

3.4 CLEANING

A. Immediately after completion of installation, clean plastic covers and accessories using a low VOC, non-ammonia-, non-chlorine, and non-solvent-based, household cleaning agent.

SECTION 102800 - TOILET ACCESSORIES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Grab Bars.
 - 2. Mirrors.
 - 3. Toilet accessories provided by Owner to be installed by Contractor. Coordinate with Owner for accessories provided by Owner.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 061000 ROUGH CARPENTRY for blocking.
 - 2. Section 088000 GLAZING for frameless mirrors.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include the following:
 - 1. Construction details and dimensions.
 - 2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 - 3. Material and finish descriptions.
 - 4. Features that will be included for Project.
 - 5. Manufacturer's warranty.
- B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
 - 1. Identify locations using room designations indicated on Drawings.
 - 2. Identify products using designations indicated on Drawings.
- C. Maintenance Data: For toilet accessories to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same articles in Part 2, provide products of same manufacturer unless otherwise approved by Architect.

1.5 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Provide the following:

1. Grab Bars:

- a. Stainless Steel Type: Provide grab bars with wall thickness not less than 18 gage (1.27 mm thick), concealed mounting with snap lock covers, satin finish, 1-1/2-inch (38.1 mm) clearance between wall surface and inside face of bar, outside diameter of 1-1/4 inches (32 mm); dimensions and configurations as indicated on Contract Drawings.
- b. Basis of Design: Bobrick Series B-5806 or approved equivalent.

2. Mirrors:

- a. Stainless Steel Framed Mirror Units: Fabricate frame from 1/2 by 1/2 by 3/8 inch channel shapes with square corners mitered, welded, and ground smooth, from satin-finished stainless.
- b. Provide shock absorbing strips and perimeter frame and for full size of back, with galvanized steel back, concealed wall hanger and theft-proof fasteners. Mirror shall be fully tempered glass.
- c. Basis of Design: Bobrick B-2908, or approved equivalent.
 - 1) Sizes: 2'-0"w x 3'-0"h.

2.2 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to the Owner.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to method in ASTM F 446.

3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

SECTION 104100 - EMERGENCY ACCESS AND INFORMATION CABINETS

PART 1 - GENERAL

1.1 **GENERAL PROVISIONS**

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- Α. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Fire department key vault box.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 042000 - UNIT MASONRY for substrate.
 - 2. Section 061000 - ROUGH CARPENTRY for wood blocking.

1.3 **SUBMITTALS**

- Product Data: Submit manufacturer's product data, installation instructions, use limitations and Α. recommendations for each product and system used. Provide manufacturer's certifications stating that products and systems comply with requirements.
- Shop Drawings: Provide large scale shop drawings for fabrication, installation and erection of all B. parts of the work. Provide plans, elevations, and details of anchorage, connections and accessory items. Provide installation templates for work installed by others.
- Contractor's Review: Before commencing work, submit signed statement that Contract C. Documents have been reviewed with a qualified representative of supplier/manufacturer, and that selected materials and construction are proper, compatible, and adequate for application shown.

PART 2 - PRODUCTS

2.1 FIRE DEPARTMENT KEY VAULT BOX

- A. Fire Department Key Vault Box: Provide at building entrance; location shall be acceptable to local Fire Department.
 - Basis of Design: Knox Company; Model 3200 Knox-Box, Recessed Mounted Type. 1.
 - Finish: Weather resistant TGIC polyester powder coat, color as selected by local Fire 2.
 - 3. Locking: Provide lock and keys acceptable to local Fire Department.
 - Building Alarm Interface: Provide tamper switch interface with building alarm system. 4.

Accessories:

- a. Provide manufacturer's standard recessed mounting kit, for installation in specified construction.
- b. Provide alarm tamper switches, UL listed.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Rough-In Work: Examine installation of walls and other conditions under which work is to be installed; verify dimensions of services and substrates before fabricating work.
- B. Notify Contractor of unsatisfactory locations and dimensions of other work and of unsatisfactory conditions for proper installation of equipment. Do not proceed with fabrication and installation until unsatisfactory dimensions and conditions have been corrected in manner satisfactory to Installer.

3.2 FIRE DEPARTMENT KNOX BOX INSTALLATION

- A. General: Set each item of equipment securely in place, level, and adjust to correct height, 4 ft. 0 in. AFF, unless otherwise required by local Fire Department.
- B. Anchor to supporting substrate where indicated and where required for sustained operation and use without shifting or dislocation. Conceal anchorage where possible. Seal perimeter joints in accordance with Section 079200 JOINT SEALANTS.

3.3 CLEANING

A. After completion of installation and other major work remove protective coverings, if any, and clean equipment, internally and externally. Restore exposed and semi-exposed finishes to remove abrasions and other damages; polish exposed-metal surfaces and touch-up painted surfaces. Replace work that cannot be successfully restored.

SECTION 104313 - AUTOMATIC EXTERNAL DEFIBRILLATOR (AED) CABINETS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Automatic external defibrillator (AED) cabinets.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 061000 ROUGH CARPENTRY for wood blocking.

1.3 COORDINATION

- A. Coordinate size of AED cabinets to ensure compatibility with Owner-furnished AED devices.
- B. Coordinate fire-rating of AED cabinets with fire-rated partitions to ensure partition fire-rating is maintained.

1.4 SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
 - 1. Show locations and details for installing electrical wiring, alarm and monitoring components and switches.
 - 2. Wiring Diagrams: Power, alarm and monitoring wiring.

1.5 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

- B. Source Limitations: Obtain AED cabinets through one source from a single manufacturer.
- C. Fire-Rated AED Cabinets: Listed and labeled to comply with requirements of ASTM E 814 for fire-resistance rating of walls where they are installed.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and protect defibrillator cabinets and related materials using means and methods that will prevent damage, deterioration, or loss.
- B. Deliver components in manufacturer's original packaging, properly labeled for identification.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, products which may be incorporated into the Work include, but are not limited to, the following:
 - 1. JL Industries, Inc.
 - 2. Larsen's Manufacturing Company.
 - 3. Potter Roemer; Div. of Smith Industries, Inc.
 - 4. Zoll Medical Corporation.
- B. Basis-of-Design: Subject to compliance with requirements, provide JL Industries 1400 Series Lifestart Series recessed AED cabinets, or comparable products from available manufacturers, as approved by Architect.
 - 1. Cabinet Style: Recessed.
 - 2. Size: 14 inches high by 14 inches wide by 6-3/4 inches deep, unless otherwise indicated.
 - 3. Components:
 - a. Tub Material: Stainless steel.
 - b. Tub Material: Cold-rolled steel.
 - c. Door and Trim Construction: Flush doors with 5/8 inch door stop attached by continuous hinge and equipped with zinc-plated with roller catch.
 - 1) Finish: Factory-applied ground and polished finish; #4 directional satin finish.
 - 2) Finish: Factory-applied powder coat finish; color as selected by Architect from manufacturer's full range.
 - 3) Door Style: Fully-tempered glazing; pull and AED signage.
 - d. Trim Style and Depth: 3/8-inch flat trim.
 - e. Trim Dimensions: 1-3/4 inch face trim on door and frame.
 - 4. Fire Rating: As indicated for partition type on Drawings.

5. Cabinet Lettering: AED identifying decal, as selected by Architect from manufacturer's full line.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls and partitions for suitable framing depth and blocking where recessed and semi-recessed cabinets will be installed, and blocking where surface mounted cabinets will be installed.
 - 1. Notify the Architect, in writing of conditions detrimental to detrimental to proper and timely completion of the installation.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Install cabinets in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.
 - 1. Prepare recesses in walls for defibrillator cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.
 - 2. Securely fasten cabinets to structure, square and plumb, to comply with manufacturer's instructions.
 - 3. Maintain fire ratings where cabinets are recessed into fire-rated wall systems.
- C. Cabinet Lettering: Install on face of glass surface.

3.3 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as defibrillator cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. Adjust cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.
- C. On completion of cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- D. Touch up marred finishes, or replace cabinets that cannot be restored to factory finished appearance. Use only materials and procedures recommended or furnished by cabinet manufacturer.

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E. Replace cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

SECTION 104400 - FIRE-PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Portable fire extinguishers.
 - 2. Fire-protection cabinets for portable fire extinguishers.
 - 3. Mounting brackets for fire extinguishers.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 099000 PAINTING AND COATING for field painting fire-protection cabinets.
 - 2. Division 21 FIRE PROTECTION for fire hose valves and standpipes.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each item.
 - 1. Fire Extinguishers: Include rating and classification.
 - 2. Fire-Protection Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.
- B. Maintenance Data: For fire extinguishers and fire-protection cabinets to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain fire extinguishers and fire-protection cabinets through one source from a single manufacturer.
- B. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

- C. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
- D. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements of ASTM E 814 for fire-resistance rating of walls where they are installed.

1.5 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

PART 2 - PRODUCTS

2.1 PORTABLE FIRE EXTINGUISHERS

- A. General: Provide fire extinguishers of type, size, and capacity for each fire-protection cabinet and mounting bracket indicated.
- B. Multipurpose Dry-Chemical Type in Steel Container: UL-rated 2-A:10-B:C, 5-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

2.2 FIRE-PROTECTION CABINET

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. JL Industries, Inc.
 - 2. Larsen's Manufacturing Company.
 - 3. Nystrom Building Products.
 - 4. Potter Roemer; Div. of Smith Industries, Inc.
- B. Cabinet Type: Suitable for fire extinguisher.
- C. Cabinet Material: Stainless steel sheet.
- D. Semirecessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
 - 1. Square-Edge Trim: 1-1/4- to 1-1/2-inch backbend depth.
- E. Door Material: Stainless steel sheet.
- F. Door Style: Vertical duo panel with frame.
- G. Door Glazing: Tempered glass.

H. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

I. Accessories:

- 1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
- 2. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.

2.3 MOUNTING BRACKETS

- A. Mounting Brackets: Manufacturer's standard steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
- B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.

2.4 FABRICATION

- A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub), with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
 - 1. Weld joints and grind smooth.
 - 2. Construct fire-rated cabinets with double walls fabricated from 0.0428-inch-thick, cold-rolled steel sheet lined with minimum 5/8-inch-thick, fire-barrier material.
 - a. Provide factory-drilled mounting holes.
- B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.
 - 1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.
 - 2. Miter and weld perimeter door frames.
- C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.5 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

- C. Finish fire-protection cabinets after assembly.
- D. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls and partitions for suitable framing depth and blocking where recessed cabinets will be installed.
- B. Examine fire extinguishers for proper charging and tagging. Contractor shall be responsible for fire extinguisher tagging by a certified service technician located within 75 miles of the project.
 - 1. Remove and replace damaged, defective, or undercharged units.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare recesses for recessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

- A. General: Install fire-protection specialties in locations and at mounting heights indicated on the Drawings and acceptable to authorities having jurisdiction.
- B. Fire-Protection Cabinets: Fasten fire-protection cabinets to structure, square and plumb.
 - Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is not adequate for recessed cabinets, provide semirecessed fireprotection cabinets.
 - 2. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.
- C. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.
- D. Identification: Apply vinyl lettering at locations indicated.

3.4 INSTALLATION OF FIRE-RATED CABINETS

- A. Install cabinet with not more than 1/16-inch tolerance between pipe OD and knockout OD. Center pipe within knockout.
- B. Seal through penetrations with firestopping sealant as specified in Section 078410 PENETRATION FIRESTOPPING.

3.5 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as fire-protection specialties are installed, unless otherwise indicated in manufacturer's written installation instructions.
- B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.
- C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet manufacturer.
- E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

SECTION 110630 - STAGE CURTAINS

PART 1 - PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: This Section includes stage curtain rigging and the following types of stage curtains:
 - Theatrical curtains including curtains, valances, and tormentors, and reuse of existing curtains and hardware.
 - Accessories.

1.3 RELATED WORK

- A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:
 - 1. Section 055000 METAL FABRICATIONS for supplementary members supporting stage curtain systems to structure.
 - 2. Division 26 ELECTRICAL; Electrical wiring, connections, and installing remote-control switches for draw-curtain machines.

1.4 SUBMITTALS

- A. Product Data: Include types, styles, materials, operating instructions, and maintenance recommendations.
- B. Shop Drawings: Include plans, elevations, and detail sections of typical track and rigging elements. Show anchors, hardware, operating equipment, and other components not included in manufacturer's Product Data. Include the following:
 - 1. Locations for blocking to be provided by others.
 - 2. Extent of required operating clearances.
 - 3. Calculations: Calculate requirements for supporting curtains, track, and equipment and verify capacity of each curtain, track, and rigging component to support loads.
 - 4. Locations of equipment components, switches, and controls.
 - 5. Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer-installed and field-installed wiring.
- C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors, textures, and patterns available, together with 12-inch-(300-mm-) square sample (any color) of each type fabric.

- 1. Samples for Verification: Not less than 36 inches(900 mm) square of each fabric from dye lot to be used for the Work, with specified treatments applied, and showing complete pattern repeat, if any. Mark top and face of fabric.
- 2. Product Certificates: Signed by manufacturers of stage curtains certifying that products furnished comply with requirements. Give name of flame-retardant chemical used, identification of applicator, treatment method, application date, allowable life span for treatment, and details of any restrictions and limitations.
- 3. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed installation of stage curtains similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Fire-Test-Response Characteristics: Provide stage curtains with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or a testing and inspecting agency acceptable to authorities having jurisdiction. Permanently attach label to each fabric of curtain assembly indicating whether fabric is inherently and permanently flame resistant, or treated with flame-retardant chemicals, and whether it will require retreatment after designated time period or cleaning.
- C. Flame-Resistance Ratings: Passes NFPA 701.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify stage curtain openings and dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening and construction dimensions and proceed with fabricating stage curtains without field measurements. Coordinate construction to ensure that actual opening and construction dimensions correspond to established dimensions.

PART 2 - PART 2 - PRODUCTS

2.1 CURTAIN FABRICS

- A. General: Provide fabrics inherently and permanently flame resistant or chemically flame resistant by immersion treatment to comply with requirements indicated. Provide fabrics from the same dye lot.
- B. Products: Subject to compliance with requirements, provide products of one of the following:
 - 1. Fred Kreiger Fabrics Renaissance Velour 22 oz. IFR, recycled.

- a. Colors, Textures, and Patterns: Liberty Blue
- b. Lining: Yarn-dyed denim cloth of 100 percent cotton; woven in a warp-faced twill; 54-inch minimum width.

2.2 CURTAIN FABRICATION

- A. General: Affix permanent label, stating compliance with requirements of authorities having jurisdiction, in accessible location on curtain not visible to audience. Provide vertical seams, unless otherwise indicated. Arrange vertical seams so they do not fall on faces of pleats. Do not use fabric cuts less than half width.
 - 1. Vertical Hems: Provide vertical hems not less than 2 inches wide, with not less than a 1-inch(25-mm) tuck, and machine-sewn with no selvage material visible from front of curtain. Sew open ends of hems closed.
 - 2. Leading Edge Turnbacks: Provide turnbacks formed by folding not less than 12 inches(300 mm) of face fabric back, with not less than a 1-inch(25-mm) tuck, and secured by sewing turnback vertically.
 - 3. Top Hems: Reinforce top hems by double-stitching 3-1/2-inch-(89-mm-) wide, heavy jute webbing to top edge with not less than 2 inches(50 mm) of face fabric turned under.
 - 4. Pleats: Provide 100 percent fullness in curtains, exclusive of turnbacks and hems, by sewing additional material into 6-inch (150-mm) double-stitched box pleats spaced at 12 inches (300 mm) o.c. along top hem reinforcement.
 - 5. Grommets: Brass, centered on box pleats and 1 inch (25 mm) from corner of curtain, for snaps or S-hooks.
 - a. Provide not less than No. 2 grommets except, for velour curtains, provide not less than No. 3 grommets.
 - b. For black curtains, provide brass or aluminum grommets with a black finish.
 - 6. Bottom Hems: For curtains that do not hang to the floor, provide hems not less than 3 inches (75 mm) deep with 3/4-inch (19-mm) weight tape. For floor-length curtains, provide hems not less than 6 inches (150 mm) deep with 1-inch (25-mm) weight tape. Sew open ends of hems closed.
 - 7. Velour Curtains: Fabricate with the fabric nap down.
 - 8. Lining: Provide lining for each curtain in same fullness as face fabric, and finished 2 inches(50 mm) shorter than face fabric. Attach lining to face fabric along bottom and side seams with 4-inch-(100-mm-) long strips of heavy woven cotton tape.

PART 3 - PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for supporting members, blocking, installation tolerances, clearances, and other conditions affecting performance of stage curtain work. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Examine inserts, clips, blocking, or other supports required to be installed by others to support tracks and battens. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION, GENERAL

A. Install stage curtain system according to track manufacturer's and curtain fabricator's written instructions.

3.4 CURTAIN INSTALLATION

- A. Track Hung: Secure curtains to track carriers with track manufacturer's special heavy-duty Shooks or snap hooks.
- B. Batten Hung: Secure curtains to pipe battens with tie lines.

3.5 CONSTRUCTION WASTE MANAGEMENT

A. Comply with the requirements of Section 017400 - CONSTRUCTION WASTE MANAGEMENT for removal and disposal of construction debris and waste.

SECTION 113100 - APPLIANCES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Appliances, Room 615.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Division 22 PLUMBING for water distribution piping connections, drainage and vent piping connections, sinks, and waste disposers.
 - 2. Division 26 ELECTRICAL for services and connections to appliances.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Include operating characteristics, dimensions of individual appliances, and finishes for each appliance.
- B. Appliance Schedule: For appliances; use same designations indicated on Drawings.
- C. Maintenance Data: For each product to include in maintenance manuals.
- D. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.
- B. Source Limitations: Provide products from same manufacturer for each type of appliance required.
- C. Regulatory Requirements: Comply with provisions of the following product certifications:

- 1. NFPA: Provide electrical appliances listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- 2. UL and NEMA: Provide electrical components required as part of residential appliances that are listed and labeled by UL and that comply with applicable NEMA standards.
- 3. ANSI: Provide gas-burning appliances that comply with ANSI Z21 Series standards.
- D. Regulatory Requirements, Accessibility: Where residential appliances are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."
- E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.5 WARRANTY

A. Special Warranties: Manufacturer's standard form in which manufacturer of each appliance specified agrees to repair or replace residential appliances or components that fail in materials or workmanship within manufacturer's standard warranty period.

PART 2 - PRODUCTS

2.1 APPLIANCES

- A. Appliance Schedule:
 - 1. Undercounter Refrigerator: Summit 24" ADA compliant.

a. Model: #AL54CSS

b. Quantity: 1

2. Microwave: GE Profile 1.1 CU.FT.

a. Model: #PEM31SFSS

b. Quantity: 1

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

- B. Examine roughing-in for piping systems to verify actual locations of piping connections before equipment installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Comply with manufacturer's written instructions.
 - 1. Range Hood, Exhaust Fans, and Dryer Vents: Vent directly to the building exterior.
- B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- D. Utilities: Refer to Division 22 PLUMBING for plumbing requirements and Division 26 ELECTRICAL for electrical requirements.

3.3 CLEANING AND PROTECTION

- A. Test each item to verify proper operation. Make necessary adjustments.
- B. Verify that accessories required have been furnished and installed.
- C. Remove packing material from appliances and leave units in clean condition, ready for operation.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train the Owner's maintenance personnel to adjust, operate, and maintain appliances.

SECTION 115210 - PROJECTION SCREENS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Electrically-operated projection screens.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 095100 ACOUSTICAL CEILINGS for coordination with ceiling-recessed units.
 - 2. Division 26 ELECTRICAL for electrical service and connections including metal device boxes for switches and conduit, where required, for low-voltage control wiring.

1.3 SUBMITTALS

- A. Product Data: For each type of screen indicated.
- B. Shop Drawings: Show layouts and types of projection screens. Include the following:
 - 1. Location of screen centerline relative to ends of screen case.
 - 2. Location of wiring connections.
 - 3. Location of seams in viewing surfaces.
 - 4. Drop length.
 - 5. Connections to supporting structure for pendant- and recess-mounted screens.
 - 6. Anchorage details.
 - 7. Details of juncture of exposed surfaces with adjacent finishes.
 - 8. Frame details.
 - 9. Accessories.
 - 10. Wiring Diagrams: For electrically operated units.
- C. Maintenance Data: For projection screens to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver projection screens until building is enclosed and other construction within spaces where screens will be installed is substantially complete and ready for screen installation.
- B. Store rear-projection screens in manufacturer's protective packaging and according to manufacturer's written instructions.

1.6 COORDINATION

A. Coordinate layout and installation of projection screens with adjacent construction, including ceiling framing, light fixtures, HVAC equipment, and partitions.

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, the following:
 - 1. Bretford Manufacturing, Inc.
 - 2. Da-Lite Screen Co., Inc
 - 3. Draper Inc.
 - 4. Stewart Filmscreen.

2.2 FRONT-PROJECTION SCREENS

- A. Electrically Operated Screens: Manufacturer's standard units consisting of case, screen, motor, controls, mounting accessories, and other components necessary for a complete installation. Provide units that are listed and labeled as an assembly by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Line Voltage Control: Remote, 3-position control switch installed in recessed metal device box with flush cover plate matching other electrical device cover plates in room where switch is installed.
 - Motor in Roller: Instant-reversing motor of size and capacity recommended by screen manufacturer; with permanently lubricated ball bearings, automatic thermal-overload protection, preset limit switches to automatically stop screen in up and down positions, and positive-stop action to prevent coasting. Mount motor inside roller with vibration isolators to reduce noise transmission.
 - 3. Screen Mounting: Top edge securely anchored to rigid metal roller and bottom edge formed into a pocket holding a 3/8-inch- diameter metal rod with ends of rod protected by plastic caps.
 - a. Roller for end-mounted motor supported by self-aligning bearings in brackets.
 - b. Roller for motor in roller supported by vibration- and noise-absorbing supports.
- B. Recessed, Electrically Operated Screens with Automatic Ceiling Closure: Motor in roller units designed and fabricated for recessed installation in ceiling; with bottom of case composed of two panels fully enclosing screen, motor, and wiring, one panel hinged and designed to open

and close automatically when screen is lowered and fully raised, the other removable or openable for access to interior of case.

- 1. Provide screen case constructed to be installed with underside flush with ceiling.
- 2. Prime paint surfaces of screen case that will be exposed to view in the finished work.

C. Screen Material and Viewing Surface:

- 1. Matte-White Viewing Surface: Peak gain of 0.9 to 1.0, and gain of not less than 0.8 at an angle of 50 degrees from the axis of the screen surface.
- 2. Mildew Resistance: Rating of 0 or 1 when tested according to ASTM G 21.
- 3. Flame Resistance: Passes NFPA 701.
- 4. Seamless Construction: Provide screens, in sizes indicated, without seams.
- 5. Edge Treatment: Black masking borders.
- 6. Provide extra drop length of dimension indicated to comply with the following requirements for fabric color and location of drop length:
- 7. Size of Viewing Surface: As indicated on the Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install projection screens at locations indicated to comply with screen manufacturer's written instructions.
- B. Install front-projection screens with screen cases in position and in relation to adjoining construction indicated. Securely anchor to supporting substrate in a manner that produces a smoothly operating screen with vertical edges plumb and viewing surface flat when screen is lowered.
 - 1. Install low-voltage controls according to NFPA 70 and manufacturer's written instructions.
 - a. Wiring Method: Install wiring in raceway except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used. Use ULlisted plenum cable in environmental air spaces, including plenum ceilings. Conceal raceway and cables except in unfinished spaces.
 - 2. Test electrically operated units to verify that screen controls, limit switches, closure, and other operating components are in optimum functioning condition.
 - 3. Test manually operated units to verify that screen operating components are in optimum functioning condition.

3.2 PROTECTING AND CLEANING

A. After installation, protect projection screens from damage during construction. If damage occurs despite such protection, remove and replace damaged components or entire unit as required to provide units in their original, undamaged condition.

SECTION 122400 - SHADES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - Roller shades with manual shade operators.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 061000 ROUGH CARPENTRY for wood blocking and grounds for mounting roller shades and accessories.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions.
- B. Shop Drawings: Show location and extent of roller shades. Include elevations, sections, details, and dimensions not shown in Product Data. Show installation details, mountings, attachments to other work, operational clearances, and relationship to adjoining work.
- C. Coordination Drawings: Reflected ceiling 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. Ceiling suspension system members and attachment to building structure.
 - 2. Ceiling-mounted or penetrating items including light fixtures, air outlets and inlets, speakers, sprinklers, recessed shades, and special moldings at walls, column penetrations, and other junctures of acoustical ceilings with adjoining construction.
 - 3. Shade mounting assembly and attachment.
 - 4. Size and location of access to shade operator and adjustable components.
 - 5. Minimum Drawing Scale: 1/4 inch = 1 foot.
- D. Samples for Initial Selection: For each colored component of each type of shade indicated.
 - 1. Include similar Samples of accessories involving color selection.
- E. Samples for Verification:

- Complete, full-size operating unit not less than 16 inches wide for each type of roller shade indicated.
- 2. For the following products:
 - a. Shade Material: Not less than 12-inch- square section of fabric, from dye lot used for the Work, with specified treatments applied. Show complete pattern repeat. Mark top and face of material.
 - b. Valance: Full-size unit, not less than 12 inches long.
- F. Window Treatment Schedule: For roller shades. Use same designations indicated on Drawings.
- G. Product Certificates: For each type of roller shade, signed by product manufacturer.
- H. Qualification Data: For Installer.
- I. Product Test Reports: For each type of roller shade.
- J. Maintenance Data: For roller shades to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining roller shades and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.
 - 3. Operating hardware.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Source Limitations: Obtain roller shades through one source from a single manufacturer.
- C. Fire-Test-Response Characteristics: Provide roller shade band materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. Flame-Resistance Ratings: Passes NFPA 701.
- D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in factory packages, marked with manufacturer and product name, fire-testresponse characteristics, and location of installation using same designations indicated on Drawings and in a window treatment schedule.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install roller shades until construction and wet and dirty finish work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operable glazed units' operation hardware throughout the entire operating range. Notify Architect of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.7 EXTRA MATERIALS

- 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. Rollers Shades: Before installation begins, for each size, color, texture, and pattern indicated, full-size units equal to 5 percent of amount installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Draper Inc.
 - 2. Hunter Douglas Contract; Nysan Shading Systems.
- B. Basis of Design: MechoShade Systems, Inc.; Mech 5 Soho Collection.

2.2 ROLLER SHADES

- A. Shadecloth: Transparent (1% or greater), 100% polyester or PLA biopolymer fabric, PVC-free.
 - 1. Color: #1103 Light Grey.
 - Fire-Test-Response Characteristics: Passes NFPA 701, with no chemical flame retardants.
 - 3. Building Product Disclosure and Optimization, Material Ingredients: Cradle to Cradle (C2C) Gold certification.
 - 4. Low-Emitting Materials: Provide adhesives and sealants in compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - a. GreenGuard Gold certification.
 - 5. Bottom Hem: Straight.
 - 6. Colors: To be selected by Architect from manufacturer's full range.

- B. Rollers: Electrogalvanized or epoxy primed steel or extruded-aluminum tube of diameter and wall thickness required to support and fit internal components of operating system and the weight and width of shade band material without sagging; designed to be easily removable from support brackets; with removable spline fitting integral channel in tube for attaching shade material.
 - 1. Direction of Roll: Regular, from back of roller
- C. Mounting Brackets: Galvanized or zinc-plated steel.
- D. Fascia: L-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; continuous panel concealing front and bottom of shade roller, brackets, and operating hardware and operators; length as indicated on Drawings removable design for access.
- E. Top/Back Cover: L-shaped; material and finish to match fascia; combining with fascia and end caps to form a six-sided headbox enclosure sized to fit shade roller and operating hardware inside.
- F. Pocket-Style Headbox: U-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; with a bottom cover consisting of slot opening of minimum dimension to allow lowering and raising of shade and a removable or an openable, continuous metal access panel concealing shade roller, brackets, and operating hardware and operators within.
- G. Bottom Bar: Steel or extruded aluminum. Provide concealed, by pocket of shade material, internal-type bottom bar with concealed weight bar as required for smooth, properly balanced shade operation.
- H. Mounting: As indicated on Drawings, mounting permitting easy removal and replacement without damaging roller shade or adjacent surfaces and finishes.
- I. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard for anchoring roller shade bottom in place and keeping shade band material taut.

2.3 ROLLER SHADE FABRICATION

- A. Product Description: Roller shade consisting of a roller, a means of supporting the roller, a flexible sheet or band of material carried by the roller, a means of attaching the material to the roller, a bottom bar, and an operating mechanism that lifts and lowers the shade.
- B. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.
 - 1. Lifting Mechanism: With permanently lubricated moving parts.
- C. Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 74 deg F:
 - 1. Shade Units Installed between (Inside) Jambs: Edge of shade not more than 1/4 inch from face of jamb. Length equal to head to sill dimension of opening in which each shade is installed.
 - 2. Shade Units Installed Outside Jambs: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

- D. Installation Brackets: Designed for easy removal and reinstallation of shade, for supporting fascia, roller, and operating hardware and for hardware position and shade mounting method indicated.
- E. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to shade hardware and adjoining construction; type designed for securing to supporting substrate; and supporting shades and accessories under conditions of normal use.
- F. Color-Coated Finish: For metal components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.

2.4 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS

- A. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.
 - Bead Chains: Manufacturer's standard.
 - a. Loop Length: Full length of roller shade.
 - b. Limit Stops: Provide upper and lower ball stops.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER SHADE INSTALLATION

A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions, and located so shade band is not closer than 2 inches to interior face of glass. Allow clearances for window operation hardware.

3.3 ADJUSTING

A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

- A. Clean roller shade surfaces after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.

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C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

SECTION 124810 - ENTRANCE FLOOR MATS AND FRAMES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Carpet-type matting.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Samples for Verification: For each type of product indicated.
 - 1. Floor Mat: 12-inch- square, assembled sections of floor mat.
 - 2. Frame Members: 12-inch- long Sample of each type and color.
- C. Maintenance Data: For floor mat and frames to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain floor mats and frames through one source from a single manufacturer.
- B. Accessibility Requirements: Provide installed floor mats that comply with Section 4.5 in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)".

1.5 PROJECT CONDITIONS

A. Field Measurements: Indicate measurements on Shop Drawings.

1.6 COORDINATION

A. Coordinate size and location of recesses in concrete with installation of finish floors to receive floor mats and frames.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Carpet-Type Matting:
 - a. AFCO-USA.
 - b. Mats Inc.
 - c. Milliken.
 - d. Nystrom.
 - e. Shaw Contract.
 - f. Tennessee Mat Company, Inc.
- B. Basis of Design: Mats Inc, Berber tile 100% solution dyed, UV stabilized polypropylene fiber.
 - 1. Backing: High Density Rubber.
 - 2. Format: 19-11/16"x19-11/16" x3/8" thick.
 - 3. Weight 129.8oz/sq yd.
 - 4. Color: Charcoal.

2.2 FLOOR MATS

- A. General: Provide colors, patterns, and profiles of materials, including metals and metal finishes indicated or specified. If not indicated, provide colors, patterns, and profiles selected by Architect from manufacturer's standards.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated.
 - Low-Emitting Materials: Provide adhesives and sealants in compliance with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - 2. VOC Content: 50 g/L or less.
 - 3. Do not use adhesives that contain urea formaldehyde.
 - 4. Methylene chloride and perchloroethylene may not be intentionally added to adhesives and sealants.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrate for compliance with requirements for location, sizes, minimum recess depth, and other conditions affecting installation of floor mats and frames.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install mats to comply with manufacturer's written instructions. Set mat tops at height recommended by manufacturer for most effective cleaning action; coordinate top of mat surfaces with bottom of doors that swing across mats to provide clearance between door and mat.

3.3 PROTECTION

A. Defer installation of floor mats until Project is near Substantial Completion.

SECTION 126100 - REFURBISHING FIXED AUDIENCE SEATING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.
- B. Examine all other Sections of the Specifications for requirements that affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Refurbishing existing fixed audience seating including but not limited to the following:
 - a. Removal of existing seating including stanchions, seat backs, seats, tablet arms, arm rests, anchors, and all other accessories and components.
 - b. Off-site surface preparation of all components including paint removal, prime coat and finish coatings.
 - c. Adjustment and repair of operating mechanisms for seats and tablet arms.
 - d. Reupholstering seats including replacement of foam seat cushions and fabric.
 - e. Cleaning all components including seat backs.
 - f. Installation of refurbished seating.
 - g. Modifications to existing seating and seating configuration to comply with ADA requirements.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for refurbishing fixed audience seating.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Seating Layout: Show seating layout, aisle widths, row-lettering and chair-numbering scheme, chair widths, and chair spacing in each row.
 - 2. Accessories: Show accessories, including locations of left- and right-hand tablet arms, electrical devices, accessibility provisions, and attachments to other work.
 - 3. Wiring Diagrams: For power, signal, and control wiring.
- C. Samples for Verification: Two standard size units, showing aisle and connection.
- D. Product Certificates: For each type of flame-retardant treatment of fabric, from manufacturer.

- E. Field quality-control reports.
- F. Maintenance Data: For fixed audience seating to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining upholstery fabric.
 - 2. Precautions for cleaning materials and methods that could be detrimental to seating finishes and performance.
- G. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of seating required, including accessories and mounting components, from single source from single manufacturer.
 - 1. Upholstery Fabric: Obtain fabric of a single dye lot for each color and pattern of fabric required.
- B. Fire-Test-Response Characteristics of Upholstered Chairs:
 - 1. Fabric: Class 1 according to DOC CS 191 and 16 CFR 1610.61, tested according to California Technical Bulletin 117.
 - 2. Padding: Comply with California Technical Bulletin 117.
 - 3. Full-Scale Fire Test: Comply with California Technical Bulletin 133.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. Mock-up: Provide mock-up of one refurbished seat for Owner and Architect approval prior to proceeding with remainder.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install seating until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary or permanent HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Verify actual dimensions of seating layout and construction contiguous with seating by field measurements before fabrication.

1.6 COORDINATION

- A. Coordinate layout and installation of electrical wiring and devices with seating layout to ensure that floor junction boxes for electrical devices are accurately located to allow connection without exposed conduit.
 - Coordinate wiring and power receptacles installed in seating with requirements in Division 26 Sections.
 - Coordinate wiring and data ports installed in seating with requirements in Division 16 Sections.

B. Coordinate layout and installation of diffuser pedestals with HVAC work and with properties of diffuser pedestals to ensure alignment, proper air diffusion, and correct seat locations.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of fixed audience seating that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including standards, beams, and pedestals.
 - b. Wear and deterioration of fabric and stitching beyond normal use.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
 - 2. Warranty Periods: As follows, from date of Substantial Completion.
 - Structural: 10 years.
 - b. Plastic, Wood, and Paint Components: Five years.

PART 2 - PRODUCTS

2.1 MATERIALS AND FINISHES

- A. Provide materials, accessories, and components necessary to refurbish existing fixed audience seating.
- B. Manufacturers: Baker Road Seating and Restoration, American Seating, or approved equal.
- C. Standards cast iron or steel construction.
- D. Floor mounted chairs: Attachment to floor with anchors into cast-in-place concrete floor.
- E. Arms: Wood, solid Maple select grain, stained finish.
- F. Chair Shell: Outer back shell plastic one-piece construction of high density polyethylene, color as selected by Architect from manufacturer's standard colors.
- G. Seats: Self-rising, spring action or counter balancing.
- H. Fabric: Absecon Mills, Shire Tuscan Blue.
- I. Plastic laminate complying with NEMA-LD-3-GP50. Color selected by Architect from any of the following manufacturer's standard patterns and colors: Formica, Nevamar or Wilsonart.
- J. Padding material: High resilient polyurethane foam conforming to CBHB Bulletin C-117-75, thickness per manufacturer's specifications.
- K. Row/Seat Designation Plates: Gold rectangular aluminum letter/number plates mounted on front edge of seat. Row letters to be placed on end armrests.

L. Extra Material: Furnish 10 yards of rolled upholstery fabric marked and labeled for Owners use.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine floors, risers, and other adjacent work and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with refurbishment only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install seating in locations indicated and fastened securely to substrates according to manufacturer's written installation instructions.
 - 1. Use installation methods and fasteners that produce fixed audience seating assemblies with individual chairs capable of supporting an evenly distributed 600-lb static load without failure or other conditions that might impair the chair's usefulness.
 - 2. Install standards and pedestals plumb.
- B. Install seating with chair end standards aligned from first to last row and with backs and seats varied in width and spacing to optimize sightlines.
- C. Install riser-mounted attachments to maintain uniform chair heights above floor.
- D. Install chairs in curved rows at a smooth radius.
- E. Install seating so moving components operate smoothly and quietly.
- F. Install wiring conductors and cables concealed in components of seating and accessible for servicing.

3.3 FIELD QUALITY CONTROL

- A. 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.
 - 2. Tests for Power Receptacles: As specified in Division 16 Sections.
 - 3. Tests for Data Ports: As specified in Division 16 Sections.
- B. Prepare test and inspection reports.

3.4 ADJUSTING

- A. Adjust chair backs so that they are aligned with each other.
- B. Adjust self-rising seat mechanisms so seats in each row are aligned when in upright position.
- C. Verify that all components and devices are operating properly.

- D. Verify that seating returns to correct at-rest position.
- E. Repair minor abrasions and imperfections in finishes with coating that matches factory-applied finish.
- F. Replace upholstery fabric damaged during installation.

SECTION 142600 - LIMITED-USE/LIMITED-APPLICATION ELEVATORS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Limited-use/limited-application (LU/LA) elevators.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 033000 CAST-IN-PLACE CONCRETE for setting sleeves, inserts, and anchoring devices in concrete.
 - 2. Section 042000 UNIT MASONRY for setting sleeves, inserts, and anchoring devices in masonry.
 - 3. Section 051200 STRUCTURAL STEEL FRAMING for attachment plates, angle brackets, and other preparation of structural steel for fastening guide-rail brackets.
 - 4. Section 099000 PAINTING AND COATING for field painting of hoistway entrance doors and frames.

1.3 DEFINITIONS

- A. Definitions in ASME A17.1/CSA B44 apply to Work of this Section.
- B. LU/LA: Limited use/limited application.

1.4 SUBMITTALS

A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include Product Data for car enclosures, hoistway entrances, and operation, control, and signal equipment.

B. Shop Drawings:

- 1. Include plans, elevations, sections, and large-scale details indicating service at each landing, machine room layout, coordination with building structure, relationships with other construction, and locations of equipment.
- 2. Indicate loads imposed on building structure at points of support and power requirements.
- C. Samples for Initial Selection: For finishes involving color selection.

- D. Samples for Verification: For exposed car finishes, hoistway doors, and frames; 3-inch- square Samples.
- E. Qualification Data: For Installer.
- F. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service, as shown and specified, are adequate for elevator being provided.
- G. Preinstallation Examination Report: Indicating dimensional discrepancies and conditions detrimental to performance or indicating that dimensions and conditions were found to be satisfactory.
- H. Sample Warranty: For special warranty.
- I. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals.
- J. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction, for normal, unrestricted elevator use.
- K. Continuing Maintenance Proposal: Provide a continuing maintenance proposal from Installer to Owner, in the form of a standard one-year maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Elevator manufacturer or an authorized representative who is trained and approved by manufacturer.
- B. Regulatory Requirements: Comply with ASME A17.1/CSA B44 and applicable local Elevator Code.
- C. Accessibility Requirements: Comply with Section 408 in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and applicable local codes.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle materials, components and equipment in manufacturer's protective packaging. Store materials, components, and equipment off of ground, under cover, and in a dry location.

1.7 COORDINATION

- A. Coordinate installation of sleeves, block outs, and items that are embedded in concrete or masonry for elevator equipment. Furnish templates and installation instructions and deliver to Project site in time for installation.
- B. Coordinate locations and dimensions of other work relating to LU/LA elevators including sumps and floor drains in pits; entrance subsills; electrical service; and electrical outlets, lights, and switches in hoistways, pits, and machine rooms.

1.8 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair, restore, or replace elevator work that fails in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.
 - 2. Warranty Period: 10 years 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. American Crescent Elevator Mfg., Corp.
 - 2. Cemcolift, Inc.
 - 3. Federal Elevator Inc.
 - 4. Liftavator, Inc.
 - 5. National Wheel-O-Vator; a division of ThyssenKrupp Access.
 - 6. Nationwide Lifts, Inc.
 - 7. Savaria Concord Lifts.
 - 8. Schumacher Elevator Company.

2.2 SYSTEMS AND COMPONENTS

- A. Elevator System, General: Manufacturer's standard LU/LA elevator. Unless otherwise indicated, manufacturers' standard components shall be used, as included in standard LU/LA elevators and as required for complete system.
 - 1. Rated Load: 1500 lb.
 - 2. Rated Speed: 40 fpm.
- B. Machine Type: Hydraulic, holeless, beside the car; direct-acting hydraulic or roped hydraulic.
- C. Pump Units: Positive-displacement type with a maximum of 10 percent variation between no load and full load and with minimum pulsations.
 - 1. Pump shall be submersible type, suspended inside oil tank from vibration isolation mounts.
 - 2. Motor shall have solid-state starting or variable-voltage, variable-frequency motor control.
 - 3. System shall have hydraulic silencer and flexible piping connectors at pump unit.
- D. Hydraulic Fluid: Elevator manufacturer's standard fluid with additives as needed to prevent oxidation of fluid, corrosion of cylinder and other components, and other adverse effects.

E. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work. Device installation is specified in another Section.

2.3 OPERATION SYSTEMS

- A. General: Provide manufacturer's standard microprocessor operation system.
- B. Battery-Powered Lowering: When power fails, car is lowered to the lowest floor, opens its car and hoistway doors, and shuts down. System includes rechargeable battery and automatic recharging system.
- C. Emergency Operation: None required.
- D. Keyswitch Operation: Push buttons are activated and deactivated by security keyswitch. Key is removable only in deactivated position.

2.4 DOOR REOPENING DEVICES

A. Infrared Array: Provide door-reopening devices with a uniform array of 36 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more light beams shall cause doors to stop and reopen.

2.5 CAR ENCLOSURES

- A. General: Provide steel-framed car enclosures with wall panels, car roof, access doors, power door operators, and ventilation. Provide finished car including materials and finishes specified below.
- B. Clear Inside Dimensions: As indicated on Drawings.
- C. Materials and Finishes: Manufacturer's standards, but not less than the following:
 - 1. Floor Finish: Elevator manufacturer's standard level-loop nylon carpet; color as selected by Architect from manufacturer's full range.
 - 2. Wall Panels: Elevator manufacturer's standard raised Oak veneer panels; with trim fabricated from brass sheet with polished finish.
 - 3. Sills: Extruded aluminum, with grooved surface, 1/4 inch thick.
 - 4. Metal Ceiling: Flush panels, fabricated from brass sheet with polished finish.
 - 5. Lighting: Not less than two LED downlights. Provide battery backup power source with automatic charging.
 - 6. Handrail: 1-1/2 inches round, polished brass finish, located at rear of car.
- D. Car Doors: Manufacturer's standard units complete with track systems, hardware, sills, and accessories.
 - 1. Operation: Power-operated, automatic.
 - 2. Type: Horizontal sliding.
 - 3. Clear Opening Width: 36 inches.
 - 4. Door Height: 84 inches.
 - 5. Brass Doors: Flush, hollow-metal construction; fabricated from polished brass sheet.

2.6 HOISTWAY ENTRANCES

- A. General: Provide manufacturer's standard door-and-frame hoistway entrances, same size as car doors, complete with track systems, hardware, sills, and accessories.
 - 1. Operation: Power-operated, automatic.
 - 2. Type: Horizontal sliding.
- B. Coordinate frame size and profile with hoistway wall construction.
 - 1. Where gypsum board wall construction is indicated, provide self-supporting frames with reinforced head sections.
- C. Materials and Fabrication: Manufacturer's standards, but not less than the following:
 - 1. Brass Frames: Formed from brass sheet; polished finish.
 - 2. Sills: Extruded aluminum, with grooved surface, 1/4 inch thick.
 - Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M.
- D. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies shall comply with NFPA 80 and be listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction based on testing at as-close-to-neutral pressure as possible according to NFPA 252 or UL 10B.
 - 1. Fire-Protection Rating: As indicated on Drawings.

2.7 SIGNAL EQUIPMENT

- A. General: Provide hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Fabricate lighted elements with LEDs.
 - 1. Finish: Polished brass.
- B. Car-Control Stations: Provide manufacturer's standard car-control stations. Mount in side panel adjacent to car door unless otherwise indicated.
 - 1. Mark buttons and switches for function. Use both tactile symbols and Braille.
 - 2. Provide "No Smoking" sign matching car-control station, either integral with car-control station or mounted adjacent to it, with text and graphics as required by authorities having jurisdiction.
- C. Emergency Communication System: Two-way voice communication system, with visible signal, which dials preprogrammed number of monitoring station and does not require handset use. System is contained in flush-mounted cabinet, with identification, instructions for use, and battery backup power supply.
- D. Car Position Indicator: Provide digital-type position indicator in elevator car. Also, provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served. Include travel direction arrows if not provided in car-control station.
- E. Hall Push-Button Stations: and for indicating desired direction of travel where applicable. Provide manufacturer's standard wall-mounted units, equipped with buttons for calling elevator

- F. Hall Lanterns: Units with illuminated arrows; but provide single arrow at terminal landings.
- G. Hall Annunciator: With each hall lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.
 - 1. At manufacturer's option, audible signals may be placed on car.
- H. Emergency Pictorial Signs: Fabricate from materials matching hall push-button stations, with text and graphics as required by authorities having jurisdiction, indicating that in case of fire, elevators are out of service and exits should be used instead. Provide one sign at each hall push-button station unless otherwise indicated.

2.8 FINISH MATERIALS

- A. General: Provide the following materials for exposed parts of elevator car enclosures, car doors, hoistway entrance doors and frames, and signal equipment as indicated.
- B. Brass Sheet: ASTM B 36, Alloy UNS No. C26000 (cartridge brass, 70 percent copper).
- C. Wood Species and Cuts: White Oak, quarter sawn.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine elevator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Verify critical dimensions and examine supporting structure and other conditions under which elevator work is to be installed.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install cylinder plumb and accurately located for elevator car position and travel. Anchor securely in place, supported at pit floor and braced at intervals as needed to maintain alignment. Anchor cylinder guides at spacing needed to maintain alignment and avoid overstressing guides.
- B. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts to minimize vibration transmission to structure and structure-borne noise from elevator system.
- C. Lubricate operating parts of systems as recommended by manufacturers.
- D. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with car. Reduce clearances to minimum, safe, workable dimension at each landing.
- E. Leveling Tolerance: 1/4 inch, up or down, regardless of load and direction of travel.

- F. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.
- G. Locate hall lanterns either above or beside hoistway entrance at a minimum of 72 inches above finished floor unless hall lanterns are built into entrance frames.

3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of elevator installation and before permitting elevator use, perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by authorities having jurisdiction.
- B. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times that tests are to be performed.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner to operate elevator(s).
- B. Check operation of elevator with Owner present before date of Substantial Completion. Determine that operation systems and devices are functioning properly.

3.5 MAINTENANCE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
 - 1. Perform maintenance during normal working hours.
 - 2. Perform emergency callback service during normal working hours with response time of two hours or less.